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UNITED STATES COAST PILOT

ATLANTIC COAST

PART VI.

CHESAPEAKE BAY AND TRIBUTARIES

VK
981
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1st ed.
(1889)

FIRST EDITION

PRICE $1.00

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UNITED STATES

COAST AND GEODETIC SURVEY OFFICE,

WASHINGTON, D. C., *November 11, 1889.*

This volume covers Chesapeake Bay and its tributaries. It has been prepared as part of a large volume, now in preparation, which is designed to embrace the Atlantic coast of the United States. This part is now issued separately to meet the demand for a Coast Pilot covering the section of coast included herein; in the present issue some matters are treated more in detail than would be practicable in the larger volume.

This publication is based mainly upon the work of the Coast and Geodetic Survey, including the results of special examinations and investigations by Lieut. G. H. Peters, U. S. N., in the summer of 1886.

The system adopted in this publication 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 sections or 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 1889, by Ensign E. H. Tillman, U. S. N., and Mr. John Ross, the work being under the general direction of Lieut.-Com'dr Willard H. Brownson, U. S. N., Lieut.-Com'dr C. M. Thomas, U. S. N., Hydrographic Inspectors, Coast and Geodetic Survey.

In matter of general arrangement, the plan formulated by Lieut. G. H. Peters, U. S. N., Assistant, Coast and Geodetic Survey, has been followed. Before final adoption, the merit of this plan was demonstrated by the responses received from a number of experts to whom it was submitted for criticism and suggestions.

The views which were originally drawn by the late Mr. John R. Barker, have been corrected to 1886.

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

The aids to navigation are corrected to November 11, 1889.

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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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.

SYSTEM OF BUOYAGE ADOPTED IN UNITED STATES WATERS.

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

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

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

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

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

All other distinguishing marks to buoys will be in addition to the foregoing, and may be employed to mark particular spots; *a description of such special marks 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.

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

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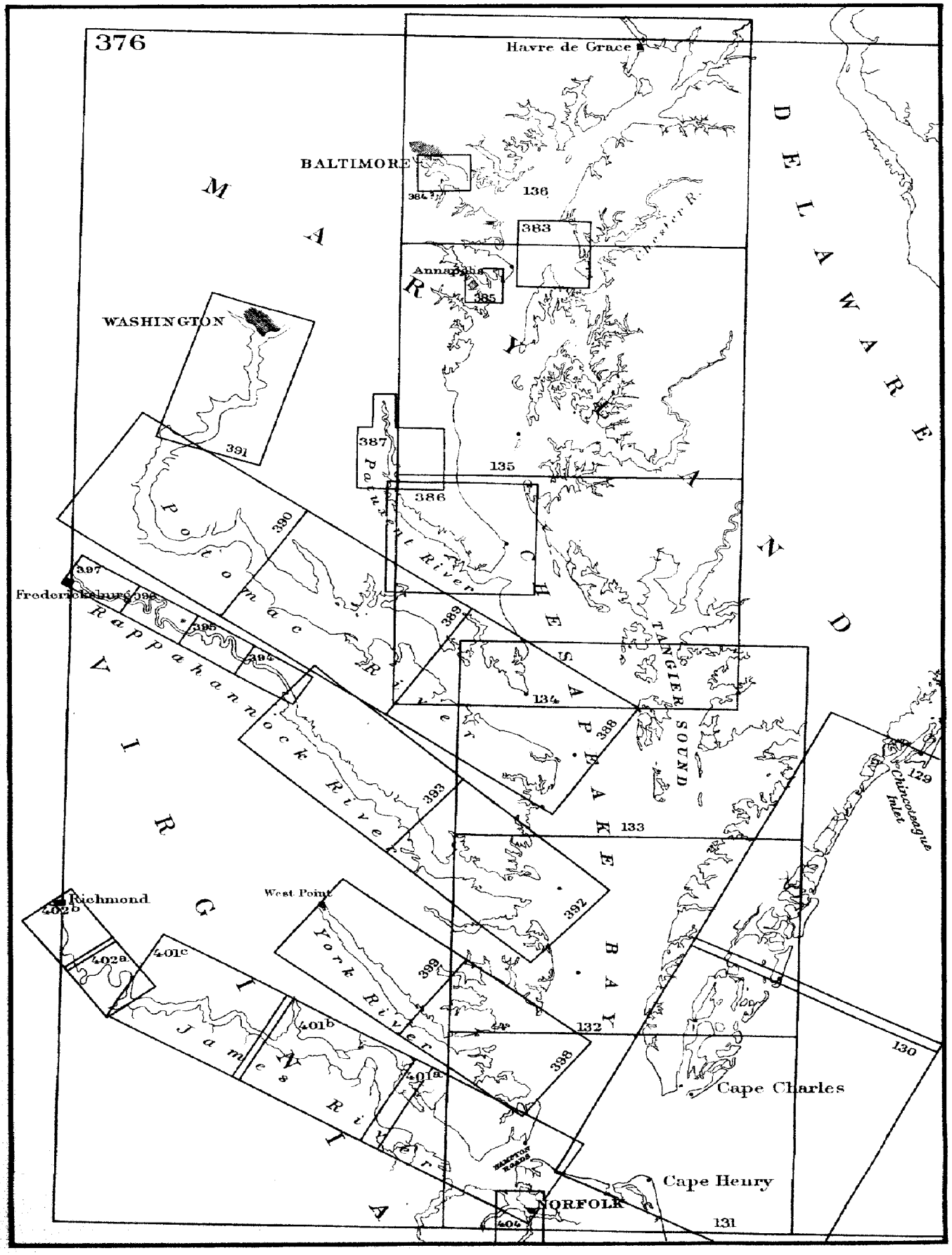
376
Havre de Grace
BALTIMORE
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Chester R.
Annapolis
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WASHINGTON
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Patuxent River
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Potomac River
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Fredericksburg
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TANGIER SOUND
CHESAPEAKE BAY
Rappahannock River
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133
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Chincoteague Inlet
Richmond
402b
West Point
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402a
401c
York River
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401b
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James River
401a
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Cape Charles
HAMPTON ROADS
Cape Henry
NORFOLK
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MARYLAND
DELAWARE
VIRGINIA

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GENERAL OUTLINE OF ARRANGEMENT.

The order in which Chesapeake Bay and its tributaries have been treated in this volume is:—

1. Chesapeake Bay as a whole; tables of, light-houses, tide and current stations, signal-service stations, life-saving stations, bearings and distances, and variation of the compass; and sailing directions in sections from the sea to the mouth of the Patapsco River (Baltimore Harbor Entrance).

2. The tributaries and ports in the western shore of Chesapeake Bay, with sailing directions, in detail, from Hampton Roads to and including Baltimore Harbor.

3. The tributaries and ports in the eastern shore of Chesapeake Bay, with sailing directions, in detail, from Cape Charles to and including Chester River.

4. The head and tributaries of Chesapeake Bay above the mouth of the Patapsco, with sailing directions in detail.

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 in which they would be required in practice, and when given for more than one approach or channel, a letter is added to the numeral, thus: "Approaching Potomac River Entrance, Sec. 1, From the Southward; Sec. 1 A, From the Northward." When directions for vessels of certain draught or for minor channels are given in the same section, they are put in separate paragraphs distinguished by Roman numerals.

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

Entering Chesapeake Bay from sea, the general rule followed in U. S. Coast Pilot, designed to embrace the Atlantic Coast of the United States in one volume, which is now in preparation, has been retained, *i. e.*, the approach from the northward or eastward is numbered 1, and from the southward or westward 1 A.

Entering the tributaries of Chesapeake Bay, the natural approach from seaward (from the southward) is numbered 1, and from the northward 1 A.

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

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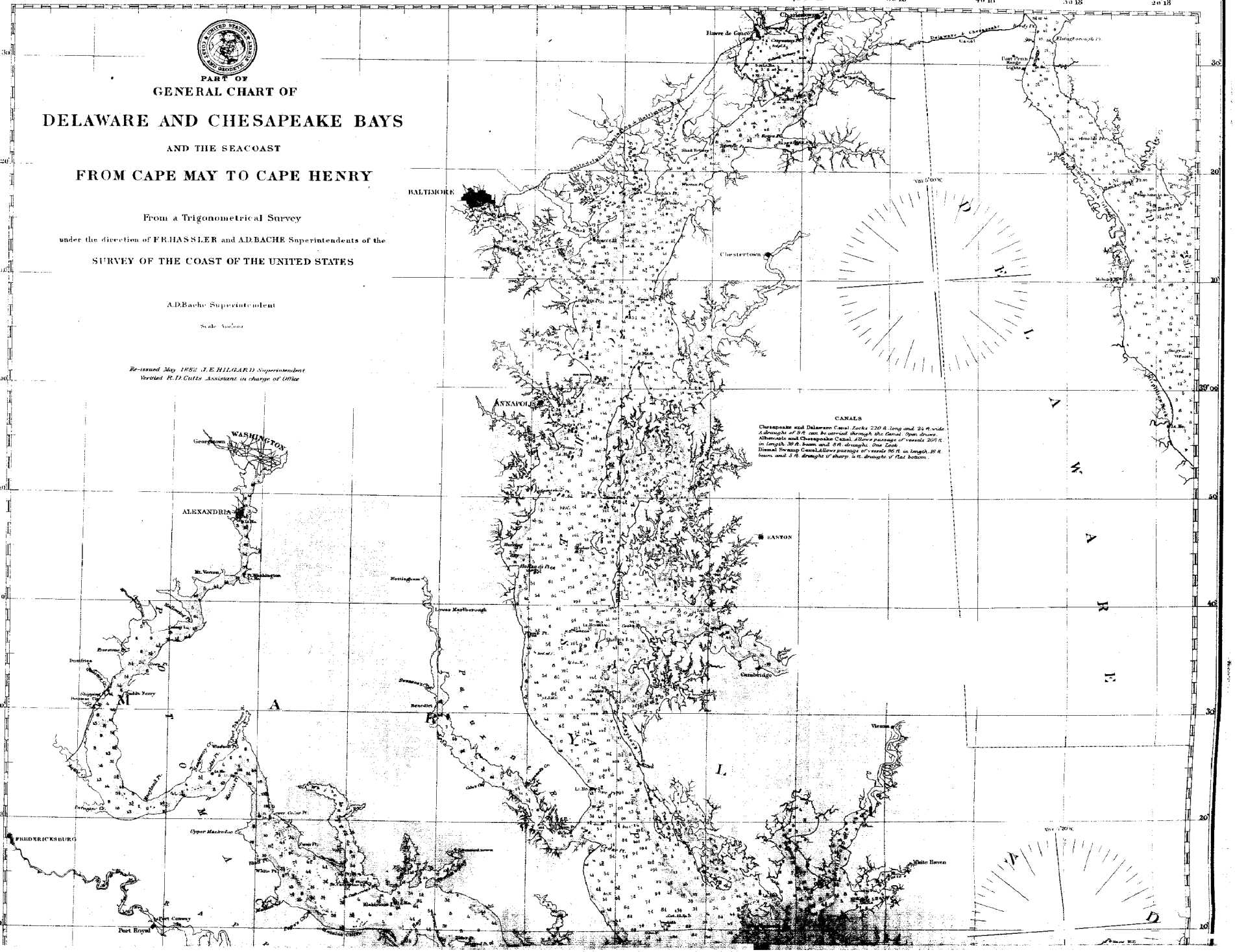
PART OF
GENERAL CHART OF
DELAWARE AND CHESAPEAKE BAYS
AND THE SEACOAST
FROM CAPE MAY TO CAPE HENRY
From a Trigonometrical Survey
under the direction of F.R.HASSLER and A.D.BACHE Superintendents of the
SURVEY OF THE COAST OF THE UNITED STATES
A.D.Bache Superintendent
Re-issued May 1882 J.E.HILGARD Superintendent
Verified R.D.Cutts Assistant in charge of Office
CANALS
Chesapeake and Delaware Canal. Locks 220 ft. long and 24 ft. wide. A draught of 9 ft. can be carried through the Canal. Open draw.
Albemarle and Chesapeake Canal. Allows passage of vessels 208 ft. in length, 39 ft. beam and 8 ft. draught. One Lock.
Dismal Swamp Canal. Allows passage of vessels 96 ft. in length, 16 ft. beam and 5 ft. draught if sharp, 4 ft. draught if flat bottom.
BALTIMORE
ANNAPOLIS
WASHINGTON
ALEXANDRIA
FREDERICKSBURG
EASTON
Chestertown
Havre de Grace
Cambridge
Vienna
White Haven
Port Royal
Nottingham
Lower Marlborough
Benedict
Upper Machodoc Cr.
Mt. Vernon
Georgetown
Port Penn
Delaware & Chesapeake Canal
Chesapeake & Delaware Canal
Patuxent R.
Potomac R.
Rappahannock R.
Choptank R.
Elsinborough Pt.
Shad Roads
Warren Pt.
Holland's Pt.
Sharp Pt.
Hollands Cove
Dunfries
Occoquan
Quantico
Nanjemoy
Port Conway
White Pt.
Kinsale
Lower Cedar Pt.
Upper Cedar Pt.
Mt. Vernon
Washington
Alexandria
Georgetown
Chesapeake
Delaware
Bay
Var. 5°00' W.
Var. 4°20' W.
20'18"
10'18"
77°00'18"
50'18"
40'18"
30'18"
20'18"
10'18"
76°00'18"
50'18"
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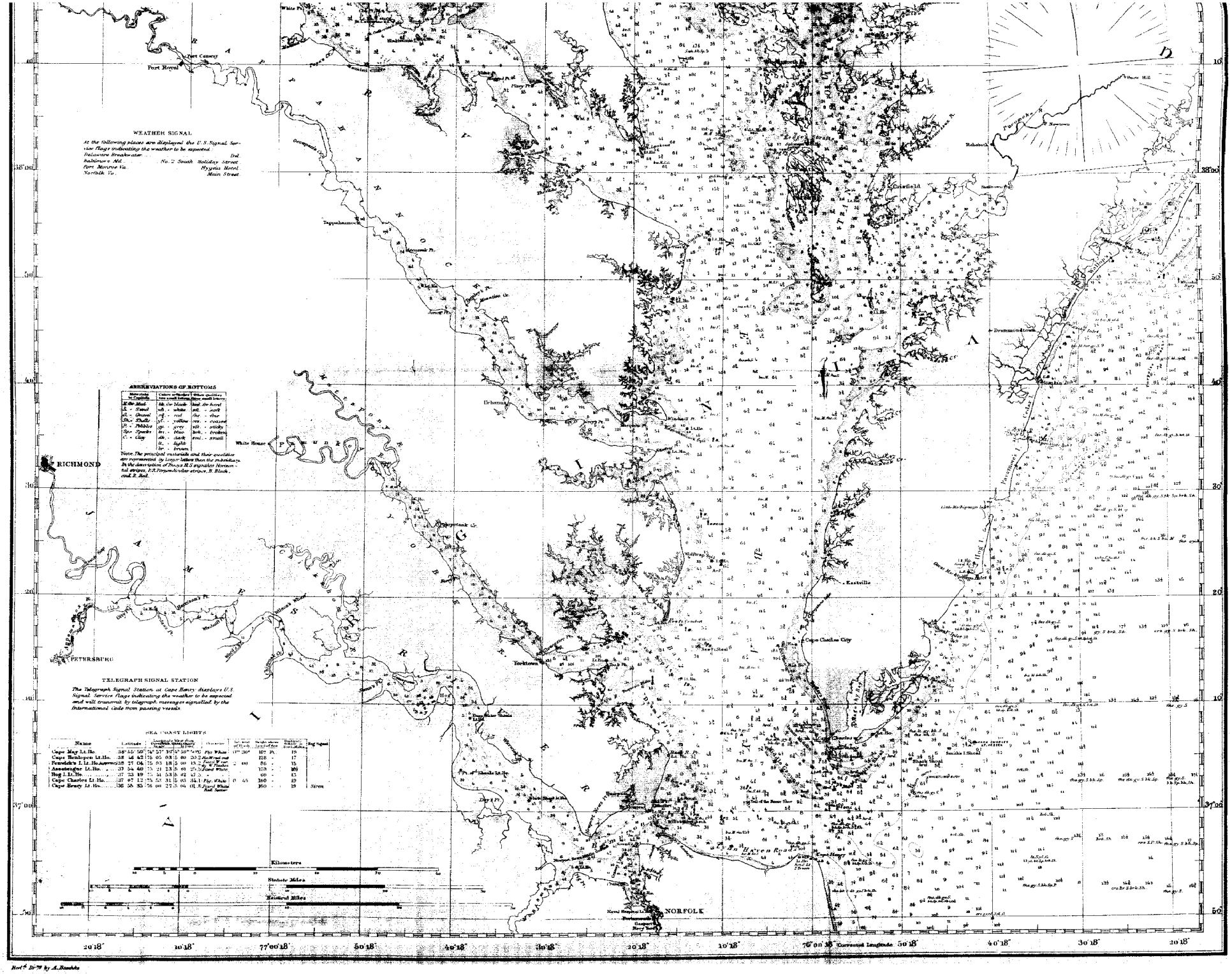

WEATHER SIGNAL
At the following places are displayed the U.S. Signal Service flags indicating the weather to be expected.
Delaware Breakwater ... Del.
Baltimore Md. ... No. 2 South Holiday Street.
Fort Monroe Va. ... Hygeia Hotel.
Norfolk Va. ... Main Street.
ABBREVIATIONS OF BOTTOMS
Note. The principal materials and their qualities are represented by larger letters than the subsidiary. In the description of Buoys H.S signifies Horizontal stripes, P.S. Perpendicular stripes, B. Black, and R. Red.
TELEGRAPH SIGNAL STATION
The Telegraph Signal Station at Cape Henry displays U.S. Signal Service flags indicating the weather to be expected and will transmit by telegraph messages signalled by the International Code from passing vessels.
SEA COAST LIGHTS
Kilometers
Statute Miles
Nautical Miles
RICHMOND
PETERSBURG
NORFOLK
Port Royal
Port Conway
Tappahannock
Urbanna
White House
Yorktown
Cape Charles City
Eastville
Drummondtown
Crisfield
Newtown
Rehoboth
Smiths I. Shoal
Cape Henry
Cape Henry Roads
Hog I.
Hog Island
Corrected Longitude
Reef. Dr. by A. Boschke

View of Cape Charles from the Eastward, the Lt.Ho. bearing NW, distant 5 Miles.

View of Cape Henry from the Eastward, the Lt.Ho. bearing W. by S, distant 5 Miles.

UNITED STATES COAST PILOT.

ATLANTIC COAST—PART VI.

CHESAPEAKE BAY AND TRIBUTARIES.

CHESAPEAKE BAY.†

Chesapeake Bay is the largest bay on the Atlantic seaboard of the United States. **The entrance**, in latitude **37° 00′ N.** and longitude **75° 59′ W.**, between Cape Charles on the north and Cape Henry on the south, is about 10 miles wide, but the shoals extending to the southward off Cape Charles leave an available width of about 5 miles for deep-draught vessels.

The whole of the northern point of entrance to Chesapeake Bay is generally known as **Cape Charles**; this includes **Smith's Island**, a long, low, partly wooded island on the eastern side of the cape, on which is Cape Charles Light-house; **The Isaacs**, a low, irregular-shaped, sandy island, the southernmost point of the cape; and **Fisherman's Island**, a low sandy island, with several buildings (**National Quarantine Station**), which lies between The Isaacs and the mainland on the western side of the cape. **Cape Charles** proper is a low sandy point, the southernmost point of the mainland, on the eastern side of Chesapeake Bay, and just to the northward of Fisherman's Island, from which it is separated by a shallow passage called Fisherman's Inlet.

Smith's Island may be seen from quite a distance; it is marked by **Cape Charles Light-house** (see table of light-houses), which, seen from the eastward, is backed by heavy woods. The sea-coast from Cape Charles to Fenwick's Island Light-house, a distance of 93 miles, has a general **NE.** by **N.** trend, and is low, with small sand hillocks. Just back of the sand beach are shallow bodies of water or marsh, and farther to the rear are dense low woods. Between Cape Charles and Assateague Light-house (about 55 miles **NE.** by **N.**) the shore-line is broken by a number of small, shallow, unimportant inlets.

Cape Henry, when seen from seaward, presents a bold range of sand hills, which by their unusual height (80 feet) and bold surfaces show very conspicuously from a long distance. Opposite the pitch of the cape the crest of this range is half a mile from high water, the intervening space being filled by a cluster of lower sand hills, diminishing gradually in height to the smooth flat beach bordering the coast-line. On this beach, and less than ¼ mile from the water, is **Cape Henry Light-house** (see table of lights and view). Near the light-house is a **U. S. Signal Service and Sea-coast telegraph station**, from which wind signals are displayed, and with which vessels may exchange signals by the International Code (see Appendix II).

The sea-coast to the southward of Cape Henry has a general **S.** by **E.** ¼ **E.** direction for a distance of about 70 miles to Bodies Island Light-house. For a distance of 11 miles south of Cape Henry there are heavy woods close along the beach, but for the remainder of the distance (59 miles) to Bodies Island Light-house the coast-line is formed by a low, flat, and narrow strip of land, with an average width of ⅜ mile, separating the extensive interior waters of North Carolina from the Atlantic Ocean.

Chesapeake Bay, from its entrance to the mouth of the Susquehanna River, at its head, is about 170 miles long in a general **N.** and **S.** direction; the lower half has a width varying from 10 to 20 miles, the upper varies in width from 2½ to 10 miles. The prevailing depth in the lower part of the bay is from 4 to 10 fathoms, with a deeper hole in toward the eastern shore above Cape Charles City. From a point a little above the mouth of the Rappahannock River a long, narrow, and deep hole, following the general course of the bay, extends to within a few miles of the mouth of the Patapsco River. In this hole the depth varies from 10 to 26 fathoms. Toward the head of the bay the water shoals gradually to 12 feet, this depth being found abreast of Red Point at the mouth of Northeast River.

The Chesapeake, from its entrance to the mouth of the Patapsco River, a distance of 140 miles, is navigable for vessels of the largest class. A large foreign and coastwise trade enters the bay bound to the principal ports on its tributaries. A very large trade is carried on by steamboats and small sailing-vessels between the numerous landings on the bay and tributaries and the ports of Baltimore, Norfolk, and Washington. A considerable trade is carried through the Chesapeake and Delaware Canal, principally in steamers and barges built for the purpose.

Tributaries.—The Chesapeake is remarkable for the great number of its tributaries. Those of the eastern shore are of little importance to general navigation, but are much used by small craft engaged in fishing and local trade. The rivers on the western shore give access to the large commercial cities and towns to which Chesapeake Bay is the approach. All the rivers and creeks emptying into the bay are subject to tidal influence; with few exceptions, the tidal action extends to the head of navigation for sea-going or bay vessels.

The Eastern Shore, for about 40 miles above Cape Charles until the entrance of Pokomoke Sound is reached, presents a fairly regular line, broken at intervals by a number of small creeks. To the northward of Pokomoke Sound the shore is extremely irregular nearly to the head of the bay, and presents a confusing net-work of islands, small bays, rivers, and creeks. These intricate waters are of but little importance except for the large fleets of small craft engaged in oyster fishing during the winter, and in carrying farm produce from the numerous landings to other parts

† Chesapeake Bay falls within the limits of the following Coast and Geodetic Survey charts: **A**, Sailing Chart, Atlantic Coast, scale $\frac{1}{1,200,000}$, price $1.00; **376**, Delaware and Chesapeake Bays, scale $\frac{1}{400,000}$, price $0.50; and is also shown on charts **131, 132, 133, 134, 135, 136**, Chesapeake Bay, in six sheets, scale of each $\frac{1}{80,000}$, or 1 mile = 0.912 inch, price of each $0.50.

of the bay. About 5 miles NW. from the entrance to Pokomoke Sound is Tangier Island, the southernmost of a chain of islands which extend nearly 26 miles in a northerly direction. Tangier Sound lies between these islands and the mainland of the eastern shore, and has a number of tributaries. Proceeding northward, other large bays and rivers of the eastern shore are: Hudson River; Choptank River, leading to Cambridge; Eastern Bay; Chester River, leading to Chestertown; Sassafras River, and Elk River. All of these have numerous smaller tributaries; Back Creek, a tributary of the Elk River, is the approach to the western entrance of the Chesapeake and Delaware Canal.

The Western Shore.—Beginning at Cape Henry and proceeding to the westward along the southern shore and then to the northward along the western shore, the principal bays and rivers are: Lynn Haven Roads, a broad open bight just within Cape Henry, and an important anchorage much frequented in southerly winds. Hampton Roads, about 15 miles to the westward of Cape Henry, is at the confluence of the Elizabeth, Nansemond, and James rivers, forming their approach; it is an important anchorage for the largest class of vessels. Elizabeth River has the important cotton-shipping port of Norfolk on its eastern bank, while directly opposite, on the west bank, are Portsmouth and Gosport, the U. S. Navy Yard extending above the latter. The head waters of the Elizabeth River are connected with the inland waters of North Carolina by two canals, the Albemarle and Chesapeake Canal and the Dismal Swamp Canal. The Nansemond River leads to the town of Suffolk; its trade is small. The James River leads to the city of Richmond, and to City Point, Manchester, and Petersburg; Newport News is on the northern point of entrance to the river. A large coastwise and some foreign trade is carried on by these ports. The York River has Yorktown on its western bank, and farther up is West Point, which is of considerable commercial importance. Mobjack Bay forms the approach to several small rivers. The Rappahannock River leads to Port Royal and Fredericksburg. The Potomac River separates Virginia from Maryland; on its banks are Alexandria, Va., Washington, D. C., the capital of the United States, and Georgetown, D. C. The mouth of the Patuxent River is frequently entered for shelter. The Severn River has Annapolis, the capital of Maryland, and the site of the U. S. Naval Academy near its mouth. On the Patapsco River, 9 miles above its mouth, is the city of Baltimore, the most important commercial city approached through Chesapeake Bay. The Susquehanna River empties into the head of the bay; at its mouth is Havre de Grace, and a little above, on the east bank, is Port Deposit.

Oyster Grounds.—Chesapeake Bay and its tributaries are noted for the number and extent of the oyster-beds which cover nearly all the shoals having depths of 6 to 18 feet of water over them. Large fleets of oystermen are engaged in dredging for oysters, in the sounds and bays along the eastern shore, during the season. In many of the tributaries on both sides of the bay the oyster-beds are private property, and are marked by stakes to define the limits of the beds. In the larger rivers these stakes, in some cases, extend out nearly to the edge of the channel.

Prominent Features and Aids.—The entrance of the bay is well marked by two light-houses and a light-vessel. The shores are generally low and present no prominently marked features, below the mouth of the Patuxent River, that can readily be distinguished when in mid-channel. Above the mouth of the Patuxent the western shore is hilly and generally wooded, but the eastern shore is low. The low points of land on both shores have long shoals extending out some distance into the bay which are marked by buoys at their outer ends. The islands along the eastern shore are generally surrounded by extensive shoals. The light-houses and other aids to navigation are the principal guides. The buoyage accords with the system adopted in United States waters (see page V). For description of light-houses see table, pages 16–21.

Channels.—The main channel of Chesapeake Bay favors Cape Henry, and leads in a NNW. ½ W. direction between the Middle Ground on the east and Tail of the Horseshoe Shoal on the west; it is about 2⅝ miles wide outside of the 5-fathom curves. Between Back River Light-house and the mouth of the Patapsco River the channel has a general northerly direction and is free from turns or sharp changes in the courses followed. From the Middle Ground to a short distance above Rappahannock Spit Light-house the channel leads up the middle of the bay; above Rappahannock Spit it favors the western shore until up to the entrance of Eastern Bay, and thence takes the middle of the bay to the southern entrance of the Patapsco River. From Bodkin Point to the head of the bay the channel leads along the eastern shore. A least depth of 5 fathoms can be carried from the entrance of the bay to the mouth of the Patapsco. Above the Middle Ground there are no dangerous shoals except those making out from the shores and surrounding the islands. The most prominent dangers are well marked by buoys and in many cases by light-houses.

The several channels leading into Chesapeake Bay, between Cape Charles and the Middle Ground, are named, respectively, the **North Channel**, **Northwest Channel**, and **Beach Channel**; the North Channel is the only one marked by buoys. These channels have a good depth of water, but the shoals, between which they lead, are mostly unmarked and of a shifting character, making it dangerous for a stranger to attempt to use them.

Pilots.—Both Virginia pilots and Maryland pilots cruise off the entrance of Chesapeake Bay. The boats of the Virginia pilots are distinguishable by their name and the port to which they belong, which is painted on both sides of the foresail in letters at least 9 inches long. The boats of the Maryland pilots, one of them a steamer, are distinguishable by having their names and the place to which they belong painted on the stern, foresail, and mainsail; three of these boats are always stationed to cruise off the entrance of the bay. Vessels bound to ports in the state of Maryland take a Maryland pilot; those bound to ports in Virginia take a Virginia pilot; vessels bound up the Potomac usually take a Maryland pilot, if any, who, on reaching the river, turns the vessel over to a river pilot, or

takes the vessel up himself, under an arrangement in force among the pilots; in either case, the cost to the vessel is the same. Pilots for the smaller tributaries of the bay are either oystermen or fishermen living in the vicinity, and will be found in the bay near the tributary or by sending on shore when off its entrance. For Pilot Laws and Regulations, see Appendix I. For local pilot rules, see "General Information," under the different headings.

Tow-boats will sometimes be found cruising in the lower part of the bay near the entrance, and they will be found in the bay between the entrance and the mouth of the Patapsco River. There is a tow-boat agency at Fortress Monroe, through which tugs may be ordered by telegraph to Hampton Roads from Norfolk, Richmond, and Baltimore. For local towage, see "Tow-boats," under the different headings.

Anchorages.—The following anchorages are the principal ones available for vessels bound up and down the bay: *Lynn Haven Roads*, just to the westward of Cape Henry, affords shelter against southerly winds and has good holding-ground in 3¾ to 5 fathoms water. Or anchorage may be found *near the Tail of the Horseshoe*, in 5 fathoms water, bottom fine sand, about 5 miles northwest from Cape Henry; this anchorage is only used in smooth weather. *Hampton Roads* is one of the most important roadsteads in the United States; it is well sheltered from all winds and is approached through a channel with a least depth of 5 fathoms. *Mobjack Bay* affords anchorage under New Point Comfort in 3 to 4 fathoms water, secure from northerly and northeasterly winds but exposed to winds between east and south. *Rappahannock River*, within its mouth, has anchorage in 3 to 8 fathoms water. In the mouth of the *Potomac River* shelter against northeasterly winds will be found just inside Point Lookout, in 3 to 4½ fathoms water. In southeasterly and westerly winds the best anchorage is in the mouth of *St. Mary's River*, about 8 miles NW. from Point Lookout; this anchorage is well sheltered, has a depth of 3¼ to 4½ fathoms, with good holding-ground. *Patuxent River*, inside Drum Point, affords excellent anchorage for vessels of the largest class, with a depth of 4 to 9 fathoms water, good holding-ground, and well sheltered. To the eastward of Drum Point is good anchorage, but it is exposed to easterly winds. *Annapolis Roads* has good anchorage for large vessels in 4 to 8 fathoms water; it is exposed to easterly winds.

National Quarantine Station.—Quarantine for all ports on Chesapeake Bay and its tributaries, except Baltimore, is conducted in accordance with the regulations of the U. S. Marine-Hospital Service (see Appendix III), and supplementary orders received from the Department from time to time.

The boarding-station is indicated by a quarantine flag displayed on Thimble Shoal Light-house, above which no vessel, subject to visitation by the Health Officer, is allowed to pass without being boarded. Vessels undergoing quarantine are anchored off the Quarantine Hospital at Fisherman's Island until released.

All foreign vessels, and vessels from domestic ports where a contagious disease shall become epidemic, are subject to inspection by the quarantine officers at all seasons of the year.

A fine of $300 is imposed on any vessel violating the U. S. Quarantine Regulations. For local Quarantine Regulations, see the different headings.

U. S. Marine-Hospital Service.—The Marine Hospital at Baltimore is the one to which seamen requiring long-continued hospital treatment are sent from stations in Chesapeake Bay and its tributaries. Marine-hospital surgeons are stationed at Alexandria, Va., Crisfield, Md., Fredericksburg, Va., Georgetown, D. C., Norfolk, Va., and Richmond, Va., at which places arrangements are made for the treatment of seamen. At Tappahannock, Urbana, and Carter's Creek, Va., arrangements have been made with resident physicians for the treatment of seamen. For Regulations of the U. S. Marine-Hospital Service, see Appendix III.

Repairs to hulls of large vessels can be made at Baltimore, Newport News, and Norfolk, where there are large dry-docks. At Baltimore there are several marine-railways and floating-docks capable of taking out large vessels. There are excellent facilities for repairs to machinery of steamers at Baltimore and Norfolk. See also "Repairs" under the different headings.

Supplies.—Coal, fresh water, provisions, and ship-chandler's stores can be obtained at the principal ports. As mentioned under the different headings, supplies can be obtained at other places, but the quantity is apt to be limited and the facilities are not always good. Norfolk, Newport News, and Baltimore are available as coaling-ports for large vessels.

Ice.—In severe winters ice forms in the head of the bay and many of its tributaries. Under the influence of wind and tide ice will sometimes be met with as far down the bay as Cove Point; very seldom below this. The weather shore is generally free from ice. Steam vessels can always pass up and down the bay.

The ice from Tangier and Pokomoke sounds does not interfere with the larger class of vessels in the bay, but small vessels engaged in the oyster fisheries are frequently held by the ice, especially in Kedge's and Holland's straits, and are forced to employ tow-boats to assist them.

LIGHT-HOUSE DISTRICT, ETC.

The coast and waters covered by this volume lie within the **Fifth Light-house District** of the United States. The Light-list for the sea-coasts of the United States and the Buoy-list of the Fifth 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, No. 4, South Street, Baltimore, Md.

TABLE OF LIGHTS.

Number.	Name.	Latitude, north. Longitude, west.	Characteristic of light.	Order of light.	Height of light above sea-level, in feet.	Distance visible in nautical miles.
		° ′ ″				
1	Hog Island	37 23 17 75 41 56	Fixed white	4	60	13½
2	*Cape Charles Light-Vessel*	37 06 (25) 75 42 (35)	Two fixed white	Refl'r	45 45	12 12
3	CAPE CHARLES	37 07 12 75 53 31	Flashing white every 45 sec. Duration of flash 3 sec.	1	160	18¾
4	CAPE HENRY	36 55 35 76 00 27	Fixed white, with a fixed red sector between SW. by W. and S SE. (from seaward).	1	160	18¾
5	CURRITUCK BEACH	36 22 36 75 49 51	Fixed white, varied by a red flash every 90 sec.	1	158	18¾
6	THIMBLE SHOAL	37 00 (52) 76 14 (24)	Fixed white for 1 minute, followed during next minute by six consecutive flashes at intervals of 10 seconds, alternately red and white.	4	45	12
7	Old Point Comfort	37 00 06 76 18 24	Fixed white	4	56	12
8	ELIZABETH RIVER. Craney Island	36 53 33 76 20 18	Fixed white	5	36½	11½
9	ELIZABETH RIVER. Lambert's Point	36 52 33 76 19 55	Fixed red	5	38	8½
10	ELIZABETH RIVER. Naval Hospital	36 50 55 76 18 06	Fixed red	Lens lantern	45	———
11	Newport News Middle Ground					
12	Nansemond River	36 54 53 76 26 40	Fixed red	6	38½	7½
13	JAMES RIVER. White Shoal	37 01 19 76 31 40	Fixed white	6	35	11
14	JAMES RIVER. Point of Shoals	37 04 06 76 39 12	Fixed white	6	35	11
15	JAMES RIVER. Deep-Water Shoals	37 08 56 76 38 12	Fixed white	6	35	11
16	JAMES RIVER. Jordan's Point	37 18 46 77 13 25	Fixed white	6	31½	10½
17	JAMES RIVER. Dutch Gap Cut-off (lower light)	37 22 (35) 77 21 (34)	Fixed red	Lens lantern	24	———
18	JAMES RIVER. Dutch Gap Cut-off (upper light)	37 22 (38) 77 21 (38)	Fixed red	Lens lantern	24	———
19	CHESAPEAKE BAY. Back River	37 05 14 76 16 12	Fixed white, varied by a white flash every 90 sec.	4	35	11½
20	CHESAPEAKE BAY. YORK SPIT	37 12 34 76 15 16	Fixed red	4	38	11½
21	CHESAPEAKE BAY. Old Plantation Flats	37 13 44 76 02 50	Fixed white, with a fixed red sector between N. by W. ¼ W. and NW. ¾ W. (from seaward).	4	40½	11½
22	CHESAPEAKE BAY. Cherrystone	37 15 38 76 02 05	Fixed white, with a fixed red sector between N. ¾ E. and S SW. ¼ W. (from seaward).	4	36	11½
23	YORK RIVER. Too's Marshes	37 14 (15) 76 23 (11)	Fixed white	5	43	11½
24	YORK RIVER. Bell's Rock	37 29 (26) 76 45 (35)	Fixed white	4	45½	12
25	CHESAPEAKE BAY. NEW POINT COMFORT	37 18 03 76 16 41	Fixed white	4	60	13½
26	CHESAPEAKE BAY. WOLF TRAP	37 23 16 76 11 33	Fixed white, varied by a white flash from N. ¼ E. through eastward to S. ¾ W. (from seaward); fixed red, varied by a red flash throughout the remaining sector. Interval between flashes, 30 secs.	4	38	11½
27	CHESAPEAKE BAY. Stingray Point	37 33 (40) 76 16 (13)	Fixed red	6	36	7½
28	Bowler's Rock (Corner Rock)	37 49 (18) 76 43 (48)	Fixed white	5	35	11½

CHESAPEAKE BAY AND TRIBUTARIES.

Number.	Color and peculiarity of light-house or vessel.	Height, in feet, from base of structure to center of lantern.	Fog-signal.
1	Tower and dwelling, white; lantern, black	45	
2	Two masts, schooner-rigged; red cage-work day-mark at each mast-head. Hull, red, with "CAPE CHARLES, No. 46," in large white letters on each side.		12-inch steam-whistle; blasts 5 sec., with alternate intervals of 10 and 90 sec. If whistle be disabled, a bell will be rung by hand.
3	Tower, white; lantern, black; out-buildings, white	150	
4	Octagonal tower; base, service-room, and lantern, black; shaft colored on each face, half white and half black, alternating so that upper and lower halves of faces show alternately black and white. Dwellings and fog-signal house stand near.	152	1st-class steam-siren; blasts 5 sec., intervals 90 sec.
5	Tower, red; lantern, black. Dwelling detached and in rear. To the N. and S. of tower are high white sand-hills; no other prominent objects in the vicinity.	150	
6	White hexagonal screw-pile structure; piles and roof, brown; lantern, black		Two bells struck by machinery, simultaneously, every 5 sec.
7	Tower and dwelling, white; lantern, black; fog-bell frame, brown, detached	47	Bell struck by machinery every 10 sec.
8	Octagonal white screw-pile structure; piles and roof, brown; lantern, black		Bell struck by machinery every 12 sec.
9	Square screw-pile structure, painted dark lead-color; piles, brown; lantern, black; shingle roof.		Bell struck by machinery every 10 sec.
10	Lantern suspended on a mast		
11	To be built		
12	White hexagonal screw-pile structure; piles and roof, brown; lantern, black		Bell struck by machinery every 7 sec.
13	White hexagonal screw-pile structure; piles and roof, brown; lantern, black		Bell struck by machinery every 10 sec.
14	White hexagonal screw-pile structure; piles and roof, brown; lantern, black		Bell struck by machinery at alternate intervals of 5 and 20 sec.
15	White hexagonal screw-pile structure; piles and roof, brown; lantern, black		Bell struck by machinery every 15 sec.
16	Square white tower; lantern, black; dwelling in rear, white; roof, brown	28¼	Bell struck by machinery every 10 sec.
17	Lantern, in red box, on white post	19	
18	Lantern, in red box, on white post. White dwelling, on top of hill, for both lights	19	
19	White tower and dwelling; lantern, black	30	
20	White hexagonal screw-pile structure; piles, brown; lantern, black		Bell struck by machinery every 10 sec.
21	Square frame dwelling, painted white; iron screw-pile foundation and roof, brown; blinds, green; lantern, black.		Bell struck by machinery every 15 sec.
22	White hexagonal screw-pile structure; piles and roof, brown; lantern, black		Bell struck by machinery a double blow every 30 sec.
23	Square white screw-pile structure; piles and roof, brown; lantern, black		Bell struck by machinery alternately a double and a single blow, with intervals of 30 sec.
24	White hexagonal screw-pile structure; piles and roof, brown; lantern, black		Bell struck by machinery every 15 sec.
25	Tower, white; lantern, black; dwelling, white	56	
26	White hexagonal screw-pile structure; piles, brown; lantern, black		Bell struck by machinery every 15 sec.
27	White hexagonal screw-pile structure; piles and roof, brown; lantern, black		Bell struck by machinery at alternate intervals of 5 and 30 sec.
28	Square white screw-pile structure; piles, brown; shingle roof; lantern, black		Bell struck by machinery every 10 sec.

TABLE OF LIGHTS—Continued.

Number.		Name.	Latitude, north. Longitude, west.	Characteristic of light.	Order of light.	Height of light above sea-level, in feet.	Distance visible in nautical miles.
29	Chesapeake Bay.	Windmill Point	37 35 (55) 76 14 (13)	Fixed white	5	38	11½
30	Chesapeake Bay.	Watt's Island	37 46 56 75 58 36	Fixed white, varied by a white flash every 2 minutes.	5	50	12½
31	Chesapeake Bay.	Tangier Sound					
32		Jane's Island	37 57 (45) 75 55 (10)	Fixed white	4	40	11½
33		Somer's Cove	37 58 03 75 52 (33)	Fixed white	6	35	11½
34	Chesapeake Bay.	Great Wicomico River	37 48 (16) 76 15 (54)	Fixed white with two fixed red sectors; the northern sector between SW. by W. and E SE., and the southern sector between N NW. and E NE. (from seaward).	4	43½	12
35	Chesapeake Bay.	Smith's Point	37 53 (41) 76 11 (42)	Flashing white, from N. ⅛ W. through southeastward to W., and from S. ¼ E. to SE. ½ E. (from seaward); flashing red throughout the intervening sectors. Interval between flashes, 30 sec.	4	38	11½
36	Potomac River.	Point Lookout	38 02 19 76 19 20	Fixed white, with a fixed red sector between NW. by W. ½ W. and SW. (from seaward).	4	43	11½
37	Potomac River.	Piney Point	38 08 07 76 31 48	Fixed white	5	35	11½
38	Potomac River.	Blakistone Island	38 12 26 76 44 42	Fixed white, with a fixed red sector between W. and SW. (from seaward).	4	46	12½
39	Potomac River.	Cob Point Bar	38 14 (27) 76 49 (32)	Fixed white	4	40	11½
40	Potomac River.	Lower Cedar Point	38 20 23 76 59 37	Fixed white, with a fixed red sector between N NW. ⅝ W. and W. (from seaward).	5	35	11½
41	Potomac River.	Mathias Point Shoal	38 24 (16) 77 02 (17)	Fixed white	5	45	12
42	Potomac River.	Upper Cedar Point	38 24 10 77 04 58	Fixed white, with a fixed red sector between W. by S. and SW. ¼ W.; and another between NE. ⅝ N. and NE. by E. ⅝ E.) from seaward).	5	35	11
43	Potomac River.	Fort Washington	38 42 (45) 77 02 (11)	Fixed white	6	17	9
44	Potomac River.	Jones's Point	38 47 25 77 02 27	Fixed white	5	35	11½
45	Chesapeake Bay.	Holland's Island Bar	38 04 (10) 76 05 (42)	Fixed white	4	43½	12
46	Chesapeake Bay.	Solomon's Lump	38 02 52 76 00 52	Fixed white	5	42	11½
47	Chesapeake Bay.	Great Shoals	38 12 (42) 75 52 (53)	Fixed white	5	39	11½
48	Chesapeake Bay.	Clay Island	38 13 56 75 58 27	Fixed white, with a fixed red ray	6	42	11½
49	Chesapeake Bay.	Hooper's Straits	38 13 (35) 76 04 (08)	Fixed white, with a fixed red ray	5	42	11½
50	Chesapeake Bay.	Drum Point	38 19 (03) 76 25 (20)	Fixed red	4	47	11½
51	Chesapeake Bay.	Cove Point	38 23 10 76 22 55	Fixed white, varied by a white flash every 90 sec.	4	46	12
52	Chesapeake Bay.	Sharp's Island	38 38 (25) 76 22 (27)	Fixed white, with a fixed red sector from W. ½ S. through northeastward to S. by E. ⅝ E. (from seaward).	4	55	12½
53	Chesapeake Bay.	Choptank River	38 39 (22) 76 10 (56)	Fixed white	6	35	11½
54	Chesapeake Bay.	Bloody Point Bar	38 50 (05) 76 23 (50)	Fixed white, with a fixed red sector from N NE. ½ E. through southeastward to N W. by W. ¾ W. (from seaward).	4	57	11½
55	Chesapeake Bay.	Thomas's Point Shoal	38 54 (09) 76 25 (55)	Flashing white from N. by E. ¼ E. through eastward to S SW. ¼ W. (from seaward); flashing red throughout the remaining sector. Interval between flashes 30 sec.	4	43½	12
56	Chesapeake Bay.	Greenbury Point	38 58 (24) 76 27 (20)	Fixed white	6	50	11½

CHESAPEAKE BAY AND TRIBUTARIES—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 hexagonal screw-pile structure; piles and roof, brown; lantern, black		Bell struck by machinery every 10 sec.
30	White tower, with white dwelling detached; lantern, black	40	
31	To be built		
32	White hexagonal screw-pile structure; piles and roof, brown; lantern, black		Bell struck by machinery every 15 sec.
33	Square white screw-pile structure; piles, brown; shingle roof; roof of lantern, black.		Bell struck by machinery every 15 sec.
34	White hexagonal screw-pile structure; piles and roof, brown; lantern, black		Bell struck by machinery, a double blow every 15 sec.
35	White hexagonal screw-pile structure; piles and lantern, black; roof, brown		Bell struck by machinery every 15 sec.
36	Black lantern on white dwelling; fog-bell tower painted white, at E. end of coal-shed.	36	Bell struck by machinery every 10 sec.
37	Tower and dwelling, white; lantern, black; fog-bell tower, white, 15 feet to westward.	30	Bell struck by machinery every 20 sec.
38	Black lantern on white dwelling; detached fog-bell tower, brown	41	Bell struck by machinery every 16 sec.
39	Square white screw-pile structure; piles and roof, brown; lantern, black		Bell struck by machinery, a double blow every 15 sec.
40	Square white screw-pile structure; piles, brown; shingle roof; roof of lantern, black.	35	Bell struck by machinery every 12 sec.
41	White hexagonal screw-pile structure; piles and roof, brown; lantern, black	45	Bell struck by machinery, a double and single blow, alternately, at intervals of 30 sec.
42	Square white screw-pile structure; piles and roof, brown; lantern, black; window-shutters, green.	35	Bell struck by machinery every 15 sec.
43	White tower, with black lantern. Dwelling in rear of tower	17	Bell struck by machinery every 15 sec.
44	Black lantern on white dwelling		
45	White hexagonal screw-pile structure; piles and roof, brown; lantern, black		Bell struck by machinery every 10 sec.
46	Square white screw-pile structure; roof, brown; lantern, black		Bell struck by machinery, alternately a double and a single blow at intervals of 30 sec.
47	Square white screw-pile structure; piles and roof, brown; lantern, black		Bell struck by machinery every 15 sec.
48	Black lantern on white dwelling	36	
49	White hexagonal screw-pile structure; piles, brown; lantern, black		Bell struck by machinery every 12 sec.
50	White hexagonal screw-pile structure; piles and roof, brown; lantern, black		Bell struck by machinery, a double blow every 15 sec.
51	Tower and dwelling, white; lantern, black	39	Bell struck by machinery every 12 sec.
52	Tower on a cylindrical iron caisson. Tower and caisson painted brown; lantern, black.	55	Bell struck by machinery, a double blow every 10 sec.
53	White hexagonal screw-pile structure; piles and roof, brown; lantern, black		Bell struck by machinery every 10 sec.
54	Brown tower, on brown cylindrical iron caisson; lantern, black	57	Bell struck by machinery every 12 sec.
55	White hexagonal screw-pile structure; piles and roof, brown; lantern, black		Bell struck by machinery, a treble blow at intervals of 30 sec.
56	Black lantern on white dwelling	35	

TABLE OF LIGHTS—Continued.

Number.		Name.	Latitude, north. Longitude, west.	Characteristic of light.	Order of light.	Height of light above sea-level, in feet.	Distance visible in nautical miles.
			° ′ ″				
57	CHESAPEAKE BAY—Cont'd.	Sandy Point	39 00 (52) 76 23 (08)	Fixed white, varied by a white flash from N. by E. ½ E. through eastward to S. ⅜ E. (from seaward); fixed red, varied by a red flash throughout the remaining sector. Intervals between flashes 90 sec.	5	52	12¼
58		Love Point	39 03 (15) 76 17 (08)	Fixed white	5	38	11¼
59		Craighill Channel (front)	39 11 (15) 76 23 (37)	Two fixed white	5 Range lens.	40 22¾	11¼ 10
60		Craighill Channel (rear)	39 13 (41) 76 23 (37)	Fixed white	Range lens.	106	16¼
61	PATAPSCO RIVER.	SEVEN-FOOT KNOLL	39 09 20 76 24 33	Fixed red	4	43	11¼
62		New Cut-off Channel (front)	39 11 (43) 76 26 (58)	Fixed white	Refl'r	26	———
63		New Cut-off Channel (rear)	39 12 (50) 76 27 (52)	Fixed white	Refl'r	65	———
64		Fort Carroll	39 12 (53) 76 31 (09)	Fixed white	5	75	12¾
65		Hawkins's Point	39 12 28 76 31 58	Fixed white	Refl'r	28	10¼
66		Leading Point	39 12 49 76 33 08	Fixed white	Refl'r	70	14
67		Lazaretto Point	39 15 46 76 34 18	Flashing red every 5 sec	4	39	11¼
68	UPPER PART OF CHESAPEAKE BAY.	Poole's Island	39 17 26 76 16 00	Fixed white	4	35	11¼
69		Turkey Point	39 27 00 76 00 31	Fixed white	4	65	13¼
70		Fishing Battery	39 29 (38) 76 05 (00)	Fixed white	6	36	11¼
71		Havre de Grace	39 32 27 76 05 06	Fixed red	6	40	7¼
72		Old Town Point Wharf	39 30 (10) 75 54 (54)	Fixed white	Lens lantern	25	———
73		Randall's Wharf	39 30 (04) 75 51 (40)	Fixed white	Lens lantern	20	———

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

1st. PRIMARY SEA-COAST LIGHTS.

2d. SECONDARY SEA-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″).

CHESAPEAKE BAY AND TRIBUTARIES—Continued.

Number.	Color and peculiarity of light-house or vessel.	Height, in feet, from base of structure to center of lantern.	Fog-signal.
57	Red brick dwelling on brown cylindrical iron caisson; lantern, black	52	Bell struck by machinery every 10 sec.
58	White hexagonal screw-pile structure, protected by riprap; piles and roof, brown; lantern, black.		Bell struck by machinery every 8 sec.
59	Brown dwelling on brown cylinder, surmounted by black lantern	40	Bell struck by machinery at alternate intervals of 3 and 30 sec.
60	Open-frame pyramid on four sides; lower portion, white; upper part, brown; trimmings, lead-color; lantern, black.	100	
61	Brown octagonal screw-pile structure, with green window-shutters	43	Bell struck by machinery every 12 sec.
62	Octagonal red-brick tower	18	
63	Four-sided open iron-frame pyramid, with square central shaft, surmounted by a lantern. Frame-work and shaft painted white; lantern-roof, brown.	56	
64	Black lantern on white structure	75	Bell struck by machinery every 10 sec.
65	White hexagonal screw-pile structure; iron-work and roof, brown	28	
66	White tower and brown dwelling, attached; mast surmounted by black ball stands immediately behind, and shows about 15 feet above the tower.	40	
67	Tower, white; lantern, black; dwelling, white; fog-bell frame, brown	34	Bell struck by machinery every 10 sec.
68	Tower and dwelling, white; lantern, black; detached fog-bell frame, brown	30	Bell struck by machinery every 12 sec.
69	Tower, dwelling, and fog-bell tower, white; lantern, black. The light-tower is partly hidden by foliage.	30	Bell struck by machinery every 10 sec.
70	Black lantern on white dwelling	32	
71	Tower and dwelling, white; lantern, black	30	
72	Lantern on white stake		
73	Lantern on red stake		

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.

In the column of "Characteristic of light," the time between flashes is given from beginning of one flash to the beginning of the next succeeding one.

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

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

WIND-SIGNAL STATIONS AND SEA-COAST TELEGRAPH STATIONS—CHESAPEAKE BAY.

The wind-signals of the U. S. Signal Service are shown for the benefit of mariners at the following points. The signals are described and their meaning explained in Appendix II.

Cape Henry, Va. **Norfolk, Va.**
Fortress Monroe, Va. **Baltimore, Md.**

There is a sea-coast telegraph station at Cape Henry with which passing vessels may communicate by the use of the International Code of Signals. Messages are sent from the station at Cape Henry to the U. S. Signal-Service Station at Norfolk, Va., and from thence forwarded at the expense of the person to whom the message is addressed.

UNITED STATES LIFE-SAVING STATIONS.

The following list of life-saving stations has been corrected to September 20, 1889. The geographical positions given are approximate, and are taken from the Official Register of the service. 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.		
			°	′	″	°	′	″
Hog Island	Va	South end of Hog Island	37	22	20	75	42	30
Cobb's Island	Va	South end of Cobb's Island	37	17	30	75	47	00
Smith's Island	Va	At Cape Charles Light	37	07	00	75	53	40
Cape Henry	Va	¾ mile SE. of Cape Henry Light	36	55	10	75	59	50
Seatack	Va	5½ miles S. of Cape Henry Light	36	51	10	75	58	40
Dam Neck Mills	Va	10 miles S. of Cape Henry Light	36	47	10	75	57	30
Little Island	Va	On beach abreast of North Bay	36	41	30	75	55	20
False Cape	Va	On beach abreast of Back Bay	36	36	00	75	52	50

TIDES—CHESAPEAKE BAY.‡

GENERAL TABLE.

Time of high water at Old Point Comfort is $8^h\ 46^m$ after the moon's meridian passage (moon's southing).

Locality.	Time of H.W. before or after time of H. W. at Old Point Comfort.	Mean Rise and Fall. Mean tides.	Spring tides.	Neap tides.	Mean Duration of— Rise.	Fall.	Stand.	Rise of highest tide observed.
	h. m.	Feet.	Feet.	Feet.	h. m.	h. m.	h. m.	Feet.
Old Point Comfort		2.5	2.9	2.1	6 27	5 58	0.14	7.6
Cape Charles	.57 before.	2.8	3.2	2.4	6 09	6 16	--------	4.2
Cherrystone Light-house	.23 "	2.5	2.9	2.1	5 38	6 47	--------	3.6
York River Entrance	.16 after.	2.4	2.7	2.1	6 27	5 38	--------	--------
Piankatank River Entrance	1.17 "	1.3	1.5	1.1	5 50	6 35	0.33	2.5
Tangier Sound, Crisfield	4.04 "	1.9	2.2	1.6	6 02	6 23	--------	3.9
Potomac River Entrance	4.10 "	1.4	1.7	1.1	6 03	6 22	0.35	2.6
Patuxent River Entrance	4.53 "	1.4	1.7	1.1	5 44	6 41	0.25	3.1
Sharp's Island	6.26 "	1.3	1.6	1.0	5 35	6 50	--------	3.3
Severn River, Annapolis	8.18 "	0.9	1.1	0.7	6 11	6 14	0.32	3.2
Chester River, Harrison's Wharf	10.01 "	1.7	2.0	1.4	--------	--------	--------	--------
Baltimore Harbor	10.13 "	1.3	1.6	1.0	5 53	6 32	--------	4.2
Sassafras River	11.59 "	2.3	2.8	1.8	5 44	6 41	--------	4.3
Havre de Grace	13.16 "	1.5	1.8	1.2	5 45	6 40	--------	3.1

† 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.

‡ **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 given on pages VII–VIII, price $0.25.

TIDAL CURRENTS IN CHESAPEAKE BAY.

Stations.		*Strength* of Flood Current.		*Strength* of Ebb Current.	
No.	Locality.	Set.	Drift, knots.	Set.	Drift, knots.
1	1 mile N. from Cape Henry Light-house	NW. ¼ N.	.8	E SE. ⅝ E.	.8
2	Between Tail of Horse Shoe and Horse Shoe	NW. ⅜ N.	1.2	SE. ⅞ E.	1.2
3	⅞ mile SE. ½ E. from Thimble Shoal Light-house	NW. by W. ¼ W.	.9	E SE. ⅞ E.	1.7
4	5 miles E. of Back River Light-house	N. by W. ¼ W.	1.5	S. by E. ¼ E.	1.1
5	2¼ miles SE. by S. from York Spit Light-house	N. by E. ⅝ E.	.9	S. ⅝ W.	.9
6	1¼ miles E. ½ N. from Wolf Trap Light-house	N NE. ¼ E.	.7	S SW. ½ W.	1.1
7	½ mile SE. from Rappahannock Spit Buoy	NE. ⅜ E.	.8	S. by E. ¾ E.	1.5
8	2½ miles off Point No Point	N. by W.	.5	SE. ⅜ S.	.4
9	Western Entrance Hooper's Straits and Honga River	NE. ⅝ E.	.5	SW. ⅝ W.	.6
10	3¼ miles SE. by E. ¾ E. from Cedar Point	N. ¼ W.	.7	SE. ½ S.	.4
11	1½ miles E. ½ N. from Drum Point Light-house	W SW. ¼ W.	.4	NE. by E. ⅝ E.	.7
12	2¾ miles N. ½ E. from Cove Point Light-house	N NE.	1.3	S SW. ¼ W.	1.3
13	2½ miles S. by W. ½ W. from Sharp's Island	N NE.	1.1	S. ⅞ W.	1.3
14	3⅝ miles E SE. from Holland Point	N. ¾ E.	.4	S. by W. ⅝ W.	.6
15	3⅜ miles SW. ½ W. from Bloody Point Light-house	N NE. ⅜ E.	.4	S SW. ¾ W.	.4
16	1⅜ miles SE. ½ E. from Thomas' Point Light-house	NE. ⅝ N.	.5	S SW. ¾ W.	.9
17	Mid-channel off Annapolis Roads	N. ¾ W.	.9	S SW. ¼ W.	1.0
18	Mid-channel off Sandy Point Light-house	N. by E. ¼ E.	.9	S.	1.0
19	SE. from Seven-Foot Knoll Light-house	N NW. ⅜ W.	.7	S. ¾ W.	.7
20	NE. from Seven-Foot Knoll Light-house	N NE.	.6	S SW. ⅜ W.	.6
21	East of Pool's Island	NE. ¼ N.	.8	SW. ⅛ W.	1.5
22	Off Worton Point	N NE. ¾ E.	1.6	S SW. ¼ W.	1.7
23	2½ miles W. by S. from Howell's Point	NE. ½ N.	1.0	SW. ⅜ W.	1.1
24	1⅝ miles SW. ¾ W. from Turkey Point Light-house	NE. ¼ N.	.7	S SW. ⅝ W.	1.0
25	2 miles NW. ¼ W. from Turkey Point Light-house	N. by W. ⅛ W.	.7	S. ⅛ E.	.7

VARIATION OF THE COMPASS.

The magnetic variation at different points in Chesapeake Bay and its tributaries for 1889 is as follows:

Locality.	Compass Variation.	Annual Increase.
Chesapeake Entrance between Cape Charles and Cape Henry	3° 30′ W.	3′
Norfolk, Va.	3 25	3
Richmond, Va.	3 10	3
Potomac River Entrance	3 55	3
Washington, D. C.	4 10	2½
Severn River Entrance	4 30	3
Baltimore, Md	4 40	3
Near Pool's Island Light-house	4 45	3
Havre de Grace, Md.	4 55	3
Crisfield, Md.	4 00	3
Cambridge, Md.	4 40	3
Chestertown, Md.	4 45	3

BEARINGS AND DISTANCES.

The following bearings and distances serve to indicate the relative positions of light-houses along the shores of the bay and cannot, in all cases, be taken as courses to be steered.

Cape Charles Light-vessel, Lat. 37° 06′ 25″ N.; Long. 75° 42′ 35″ W. (approx).—The following are bearings and distances from Cape Charles Light-vessel:—

	Miles.
Cape Charles Light-house, W. ¾ N.	8¾
Cape Henry Light-house, SW. by W.	18¼
Bell buoy on S. end of Middle Ground, SW. by W. ¾ W.	14

Cape Henry Light-house, Lat. 36° 55′ 35″ N.; Long. 76° 00′ 27″ W.—The following are bearings and distances from Cape Henry Light-house:—

	Miles.
Cape Charles Light-house, N NE. ½ E.	12¾
Thimble Shoal Light-house, NW. by W. ½ W.	12¼
Old Point Comfort Light-house, W NW. ⅛ W.	15¼
Back River Light-house, NW. ⅝ W.	16
York Spit Light-house, N NW. ¾ W.	21
New Point Comfort Light-house, N NW. ⅜ W.	26
Wolf Trap Light-house, N. by W. ¼ W.	29½
Old Plantation Flats Light-house, N. ¼ W.	18¼
Smith's Point Light-house, N. ½ W.	59

Turn of Channel Buoy.—The following are bearings and distances from the Turn of Channel Buoy, 6⅛ miles E NE. ¾ E. from Back River Light-house:—

	Miles.
Cape Henry Light-house, S SE. ½ E. Southerly	13½
Thimble Shoal Light-house, SW. ⅝ S.	7⅝
Old Plantation Flats Light-house, NE. ½ N.	8⅝
York Spit Light-house, NW. ½ N.	7½
New Point Comfort Light-house, N NW. ¼ W.	12½
Wolf Trap Light-house, N. ¼ W.	16½

Wolf Trap Light-house.—The following are bearings and distances from Wolf Trap Light-house:—

	Miles.
Thimble Shoal Light-house, S. ⅞ W.	22¾
Back River Light-house, S. by W. ⅝ W.	18¾
York Spit Light-house, S. by W. ⅞ W.	11¼
Rappahannock Spit Light-house, N. ⅝ W.	12⅝
Smith's Point Light-house, N. ¼ E.	30
Watt's Island Light-house, NE. by N.	27½
Old Plantation Flats Light-house, S SE. ⅞ E.	12

Smith's Point Light-house.—The following are bearings and distances from Smith's Point Light-house:—

	Miles.
Rappahannock Spit Light-house, S. ⅝ W.	18
Point Lookout Light-house, N NW. ¾ W.	10½
Cove Point Light-house, N. by W. ¼ W.	30¼
Entrance to Hooper's Straits, N. by E. ¼ E.	20
Entrance Buoy, Kedges Straits, NE. ½ N.	11⅞
Old Plantation Flats Light-house, S. ⅝ E.	40½

Cove Point Light-house.—The following are bearings and distances from Cove Point Light-house:—

	Miles.
Thomas' Point Shoal Light-house, N. ⅛ W.	31¼
Bloody Point Bar Light-house, N. ⅛ E.	26¾
Sharp's Island Light-house, N. ⅝ E.	15¼

Thomas' Point Shoal Light-house.—The following are bearings and distances from Thomas' Point Light-house:—

	Miles.
Sandy Point Light-house, N NE.	7¼
Pool's Island Light-house, N NE.	24¾
Bloody Point Bar Light-house, S SE. ⅝ E.	4¼
Sharp's Island Light-house, S. ¾ E.	15½

Sandy Point Light-house.—The following are bearings and distances from Sandy Point Light-house:—

	Miles.
Seven-Foot Knoll Light-house, N. ¼ W.	8½
Craighill Channel Front Range Light, N. ¼ E.	10⅝
Pool's Island Light-house, N NE.	17⅝
Love Point Light-house, NE. by E. ¾ E.	5¼
Bloody Point Bar Light-house, S. ⅝ W.	10¾

Turkey Point Light-house.—The following are bearings and distances from Turkey Point Light-house:—

	Miles.
Pool's Island Light-house, SW. by W.	15½
Fishing Battery Light-house, NW. ¼ W.	4½
Havre de Grace Light-house, N NW. ½ W.	6½

GENERAL REMARKS, APPROACHING CHESAPEAKE BAY ENTRANCE.

From the Northward.—On the coast, between Delaware and Chesapeake bays, there are no prominent natural features; the light-houses, light-vessels, and life-saving stations are the only objects easily distinguished from a distance. The 100-fathom curve extends along at an average distance of about 60 miles from the shore-line. Outside the 100-fathom curve the water deepens very rapidly. Soundings in 30 fathoms indicate a distance of 35 to 50 miles from the shore. Inside of the 30-fathom curve the water shoals irregularly; the bottom is composed of sand, broken shells, pebbles, and gravel, or a combination of them. 15 fathoms will be found 12 to 32 miles off shore, and vessels of heavy draught, approaching the coast in thick weather, should not get into a less depth unless sure of their positions. At night, in clear weather, when in 12 fathoms, some one of the lights or light-vessels will generally be visible.

Vessels coming from Delaware Bay may run along close to the shore, inside of the outlying shoals, but it is not advisable to do so, for if caught in an easterly gale the chances for going on the beach are very great; it is safest at all times to pass outside of the outlying shoals. A course of S SW. ¼ W. from Five-Fathom Bank Light-vessel, made good for 56 miles, will lead to a point about 4 miles E. of Winter Quarter Shoal Light-vessel and clear of all dangers. The course from Winter Quarter Shoal Light-vessel to Cape Charles Light-vessel is SW. ¾ S., and the distance about 58 miles.

The tidal influences along the coast to the northward of Cape Charles are weak, and the direction and velocity of the currents are due, in a great degree, to the direction and force of the wind.

From the Eastward.—The entrance may be approached boldly from the eastward, as there are no outlying dangers. 20 fathoms will be found about 45 miles to the eastward of Cape Henry; inside that depth the water shoals irregularly. In clear weather, Cape Henry and Cape Charles light-houses and Cape Charles Light-vessel will be made about the same time. In thick weather, safety may be insured by keeping in 10 fathoms. When in latitude 37° 00′ N., and 30 fathoms of water, a due W. course will lead directly for Cape Henry Light-house.

From the Southward.—Between Cape Henry and Cape Hatteras, a distance of about 105 miles, there are no very dangerous outlying shoals, and none over 5 miles from the beach. Vessels of the heaviest draught may, in smooth weather, run along within 5 miles of the shore-line, but are not advised to do so, as it is a dangerous coast to be caught on in an easterly gale. The narrow stretch of sand beach forming the greater length of the shore-line is very low, and frequently may not be visible, even in clear weather, more than 4 or 5 miles. The 100-fathom curve, which, abreast of Cape Henry, is about 65 miles off shore, gradually approaches the shore-line to the southward, and southeast of Cape Hatteras is only about 20 miles from the shore. The 30-fathom curve is about 5 miles inside of the 100-fathom curve. Abreast of Cape Henry 20 fathoms will be found about 45 miles off shore, but farther to the southward that depth is found closer in, and at Cape Hatteras only 11 miles off shore. With the exception of a few places, 5 to 9 fathoms may be carried to within 1 mile of the shore. Inside of 15 fathoms the depth is extremely irregular, and there are many holes of limited extent lying far inside of the general limits of the corresponding depth.

In running along this coast in thick weather take soundings frequently, and when less than 15 fathoms is found haul off shore at once. Having rounded Hatteras Shoals and brought Cape Hatteras Light-house to bear W., distant 10 to 14 miles, steer N. ¼ E. for 35 miles; Bodies Island Light-house should then bear W., and the course for Chesapeake Bay Entrance is N. by W. ¼ W., and the distance about 70 miles. Cape Henry Light-house will be made broad off the port bow. Having made Cape Henry Light-house, follow the directions for entering Chesapeake Bay from the southward.

Strong currents set up or down this coast with southerly or northerly gales. Their strength and set depend upon the force and duration of the gale, and has been estimated to be as much as 3 or 4 knots per hour during very heavy gales. In southeasterly gales the set of the currents is not parallel to the coast, but more or less in toward it.

SAILING DIRECTIONS, CHESAPEAKE BAY.

1. ***Approaching and Entering.—From the Northward.***—I. *Deep-draught vessels.*—These directions, if followed, will not lead into less than 5½ fathoms water.

Note the "General Remarks Approaching Chesapeake Bay Entrance from the Northward," pages 24–25.

Having made Cape Charles Light-vessel, pass to the eastward of it, and then bring it to bear NE. ¼ E., and steer SW. ¼ W. for about 14½ miles until Cape Henry Light-house bears W. ½ S., distant about 4¼ miles (Cape Charles Light-house, if visible, will then bear about N. by E.). Now steer W NW. ⅜ W. and pass about 1¾ miles to the northward of Cape Henry Light-house, and then—

If bound into Hampton Roads, continue the W NW. ⅜ W. course, and follow the directions under Section 1, heading "Hampton Roads."

If bound up the bay, follow the directions under Section 2, following.

If desiring to anchor in Lynn Haven Roads (the bight immediately to the westward of Cape Henry), stand to the southwestward when Cape Henry Light-house bears S., and anchor according to draught in 3¾ to 5 fathoms water. Do not approach the shore within ¾ mile when abreast of Lynn Haven Inlet, the shallow indentation in the southern shore, 4¼ miles to the westward of Cape Henry Light-house.

II. *Vessels of 16 feet draught or less* may pass Cape Charles Light-vessel close-to on either hand, and bring it to bear **NE.** by **E.** $\frac{3}{4}$ **E.**, and steer **SW.** by **W.** $\frac{3}{4}$ **W.** for about $13\frac{1}{2}$ miles. Cape Henry Light-house should then bear **SW.** by **S.**, distant nearly 5 miles, and Cape Charles Light-house **N NE.** $\frac{1}{4}$ **E.**, distant 8 miles; the brown bell-buoy and Middle Ground buoy (first-class nun, red, No. 2) will be about $\frac{1}{4}$ mile on the starboard hand, then—

If bound into Hampton Roads, steer **W.** $\frac{1}{2}$ **N.** from the bell-buoy, and follow the directions under Section 1, heading "Hampton Roads."

If bound up the bay, steer **W.** $\frac{3}{4}$ **N.** from the bell-buoy until Cape Henry Light-house bears **S SE.** $\frac{1}{2}$ **E.**, and then follow the directions under Section 2, following.

If desiring to anchor in Lynn Haven Roads, continue the **SW.** by **W.** $\frac{3}{4}$ **W.** course from the bell-buoy, and anchor in $3\frac{3}{4}$ to 5 fathoms of water about 4 miles to the westward of Cape Henry Light-house and about 1 mile off shore.

Note.—Vessels of less than 16 feet draught sometimes enter the bay across the shoals lying to the northward of these sailing-lines. A stranger should not attempt to do so, as the shoals are of a shifting nature and the depths over them cannot be relied on, especially after a gale of wind.

Caution.—At night, the red sector of Cape Henry Light-house covers all the shoals lying off Cape Charles, and vessels of 18 feet or less draught will insure safety by keeping on the edge of the red rays. Vessels of heavier draught should follow the preceding directions for heavy-draught vessels, which will lead well to the eastward of the red sector on the **SW.** $\frac{1}{4}$ **W.** course, and through it on the **W NW.** $\frac{3}{8}$ **W.** course.

Remarks.—On the **SW.** $\frac{1}{4}$ **W.** course from the light-vessel, Cape Charles whistling-buoy will be made on the starboard bow and left $\frac{1}{4}$ mile on the starboard hand. Smith's Island and Cape Charles Light-house will be seen to the northwestward. Cape Henry Light-house will be made well on the starboard bow, and when it bears **W.** $\frac{1}{2}$ **S.** (see view), and the course has been changed to **W NW.** $\frac{3}{8}$ **W.**, Lower Middle Ground buoy (nun, red, No. 2) will be made on the starboard bow and should be left nearly $\frac{3}{4}$ mile on the starboard hand. When inside Cape Henry, on a clear day or at night, Thimble Shoal Light-house will be made a little on the starboard bow when on the **W NW.** $\frac{5}{8}$ **W.** course.

On the **SW.** by **W.** $\frac{1}{2}$ **W.** course from Cape Charles Light-vessel, Cape Charles whistling-buoy will be left $1\frac{1}{4}$ miles on the port hand. Cape Henry Light-house will be made off the port bow, and the bell and nun-buoys off the southeastern end of the Middle Ground will be made a little on the starboard bow and left on the starboard hand.

Dangers.—**Smith's Island Shoal** has a least depth of 17 feet over it, and lies about 7 miles **E SE.** $\frac{3}{4}$ **E.** from Cape Charles Light-house and about 2 miles to the westward of Cape Charles Light-vessel.

Shark Shoal has a least depth of 17 feet over it, and lies about $4\frac{1}{4}$ miles **SE.** $\frac{1}{2}$ **E.** from Cape Charles Light-house; about $2\frac{1}{2}$ miles to the southeastward of this shoal is Cape Charles whistling-buoy (red, C. C. in white letters).

Shoal water (less than 18 feet) is found $1\frac{3}{4}$ miles off shore to the northward of Cape Charles Light-house, and 4 miles off shore to the southward of the southern end of Smith's Island. These shoals are not marked and should be avoided by strangers.

The Lower Middle Ground has 20 to 23 feet of water over it, and lies about $3\frac{1}{4}$ miles to the northeastward of Cape Henry Light-house. It is about 3 miles long **E.** and **W.**, and nearly $1\frac{1}{4}$ miles wide **N.** and **S.** The southern edge of this shoal is marked by a buoy (nun, red, No. 2), left on the starboard hand by heavy-draught vessels which pass into the bay between the Lower Middle Ground and Cape Henry. There is a little more than 4 fathoms of water between the Lower Middle Ground and the buoys marking the southeastern end of the Middle Ground.

The Middle Ground is fully described under Section 2, following. Its southeastern end has 16 feet of water over it and bears **N.** by **E.** $\frac{1}{2}$ **E.**, distant $5\frac{3}{4}$ miles from Cape Henry Light-house. **NNE.** $\frac{3}{4}$ **E.**, distant 5 miles from this light-house, are two buoys, one a first-class nun (red, No. 2), and the other a bell buoy (brown), which serve as guides to keep vessels clear of the southeastern end of the Middle Ground and the shoals to the northward. About $1\frac{1}{2}$ miles to the eastward of these buoys are several spots with 19 and 23 feet over them.

Numerous shoal spots of a shifting nature and varying depth lie to the northward of the bell-buoy, between it and Cape Charles. These spots are all avoided by following the sailing directions. A buoyed channel (North Channel) leads through these shoals and along the eastern edge of the Inner Middle Ground, but a stranger should not attempt it.

The shores of Cape Henry, while the light-house bears to the southward of **W.** by **S.**, can be approached to within $\frac{3}{4}$ mile, but if the light-house bears to the northward of **W.** by **S.**, heavy-draught vessels should keep at least $2\frac{1}{4}$ miles off shore, as there are spots with only 27 feet over them 2 miles off shore.

1 A. ***Approaching and Entering.—From the Southward.***—See the "General Remarks Approaching Chesapeake Bay Entrance from the Southward," page 25.

Standing along the shore to the northward of Currituck Light-house, give the beach a berth of 5 miles and steer **N.** by **W.**, keeping the same distance off shore. When Cape Henry Light-house bears **W.** by **N.**, distant about 5 miles, steer **NW.** by **W.** until the light-house bears **SW.** by **W.**, then—

If bound into Hampton Roads, steer **W NW.** $\frac{3}{8}$ **W.**, and follow the directions under Section 1, heading "Hampton Roads."

If bound up the bay, steer **W NW.** $\frac{3}{8}$ **W.** and follow the directions under Section 2, following.

If desiring to anchor in Lynn Haven Roads, stand more to the westward and anchor 1 mile from the shore, about 4 miles to the westward of Cape Henry Light-house, in $3\frac{3}{4}$ to 5 fathoms of water.

Remarks.—Standing to the northward along the coast, when south of Cape Henry, there are no special features; the depths, 5 miles off shore, range from $5\frac{1}{4}$ to 10 fathoms, and the bottom is irregular. About 5 miles below Cape Henry several large buildings may be seen on the beach. After a strong northerly or northeasterly wind, a strong current sets to the southward and in-shore. Vessels approaching Cape Henry from the southward during or after a northerly gale should keep well off shore until it bears to the southward of **W.**, then stand in, giving the light-house a berth of at least 1 mile.

For dangers, see "Dangers," under Section 1, preceding.

2. ***From Cape Henry Light-house to Turn of Channel buoy.***—I. Bring Cape Henry Light-house to bear **S SE.** $\frac{1}{2}$ **E.** over the stern, and steer **N NW.** $\frac{1}{2}$ **W.**, leaving the Junction buoy (first-class nun, red and black horizontal stripes) nearly $\frac{3}{4}$ mile on the port hand. This course made good for $9\frac{1}{2}$ miles from the Junction buoy, or $13\frac{1}{2}$ miles from Cape Henry Light-house, leads up to the Turn of Channel buoy (bell), when the directions in Section 3 should be followed.

The least water found on the sailing-line is 25 feet, and the directions are good for either the day-time or at night.

II. *Vessels of the heaviest draught—over 24 feet*—should bring Cape Henry Light-house to bear **S SE.** over the stern, and steer **N NW.** until Cape Henry light is 8 miles distant, or Thimble Shoal Light-house is in range with Old Point Comfort Light-house or the Hygeia Hotel. Now steer **NW.** $\frac{3}{4}$ **N.**; this course made good for $5\frac{1}{2}$ miles should lead to the Turn of Channel buoy (bell), from which follow the directions in Section 3.

The least water found while following these directions is 5 fathoms, about $4\frac{1}{2}$ miles from Cape Henry Light-house, on the **N NW.** course. These directions are also good for vessels at night—the **N NW.** course leading up on the edge of the red rays in Cape Henry Light, and the **NW.** $\frac{3}{4}$ **N.** course in the white rays of the light directly for York Spit Light-house until up to Turn of Channel buoy (bell).

If beating—not drawing over 20 feet.—When to the northward of the southern end of the Middle Ground, in standing to the eastward, go about as soon as Cape Henry Light-house bears to the southward of **S SE.** The western edge of the Middle Ground rises abruptly from 7 or 8 fathoms of water. Standing to the westward, beware of the Tail of the Horseshoe, which lies about $5\frac{1}{2}$ miles **E.** $\frac{1}{2}$ **S.** from Thimble Shoal Light-house. When approaching this shoal go about when the water shoals to 4 fathoms.

When to the northward of the range of Thimble Shoal and Old Point Comfort light-houses, or Thimble Shoal Light-house and the Hygeia Hotel, you may stand farther to the westward, but go about when the water shoals to 4 fathoms, or when York Spit Light-house bears to the northward of **N.** by **W.** $\frac{3}{4}$ **W.**

Note.—No directions of practical use can be given for the channels to the eastward of the Middle Ground. A stranger should not attempt to stand up the bay except through the Main Channel.

Remarks.—Standing on the **N NW.** $\frac{1}{2}$ **W.** or the **N NW.** courses, Junction buoy and the two Tail of Horseshoe buoys will be left well on the port hand; the two latter will be too distant to be seen. When Thimble Shoal Light-house and the Hygeia Hotel are in range, Tail of Horseshoe north end buoy will be nearly in line with them, and from $1\frac{1}{4}$ to $2\frac{1}{4}$ miles distant on the port hand. The Middle Ground is left on the starboard hand. Middle Ground buoy (nun, red, No. 4), which bears about **W.**, distant $5\frac{1}{2}$ miles from the Quarantine Station on Fisherman's Island, is left $1\frac{1}{4}$ to $1\frac{1}{2}$ miles on the starboard hand; on a clear day Cape Henry Light-house can be seen for a distance of 10 miles, or until abreast of this buoy. A good lookout should be kept for the Turn of Channel buoy, which is left on either hand when passing.

Dangers.—**The Middle Ground** is the southern and westernmost of the shoals which lie to the southwestward of Cape Charles; it has a general depth of 14 to 17 feet over it, and extends for a distance of 9 miles along the eastern side of the main channel of Chesapeake Bay; the width of the Middle Ground between the 18-foot curves is $\frac{1}{4}$ to $\frac{1}{2}$ mile. The southern and western edge of the Middle Ground rises abruptly from the deep water of the bay; on the eastern side are several channels leading between the shoals lying between the Middle Ground and Cape Charles. The southeastern end of the Middle Ground is $5\frac{3}{4}$ miles **N.** by **E.** $\frac{1}{2}$ **E.** from Cape Henry Light-house; about $1\frac{1}{2}$ miles **SE.** by **E.** from this end are two buoys, one a first-class red, nun, No. 2, and the other a brown bell-buoy. $10\frac{1}{4}$ miles **N.** by **W.** $\frac{1}{4}$ **W.** from Cape Henry Light-house and about $5\frac{1}{4}$ miles **W.** from the Quarantine Station on Fisherman's Island, is

the Middle Ground buoy (nun, red, No. 4), which marks the western edge of the shoal. About 3½ miles **N.** by **W.** ¾ **W.** from this buoy and 6¼ miles **SW.** ¾ **S.** from Old Plantation Flats Light-house, is Middle Ground north end buoy (nun, red, No. 6). Heavy-draught vessels should pass at least 1¼ miles to the westward of this buoy.

The **numerous shoal spots**, with 14 to 17 feet of water over them, which lie to the northward and northeastward of the eastern end of the Middle Ground, are of a shifting nature and cannot be described so as to be avoided. A stranger should follow the sailing directions, which lead well to the southward of the shoals.

Tail of the Horseshoe Shoal lies on the western side of the channel, about 5½ miles **E.** from Thimble Shoal Light-house. This is an irregular-shaped shoal, nearly 1½ miles long in a general **N.** by **W.** and **S.** by **E.** direction, about ⅝ mile wide at the widest part, and has 17 to 18 feet of water over it. Tail of Horseshoe Shoal buoy (can, black, No. 1) is off the southeastern end of the shoal, and lies 2 miles to the northwestward of the Junction buoy (nun, red and black horizontal stripes). Tail of Horseshoe Shoal north end buoy (spar, black, No. 1½) is about 5½ miles **E NE.** ⅞ **E.** from Thimble Shoal Light-house and 3 miles **N NW.** from black can-buoy, No. 1. These buoys mark the western edge of the main channel abreast the shoal (see "Remarks," preceding), and should be given a wide berth by heavy-draught vessels.

Inner Middle Ground is a large irregular-shaped shoal, with 6 to 15 feet of water over it, lying between Cape Charles and the northern end of the Middle Ground. The shoal extends 4¼ miles in a general **NW.** by **N.** and **SE.** by **S.** direction, and its greatest width is about 1½ miles. The southern end of this shoal bears **W.**, distant 1 mile from the western end of The Isaacs, and is marked by a buoy (spar, red and black horizontal stripes). About 1¾ miles to the westward of Cape Charles proper the eastern edge of the Inner Middle Ground is marked by a buoy (spar, black, No. 1), and 2¾ miles **N NW.** ¾ **W.** from this buoy is the Upper Middle Ground buoy (spar, red and black horizontal stripes), which marks the northern end of the Inner Middle Ground. These three buoys mark the western side of the North Channel and the eastern edge of the Inner Middle Ground.

Nine-foot Shoal is a narrow shoal, with a least depth of 9 feet over it, lying a little over 1 mile to the westward of the southern end of Inner Middle Ground. The shoal stretches 2⅜ miles in a **NW.** and **SE.** direction, and is ⅜ mile wide at its widest part. The southeastern end is 2½ miles **W SW.** from the southern point of The Isaacs. The Northwest Channel leads between this shoal and the Inner Middle Ground, but there are no aids to mark the shoals.

Latimer Shoal is to the eastward of the northern end of the Inner Middle Ground. It has 13 to 15 feet of water over it, is about 1½ miles long and ⅝ mile wide; it is not marked. To the eastward of this shoal the Beach Channel (28 feet deep) leads along the shore between Cape Charles and Butler's Bluff, connecting with the deep water to the southward of Old Plantation Flats Light-house. To the westward of the shoal is the North Channel.

3. ***From Turn of Channel Buoy, off Back River entrance to Smith's Point Light-house.***—Having followed the directions under Section 2, preceding, and brought Back River Light-house to bear **W SW.** ¾ **W.**, distant about 6⅛ miles, you should be close to the Turn of Channel buoy (bell). From this position the course is **N.** ¼ **E.**, and if made good for a little more than 46½ miles leads about 1½ miles to the eastward of Smith's Point Light-house. When Smith's Point Light-house is made, shape the course so as to pass 1½ to 2 miles to the eastward of it.

The least depth on the sailing-line should be 4¼ fathoms, except at a point 8 miles **S.** by **E.** from Smith's Point Light-house and 6 miles **SE.** by **E.** from Great Wicomico River Light-house, where 3¾ fathoms will be found. Vessels of over 22 feet draught may avoid this spot by hauling to the westward ¾ point when Windmill Point Light-house bears **SW.** by **W.** ½ **W.**, and when Great Wicomico River Light-house bears **W.** steer **N.** by **E.** ½ **E.**, and leave Smith's Point Light-house 1½ miles on the port hand when passing it.

If beating—not drawing over 20 feet.—York Spit Light-house may be approached to within 1 mile, when it bears between **N.** by **W.** and **SW.** (through **W**). Do not bring Wolf Trap Light-house to bear to the eastward of **N.** ½ **E.** when to the southward of it, and when to the northward of it keep to the eastward of a line joining it and Windmill Point Light-house. Wolf Trap Light-house may be approached from the eastward to within ½ mile.

From a point 3 miles below to a point 19 miles above Old Plantation Flats Light-house the eastern shore has shoals making out from 1 to 2¼ miles, and in standing over toward this shore you should go about before getting within 2¼ miles of it. Abreast the mouth of Occohannock Creek and to the northward shoals make out from the shore to a distance of from 2¼ to 3¼ miles, but deep water leads into Pocomoke Sound and Tangier Sound.

Rappahannock Spit extends 2¼ miles in a southeasterly direction from Windmill Point Light-house and connects with the shore to the westward, but there is deep water to the southward and to the northward of it. When to the northward of this light-house do not bring it to bear to the southward of **S.** ½ **W.**, and when Smith's Point Light-house is made do not bring it to bear to the eastward of **N.** by **E.** ¼ **E.**, and keep well to the eastward of the light-house while passing it.

Tangier Island may be approached to within 3½ miles when it bears between **N.** and **NE.** Shoals make out nearly 5 miles from its western shore.

Remarks.—The N. ¼ E. course favors the western shore, from which shoals flats and spits make out. The outer parts of these are marked by light-houses (pile structures) and by buoys. Flats also make out from the eastern shore, and on that side of the bay the shoaling is generally abrupt, while on the western side it is more gradual and the lead affords a better warning.

On the port hand York River entrance and Mobjack Bay are passed; these are separated by York Spit, at the outer part of which is York Spit Light-house (see table of lights, page 16). A black can-buoy marks the end of the spit.

On the starboard hand, well over toward the eastern shore and difficult to distinguish, are Old Plantation Flats Light-house and Cherrystone Light-house, the latter off Cape Charles City. To the westward of Cherrystone Light-house is a buoy.

On the port hand the following are passed to the northward of York Spit Light-house: Mobjack Bay entrance, New Point (Middle Ground) buoy, New Point Comfort Shoal buoy, and New Point Comfort Light-house, a high tower on the mainland (see table of lights, page 16). About 6¼ miles farther up Chesapeake Bay is Wolf Trap Light-house, pile structure about 2½ miles off shore. About 4 miles to the northwestward of Wolf Trap Light-house are two buoys, one marking a wreck and the other on the edge of the shoals making off from the western shore. About 10 miles to the northward of Wolf Trap Light-house the western shore is broken by Piankatank River entrance, and just to the northward of this is Rappahannock River entrance leading in between two light-houses which stand off shore. Stingray Point Light-house, a little over 1 mile off shore, marks the southern side of the entrance into Rappahannock River; the northern side is marked by Windmill Point Light-house (see table of lights, page 18) on Rappahannock Spit. The spit extends well outside the light-house; off its extremity is a buoy.

The eastern shore, for a stretch of nearly 30 miles to the northward of Cherrystone Light-house, shows in the distance, while on the N. ¼ E. course of the sailing-line, as being low and wooded, without remarkable features; this shore is broken by many small creeks. Flats and sand-bars extend out 1 to 3 miles from the shore, and the shoaling is abrupt in places.

The western shore, from Windmill Point Light-house to Smith's Point Light-house, a distance of a little more than 18 miles, is broken by many small creeks, and has shoal grounds making out from ½ to 3 miles. When about 6 miles to the southward of Smith's Point, the entrance to great Wicomico River and Great Wicomico River Light-house are passed; coasters seeking anchorage frequently enter the mouth of this river.

To the eastward of the sailing-line Tangier Island, low, flat, and partly wooded, may be seen. It is left about 7 miles distant when abreast Great Wicomico River Light-house. To the southeastward of Tangier Island is the approach to Pocomoke and Tangier sounds. Shoals make out 1½ miles to 4½ miles from the western shore of Tangier Island.

Smith's Point Light-house, on the southern side of the entrance to the Potomac River, is about two miles off shore, near the edge of the shoal making off from Smith's Point; two buoys mark the edge of this shoal. An old light-tower, not now in use, is on the mainland of the point, and should not be mistaken for the present light-station.

Dangers.—**Old Plantation Flats** lie off the eastern shore of the bay, about 7 miles above Cape Charles, and have 8 feet of water over them. Old Plantation Flats Light-house is on the northern end of the flats and west of Old Plantation Creek. The shore to the northward of the light-house should be given a berth of 2¼ miles.

York Spit, making out from the western shore between York River and Mobjack Bay entrances, is marked by York Spit Light-house (see table of lights, page 16), which is about 1 mile inside the point of the spit. York Spit is fully described in Section I, "Sailing Directions, York River."

New Point (Middle Ground) Shoal is about 3¼ miles NE. by N. from York Spit Light-house. This shoal is fully described in Section I, "Sailing Directions, Mobjack Bay."

Wolf Trap Spit makes out 3 miles from the western shore of the bay, about midway between Mobjack Bay and Piankatank River entrances. The spit is marked near its eastern end by Wolf Trap Light-house, outside of which and marking the edge of the spit is a buoy (can, black, No. 7). The shore to the northward and southward of the light-house should not be approached closer than 2½ miles. To the northward of the light-house, distant about 3½ miles, there is at present (1889) an obstruction-buoy (can, red and black horizontal stripes), marking the wreck of a schooner; 1 mile to the northwestward of the obstruction-buoy is a black buoy (can, No. 7½), marking the edge of the shoal ground making off shore.

Rappahannock Spit makes out 4¼ miles in an ESE. direction from Windmill Point, the northern point of entrance to Rappahannock River; it is marked by Windmill Point Light-house (see table of lights, page 18) on the middle of the spit, and by a buoy (can, black, No. 9) placed near its eastern edge. A full description of the spit is given in Section I, "Sailing Directions, Rappahannock River."

Shoals extend out 3 miles from the western shore, about midway between Rappahannock River and Great Wicomico River entrances (see heading "Coast from Rappahannock River Entrance to Great Wicomico River Entrance"; these shoals have from 6 to 14 feet of water over them.

Tangier Island Shoal, with 10 to 15 feet of water over it, makes out nearly 5 miles to the westward from the southern end of the island, and is marked at its southwestern end by a buoy (nun, red, No. 10).

A spot with 22 feet of water over it lies about 8 miles S. by E. from Smith's Point Light-house and about 11 miles NNE. ½ E. from Windmill Point Light-house. There is also a spot with 24 feet over it 1¼ miles to the westward of the 22 feet spot. Deep-draught vessels (over 22 feet) should follow the directions for avoiding these shoal spots which lie on the sailing-line up the bay.

Smith's Point Shoal, at the southern point of entrance to the Potomac River, is described in Section I, "Sailing Directions, Potomac River."

4. ***From Smith's Point Light-house to Cove Point Light-house.***—With Smith's Point Light-house bearing **W.**, distant 1½ to 2 miles, shape the course **N NW.** for nearly 10 miles, until Point Lookout Light-house bears **W.**, distant 3¼ to 3¾ miles. Then change course to **N. ¾ W. Westerly**, and having run about 4 miles on this course, keep a bright lookout for Point No Point Shoal buoy (can, black, No. 11½), marking a 19-foot shoal spot, which should be on the port bow about 1 mile distant. The course made good for a little more than 21 miles should lead about 1¼ miles to the eastward of Cove Point Light-house. When Cove Point Light-house is made, shape the course so as to pass from ¾ to 1¼ miles to the eastward of it.

If beating—not drawing over 20 feet.—The western shore may be approached anywhere to within 1 mile, and closer in many places except off Point No Point. When Point Lookout Light-house bears to the westward of **NW.** by **W.**, keep Smith's Point Light-house bearing to the eastward of **S.** so as to avoid the shoal ground lying just to the eastward of the middle of the bay.

When Point Lookout Light-house has been brought to bear to the southward of **SW.** by **W.**, you may stand well over toward the entrance to Hooper's Straits and to within 2 miles of the western shore of Bloodsworth Island. The western shore of Hooper's Island should not be approached closer than 4½ miles, nor the western shore of Barren Island or western shore of the southern end of Taylor's Island nearer than 2 miles.

Remarks.—On the **N NW.** course the mouth of the Potomac River is passed on the port hand; on the north side of the entrance is Point Lookout Light-house (see table of lights, page 18). On the starboard hand, after making good about 6 miles on the **N NW.** course, Kedge's Straits (Middle Ground) is passed and left a little to the eastward of the middle of the bay. The western edge of this shoal has a general direction nearly parallel with the sailing-line. In the distance to the eastward is the line of low islands separating Tangier Sound from Chesapeake Bay. Holland's Island Bar Light-house will be left about 7 miles on the starboard hand.

On the **N. ¾ W. Westerly** course the Middle Ground just mentioned is left on the starboard hand. On the port hand St. Jerome's Creek entrance and Point No Point are passed. When well past Point No Point the western shore can be approached to within 1 mile, and in some parts much nearer, until abreast Cove Point Light-house; while the eastern part of the bay should be avoided, as extensive flats and shoals make out from the eastern shore. Cedar Point, 5¼ miles to the southward of Cove Point Light-house, will be left on the port hand. Just to the northward of Cedar Point is Patuxent River entrance; on the northern side of the entrance, and about two miles to the southward of Cove Point Light-house, is Little Cove Point and Little Cove Point Shoal buoy, colored and numbered as a starboard-hand buoy for vessels entering Patuxent River; when standing up the bay this buoy is left on the port hand. About 3¼ miles to the southwestward of Little Cove Point, on the northern side of the river, is Drum Point Light-house. Cove Point Light-house can be approached on its eastern side to within ¼ mile; inside of this the water shoals abruptly.

Dangers.—**Kedge's Straits Middle Ground** is a large irregular-shaped shoal, with 16 to 18 feet of water over it, lying a little to the eastward of the middle of the bay and about 6¼ miles to the eastward of Point Lookout Light-house. The southern end of this shoal bears **E SE.** from Point Lookout, and is marked by a buoy (nun, red, No. 12); the northern end, bearing **E NE. ½ E.** from Point Lookout Light-house, is also marked by a buoy (nun, red, No. 14). To avoid this shoal at night keep Smith's Point Light-house bearing to the eastward of **S.**

Smith's Point Shoal and **Point Lookout Shoal** are described in Section I, "Sailing Directions, Potomac River."

Point No Point Shoal makes out to the eastward from Point No Point, about 6 miles above Point Lookout Light-house; there is a spot with 19 feet of water over it 1¾ miles **SE.** by **E.** from the point. A buoy (can, black, No. 11½) is placed to mark this 19-foot spot off the eastern part of the shoal.

Shoals make out for a distance of 3¾ miles from the eastern shore (Hooper's Island, just north of Hooper's Straits), and also a little over 1 mile from the western shore of Barren Island. There are no aids to indicate these shoals, which in some places rise abruptly from the deep water of the bay.

5. ***From Cove Point Light-house to Thomas' Point Shoal Light-house.***—With Cove Point Light-house bearing **W.**, distant ¾ mile to 1¼ miles, shape the course **N.** by **W. ½ W.** The depth should not be less than 6 fathoms. Having made good the course **N.** by **W. ½ W.** for a little over 13½ miles, Sharp's Island Light-house should bear **NE.** by **E. ½ E.**, distant 4½ to 5 miles, the southern part of Sharp's Island should be about 3½ to 4 miles distant to the eastward, and the western shore should be about 2½ to 3 miles distant; depth 6 to 7 fathoms.

Now shape the course **N. ¼ E.** and make good this course about 10 miles, when Bloody Point Bar Light-house should bear about **NE. ¼ N.**, distant 5 to 5½ miles, the northern part of Poplar Island about **E. ¾ N.**, distant about 4 miles, and Poplar Island Shoal buoy (nun, red, No. 18) about **E SE. ¼ E.**, distant nearly 2 miles. From this position make good the course **N.** by **E. ¾ E.**, which being continued for about 4½ miles leads somewhat less than 2 miles to the westward of Bloody Point Bar Light-house, and being continued for nearly 4 miles farther leads somewhat more than 1 mile to the eastward of Thomas' Point Shoal Light-house.

When Thomas' Point Shoal Light-house is made, steer so as to give its southern side a berth of not less than $\frac{3}{4}$ mile, and pass about $\frac{3}{4}$ mile to 1 mile to the eastward of the Light-house.

If beating—not drawing over 20 feet.—Be guided by the remarks immediately following. There are no dangers lying in the middle of the bay, and it is only necessary to guard against approaching the shores too closely; the shoaling on the eastern side of the bay is very abrupt in places.

When abreast Poplar Island, if at night, do not stand to the eastward far enough to have Sharp's Island Light and Bloody Point Bar Light showing red at the same time; with one showing red and the other white, or both showing white, you will be clear of the shoals making out from the western shore of Poplar Island. To avoid the shoals which make out from the western shore below Thomas' Point Shoal Light-house, give the western shore a berth of $1\frac{1}{2}$ miles until Bloody Point Bar Light-house bears **E NE. $\frac{1}{2}$ E.**, then keep Thomas' Point Shoal Light showing white until it is passed.

In thick weather, standing from the westward toward the eastern shore, a careful use of the lead is necessary. A good rule is to go about when the water deepens over 10 fathoms. The deep water leads close along the shoals on the eastern shore.

Remarks.—From Cove Point Light-house until abreast Sharp's Island Light-house the western shore can be approached to $\frac{3}{4}$ mile by all but vessels of the heaviest draught; giving the shore a berth of 1 mile, the least water found will be 5 fathoms. The eastern shore should be given a berth of $1\frac{1}{2}$ miles.

When about 11 miles to the northward of Cove Point Light-house the entrance to Little Choptank or Hudson River is passed. Sharp's Island, to the northward of this entrance, is marked off its northern end by Sharp's Island Light-house. The southern approach to Choptank River leads to the eastward of Sharp's Island. The western side of Sharp's Island should not be approached closer than $1\frac{1}{2}$ miles on account of the shoals which rise abruptly from the deep water of the bay and extend nearly this distance from the island.

Plum Point, on the western shore, about 15 miles above Cove Point, has no marked natural features; the shoal making out $\frac{5}{8}$ mile to the eastward from the point is marked by a buoy.

The **N. $\frac{1}{4}$ E.** course passes the northern approach to Choptank River (north of Sharp's Island), and leaves Holland Point about 3 miles on the port hand. Holland Point should be given a berth of $1\frac{1}{2}$ miles when to the eastward and northeastward of it. Poplar Island is left about 3 miles on the starboard hand, and should not be approached closer than $1\frac{1}{2}$ miles from the westward.

When the course is changed to **N. by E. $\frac{3}{4}$ E.**, Eastern Bay Entrance, to the northward of Poplar Island, will be open broad on the starboard bow. The **N. by E. $\frac{3}{4}$ E.** course leads up the middle of the bay. Thomas' Point Shoal Light-house should be made on the port bow, and Bloody Point Bar Light-house will be left about 2 miles on the starboard hand. The bight in the western shore south of Thomas' Point Shoal Light-house, forming the entrances to West and South rivers, with its numerous shoals, can be avoided by keeping Thomas' Point Shoal Light-house bearing to the northward and westward of **N. by E.** When nearly up to Thomas' Point Shoal Light-house the entrances to West and South rivers will be passed.

The eastern shore above Bloody Point Bar Light-house should not be approached closer than 1 mile, as the water shoals very abruptly from 12 fathoms to 9 feet about $\frac{9}{10}$ mile from the shore in some places.

Dangers.—**Shoals** with 9 to 13 feet of water over them make out $1\frac{3}{4}$ miles to the westward from James Point, the southern point of entrance to Little Choptank or Hudson River, and about 8 miles above Cove Point Light-house.

Sharp's Island Shoal extends nearly $1\frac{1}{2}$ miles off the western shore of Sharp's Island, and has $9\frac{1}{2}$ feet of water near its outer edge. The western edge of the shoal, abreast the southern end of the island, is marked by a buoy (nun, red, No. 16). The southern point of this shoal is $1\frac{3}{8}$ miles south of the island, and Sharp's Island Light-house is near the northern end of the shoal. A wreck lies about 2 miles **W. by S.** from Sharp's Island Light-house, and is marked by a horizontal-striped buoy placed just to the westward of it.

Plum Point Shoal extends out about $\frac{5}{8}$ mile to the eastward from Plum Point. It is marked at its eastern edge by a buoy (spar, black, No. $11\frac{3}{4}$).

Holland Point Shoal extends nearly $1\frac{1}{4}$ miles to the eastward from Holland Point (the southern point of entrance to Herring Bay), and has 11 feet of water at its eastern end. The eastern edge of the shoal is marked by a buoy (can, black, No. 13); there is also a buoy (can, black, No. 1) placed to mark the northern point of the shoal and the channel into Herring Bay. The shore, for a distance of $2\frac{1}{2}$ miles to the southward of Holland Point, should not be approached closer than $1\frac{1}{2}$ miles on account of shoal water.

Poplar Island Shoal has 8 to 12 feet of water over it and extends nearly $1\frac{1}{2}$ miles from the western shore of Poplar Island, where it is marked by a buoy (nun, red, No. 18), which bears **S. by W. $\frac{3}{8}$ W.** from Bloody Point Bar Light-house, distant nearly 5 miles. This shoal is covered by the red rays of Sharp's Island and Bloody Point Bar light-houses. Poplar Island is surrounded by shoals; north of the island is the entrance to Eastern Bay.

The shoal making off from Kent Point, the northern point of entrance to Eastern Bay, is marked near its western edge by Bloody Point Bar Light-house (see table of lights page 18).

Horseshoe Point Shoal makes out $1\frac{3}{8}$ miles to the eastward from Horseshoe Point, the point on the western shore opposite Bloody Point Bar Light-house. This shoal has 2 to 8 feet of water over it, and is marked at its eastern edge by a buoy (can, black, No. 15) which bears **W. $\frac{1}{2}$ N.**, distant $3\frac{1}{4}$ miles from Bloody Point Bar Light-house.

Thomas' Point Shoal extends in an **E SE.** direction nearly $1\frac{1}{4}$ miles from the point, and has 7 feet of water over it. Near the end of the shoal is the light-house (see table of lights page 18); marking the edge of the shoal is a buoy (can, black, No. 17). The shoal extends about $\frac{3}{8}$ mile to the northward, and the same distance to the southward of the light-house.

The bight between Horseshoe Point and Thomas' Point (entrance to West and South rivers) is full of shoals with less than 18 feet of water over them; some of these shoals are marked by buoys placed for entering the rivers.

6. ***From Thomas' Point Shoal Light-house to Patapsco River (Baltimore Harbor) Entrance.***—Passing from ¾ to 1 mile to the eastward of Thomas' Point Shoal Light-house, continue the course **N.** by **E.** ¾ **E.** This course made good for a little more than 7 miles leads about ½ to ¾ mile to the eastward of Sandy Point Light-house.

If bound to Baltimore, follow the directions given under the heading "Patapsco River and Baltimore Harbor."

If bound up the bay above the Patapsco River, follow the directions given under the heading "Chesapeake Bay, above the Patapsco River."

If beating—do not stand nearer than 1¼ miles of the eastern shore, nor to the westward of a line joining Thomas' Point Shoal Light-house and Sandy Point Light-house. At night do not stand far enough to the westward to have both of the above-mentioned lights showing red at the same time; with one showing red and the other white, or both showing white, the shoals making out from the western shore will be avoided.

Remarks.—The eastern shore, between Bloody Point Bar Light-house and Love Point, makes out shoal in parts and must be given a berth of about 1¼ miles, depths of 9 and 11 feet being found about 1 mile off shore in places, the water shoaling abruptly. There are no buoys along this part of the eastern shore.

The western shore makes out shoal for a long distance in some places. Buoys mark the outer edge of the shoals. Nearly 2 miles **N.** by **E.** from Thomas' Point Shoal Light-house is Tally's Point Shoal buoy. Just to the northward of this is Annapolis Roads, forming the approach to Severn River and Annapolis Harbor, the entrance being marked by Greenbury's Point Light-house and by several buoys. On the northern side of Annapolis Roads and about 2⅞ miles **N NE.** from Tally's Point is Hackett's Point. From Hackett's Point to Sandy Point the western shore should be given a berth of ¾ mile or more. Sandy Point Light-house is built on the outer part of the shoal making out from Sandy Point, and is nearly ½ mile off shore. To the northwestward of it, on the mainland, is an old light-house tower.

Dangers.—**Tally's Point Shoal** extends 1 mile in a **SE.** by **E.** direction from the point, and has 2 to 13 feet of water over it; the eastern end of the shoal is marked by a buoy (can, black, No. 19).

Hackett's Point Shoal makes out about 1 mile in a southerly and southeasterly direction from Hackett's Point, and has 2 to 15 feet of water over it. The southeastern edge of this shoal is marked by a buoy (can, black, No. 21).

Sandy Point Shoal makes off from Sandy Point and has 6 to 9 feet over it; the light-house is near the eastern part of the shoal. A wreck, marked by a horizontal-striped spar buoy, lies a little over ⅝ mile **S SE.** from the light-house.

HAMPTON ROADS.†

Hampton Roads, at the confluence of the Elizabeth, Nansemond, and James rivers, and opening into the extreme southwest corner of Chesapeake Bay, is one of the most important anchorages in the United States. Many vessels come here seeking and for orders, and vessels bound up and down the coast make this the principal harbor of refuge between Delaware Bay and Cape Hatteras. The entrance, from the bay, is 15 miles **W NW.** ½ **W.** from Cape Henry Light-house, and is about 2 miles wide between Old Point Comfort on the north and Willoughby's Sandspit on the south, but the shoals on its southern side contract the channel, between Old Point Comfort and Fort Wool (Rip Raps), to a width of about ¾ of a mile. The width of the roads increases inside the entrance, but the channel has nowhere a greater width than 2 miles owing to the extensive shoals and flats which make out from the shores. Vessels of the largest size can enter and find good anchorage.

Fortress Monroe is a military post and village on the north side of the entrance to Hampton Roads; it is also known as **Old Point Comfort**, and is a much frequented seaside resort. The steamers of several lines plying in Chesapeake Bay and its tributaries make a landing at Fortress Monroe.

The town of **Hampton**, on the west bank of **Hampton Creek**, is about 2 miles **NW.** from Fortress Monroe. The town has some trade in coal, lumber, ice, and farm produce, carried in vessels of 10 feet or less draught; small steamers also make regular trips to Hampton. The bar at the entrance to Hampton Creek was improved, under the supervision of the U. S. Engineers, by dredging a channel 150 feet wide and 9 feet deep, but this depth has decreased somewhat, and in 1886 there was about 8 feet of water in the channel. Strangers should not enter the creek without a pilot; sailing-vessels sometimes tow up to the town.

Newport News, an important shipping point about 6 miles **W SW.** ¼ **W.** from Fortress Monroe, is on the northern point of entrance to James River. It has a large grain elevator, coal-bins, and cotton-sheds, and is the terminus of the Chesapeake and Ohio R. R. There is a sufficient depth of water alongside the wharves for vessels of the largest class.

† Shown on Coast and Geodetic Survey charts: **401a**, scale $\frac{1}{40,000}$, price $0.40; **403**, scale $\frac{1}{40,000}$, price $0.20; **131**, scale $\frac{1}{80,000}$, price $0.50; **376**, scale $\frac{1}{400,000}$, price $0.50.

Prominent Features.—Approaching Hampton Roads from the eastward, two light-houses (**Thimble Shoal and Old Point Comfort**) are guides to the entrance. The **Hygeia Hotel**, a large wooden structure on the southern end of Old Point Comfort, is a most prominent mark in the daytime. To the northward of the hotel is the fort (Fortress Monroe), and a little to the eastward is the light-house. **Fort Wool (Rip Raps)**, a low gray structure on the south side of the channel, is about ⅞ mile S. of Old Point Comfort Light-house. When entering the Roads the high dome of the Soldiers' Home in Hampton, to the northwestward, and the large grain elevator at Newport News, to the southwestward, will show distinctly. After entering the Roads, **Craney Island Light-house**, at the mouth of the Elizabeth River, will be seen to the southward, and **Nansemond River Light-house** to the southwestward. For a description of light-houses see page 16. At night a group of electric lights, just south of the elevator at Newport News, show prominently.

Channels.—Crossing the bay, the channel into Hampton Roads has a depth of 5 fathoms; to the westward of Thimble Shoals Light-house the depth increases and is from 6 to 14 fathoms until well inside Old Point Comfort. To the eastward of the entrance it leads between two extensive shoals, the Horseshoe on the north and Willoughby's Bank on the south; between these shoals its least width is ¾ mile. A channel with a depth of 16 feet, sometimes used by local pilots, leads south of Willoughby's Bank and close to the westward of Fort Wool (Rip Raps). This channel has no aids and should not be attempted by a stranger.

From the entrance, between Old Point Comfort and Fort Wool, the channel has a general **SW.** by **W.** direction for 4½ miles, with a width gradually increasing from 1 to 2 miles; it then turns more to the westward and is divided by Newport News Middle Ground, leaving a channel about 1 mile wide on either side of the latter. The best water (4½ fathoms) is found to the southward; lumps with 17 and 18 feet of water over them lie in the channel to the northward of the Middle Ground. The channel is well marked by buoys, and by Thimble Shoal and Old Point Comfort light-houses, the light-houses being the principal guides for making the anchorage at night.

A Time Ball is dropped daily (Sundays excepted) on the east tower of the Hygeia Hotel, Old Point Comfort, at noon of the 75th meridian, 5 *hours Greenwich mean time*. The dropping of this ball is regulated by the U. S. Naval Observatory, Washington, D. C. The ball is hoisted 5 minutes before noon; in case of no signal, the ball is lowered 5 minutes after noon.

The Wind Signals of the U. S. Signal Service are shown from the western end of the Hygeia Hotel, and can be seen by vessels entering or anchored in the Roads. For explanation of signals, see Appendix II.

Anchorages.—The larger class of vessels anchor anywhere in the channel inside of Fortress Monroe. Bay vessels and the smaller class of coasters frequently anchor in toward the north shore inside, and to the westward, of Hampton Bar, where there is good anchorage in 8 to 13 feet of water, soft bottom. The larger class of coasters anchor in the western part of the Roads near Newport News, and in the mouth of the James River.

Pilots for Hampton Roads and Newport News will be found cruising off or in the entrance of Chesapeake Bay. Strangers bound into Hampton Creek should take either a pilot or tow-boat. A Virginia pilot-boat is usually anchored off Hampton Flats. Pilotage is compulsory for all vessels other than a coasting vessel having a pilot license granted by the agents of pilots of the State of Virginia. For pilot laws and regulations, see Appendix I.

Tow-boats are not often used except by vessels in distress or by large square-rigged vessels with a head wind. Vessels bound up the James River to Richmond, up the Nansemond River to Suffolk, or up the Elizabeth River to Norfolk or Portsmouth, sometimes take a tow-boat from Hampton Roads. There is a tow-boat agency at Fortress Monroe through which tugs can be ordered, by telegraph, from Norfolk, Richmond, and Baltimore.

Repairs.—The large Simpson dry dock at Newport News (length 600 feet, draught over sill 25 feet,) can accommodate the largest vessels. The nearest place at which extensive repairs to the machinery of steamers can be made is Norfolk. There are 2 large dry docks at the U. S. Navy Yard, Norfolk, which might be used in case of emergency when not required by naval vessels. There are several marine railways at Norfolk.

Supplies.—Coal (bituminous) in unlimited quantities can be had, through chutes, from the coal wharf at Newport News and the coal pier at Lambert's Point. Quantities less than 50 tons are taken on board in wheelbarrows. Anthracite and bituminous coal can also be obtained at the wharves in Norfolk. Water can be had from Norfolk in a steam water-boat by telegraphing from Fortress Monroe or Newport News. Provisions and ship-chandler's stores can be had at Hampton, Newport News, and Norfolk. The latter place has an excellent market.

Tides and Tidal Currents.—The corrected establishment for Old Point Comfort (Fortress Monroe) is $8^h\ 46^m$, and the mean rise and fall of tides 2.5 feet. High water occurs at Newport News 21 minutes later than at Fortress Monroe, and the mean rise and fall is the same. The tidal currents turn about 1 hour earlier alongside the wharves at Fortress Monroe than in the channel; between Fort Wool and Fortress Monroe they have considerable velocity, which is somewhat influenced by the force and direction of the wind.

SAILING DIRECTIONS, HAMPTON ROADS.

1. ***Approaching and Entering.—From Seaward.***—In approaching Chesapeake Entrance, follow the directions under Section 1 or 1 A, pages 25–27.

Standing in to the northward of Cape Henry, pass about 1½ to 1¾ miles to the northward of the light-house, and shape the course **W NW. ⅜ W.** This course, made good about 8½ miles, leads up to

the Outer Mid-channel buoy (can, white and black perpendicular stripes), leaving the Junction and Tail of the Horse Shoe buoys about 1 to 1½ miles on the starboard hand. Continue the **W NW.** ⅜ **W.** course about 4¼ miles, passing close to the Inner Mid-channel buoy (nun, white and black perpendicular stripes) and about ½ mile south of Thimble Shoal Light-house.

Currents.—It will be necessary to make an allowance for the tidal current, frequently of as much as ½ point more to the southward on the flood and ½ point more to the northward on the ebb.

When Thimble Shoal Light-house bears about **NE.** by **E.** ½ **E.**, steer **W.** ½ **S.** for Old Point Comfort Light-house and leave Willoughby's Spit buoy on the port hand. Approaching Old Point Comfort Light-house, turn more to the southward and steer **SW.** by **W.** so as to pass about midway between the light-house and Fort Wool. Continue the **SW.** by **W.** course into Hampton Roads, and anchor when 2½ to 3¾ miles inside of Old Point Comfort. Vessels of 12 feet draught or less may stand more to the westward without danger, but vessels of greater draught must be careful to avoid Newport News Middle Ground.

If bound to Norfolk, follow the directions under heading "Elizabeth River (Norfolk Harbor)."

If bound to Nansemond River, follow the directions under heading "Nansemond River."

If bound to Newport News, entrance to James River, follow the directions under Section 2 following.

Remarks.—On the **W NW.** ⅜ **W.** course Thimble Shoal Light-house (see table page 16) will be made a little on the starboard bow, and the Hygeia Hotel and Old Point Comfort Light-house on the port bow. As Thimble Shoal Light-house is approached, **Fort Wool** (Rip Raps), a low gray stone structure nearly 1 mile to the southward of Old Point Comfort Light-house, will be distinguished, and the houses of the town of Hampton will show over the land nearly ahead (see view). To the southward the shore of Chesapeake Bay, between Cape Henry and Hampton Roads, is comparatively low, with small hillocks, and is backed by thick woods; it presents no marked natural features. About 12 miles from Cape Henry Light-house, and at the entrance of Hampton Roads, the shore terminates in **Willoughby's Sandspit**, a long point behind which is a large shallow bay.

Steering **W.** ½ **S.** for Old Point Comfort Light-house (see table page 16) the large elevator at Newport News will show in the distance to the southward of Old Point Comfort. On the **SW.** by **W.** course into Hampton Roads, Nansemond River Light-house (see table page 16) will be ahead but not distinguished, unless at night, until well in the roads.

Dangers.—**Middle Ground and Tail of the Horse Shoe,** left on the starboard hand, are described under heading "Directions for entering Chesapeake Bay," Section 1, page 26, and Section 2, pages 27–28.

Crump's Bank, about 1½ miles in length **E.** and **W.**, has 17 and 18 feet of water on it. This shoal lies about 1¼ miles off the south shore of the bay and about 8 miles to the westward of Cape Henry Light-house; it is not marked. A detached spot with 18 feet over it lies about ½ mile to the eastward, and another about 1 mile to the northwestward of the bank.

The Horse Shoe is the extensive shoal, with 6 to 18 feet of water over it, making off from the shore between Old Point Comfort and Back River Entrance. The eastern half of the shoal has from 13 to 18 feet of water over it, the western not less than 6 feet, till within ⅝ mile of the shore. The southern edge of the shoal runs almost in a straight line 5¼ miles **E.** ½ **N.** from Old Point Comfort Light-house, and along the north side of the channel into Hampton Roads; about midway along this edge is Thimble Shoal Light-house (see table page 16) placed on **Thimble Shoal**, a spot with 10 to 11 feet of water over it. The eastern edge is irregular, extending in a general **SE.** by **S.** direction from off Back River Entrance for a distance of 5 miles; a buoy (nun, red, No. 2) is off the southeastern end of the shoal and bears **E SE.** ⅝ **E.**, distant 4⅝ miles from Thimble Shoal Light-house. Vessels of not over 12 feet draught may, in smooth weather, cross the shoal, passing ½ mile to the eastward of Thimble Shoal Light-house and keeping it bearing to the westward of **S.** by **W.** ½ **W.** Vessels of less than 7 feet draught may insure safety by keeping 1¼ miles from the shore.

Willoughby's Bank is on the south side of the channel into Hampton Roads. From Fort Wool (Rip Raps) it extends 2½ miles in an **E NE.** ½ **E.** direction, where its northern edge is marked by a buoy (can, black, "Willoughby's Spit" in white letters); from thence the bank extends in a general southeasterly direction for 2¼ miles, and is about ¾ miles wide at its widest part. It lies about 1¾ miles from the south shore, and nearly parallel to it and to Willoughby's Sandspit. The part of the bank to the eastward of the buoy has 14 to 18 feet of water over it, and the part to the westward of the buoy has 3 to 13 feet.

Just to the southward and westward of Fort Wool is a narrow channel with a depth of 16 feet, which leads south of Willoughby's Bank. This channel is sometimes used by local pilots; it is unmarked.

Sewall's Point Shoal makes out to the northward and eastward from Sewall's Point, and extends nearly to Fort Wool. It has from 2 to 7 feet of water over it, and is marked at its western edge, nearly midway between Fort Wool and Sewall's Point, by a buoy (can, black, No. 3) and a black bell buoy.

Shoal ground with 3 to 7 feet of water over it makes out to the northwestward from Willoughby's Sandspit, joining the end of Sewall's Point Shoal just to the southwestward of Fort Wool. The 16-foot channel south of Willoughby's Bank leads between this shoal ground and Fort Wool.

Hampton Bar has 2 to 5 feet of water over it and lies on the north side of the channel off the mouth of Hampton Creek and just to the westward of Old Point Comfort. The bar is about 2 miles long in a **SW.** by **W.** and **NE.** by **E.** direction, and a little over ¼ mile wide at its widest part. Between its eastern end, marked by a buoy (can, red and

Entrance to Hampton Roads, Thimble Shoal La.Ho. bearing N.W. ¾ W. distant 2¼ Miles.

Entrance to Elizabeth River, Craney Island La.Ho. bearing S.¾ E. distant 4½ Miles.

Entrance to James and Nansemond Rivers, Newport News Pt. bearing W. ¼ S. distant 3 Miles.

black horizontal stripes), and the wharves at Old Point Comfort, a narrow channel leads to an anchorage in 8 to 9 feet water behind the bar. The southwestern end of the bar is marked by a buoy (nun, red and black horizontal stripes), which bears **SW.** by **W.** ¾ **W.**, 2⅝ miles from Old Point Comfort Light-house. The water shoals abruptly on the channel side of the bar.

In the bight between Old Point Comfort and Newport News are **extensive shoals** which rise abruptly from the channel and have a general depth of 8 to 12 feet of water over them. These shoals fill the whole bight and are much used as an anchorage for the smaller class of coasters entering the Roads for refuge. On the edge of this shoal ground, and just to the eastward of Newport News Point, is Newport News Bar, with 3 to 5 feet over it.

The other dangers in Hampton Roads are described under Section 2 following.

1 A. ***Approaching and Entering.—From the Northward, coming down Chesapeake Bay.***—For convenience, the following directions are divided into paragraphs to suit different draught vessels.

I. ***Vessels of 18 feet or less draught.***—Standing down the bay, shape the course so as to pass from 4½ to 6 miles to the eastward of Back River Light-house, and when it bears **W.** steer **S.**, until Thimble Shoal Light-house bears **W.** by **N.**, and then steer **W.** ½ **N.** so as to pass ¼ to ½ mile south of it. When abreast Thimble Shoal Light-house steer for Old Point Comfort Light-house, course **W.** ¼ **S.**, and continue as directed in Section 1 preceding.

II. ***Vessels of 22 feet draught*** should have no trouble in passing between the Horse Shoe and the Tail of the Horse Shoe in the daytime with clear weather, as there is a channel about 1 mile wide with a least depth of 4 fathoms. Standing down the bay, pass close to the Turn of Channel buoy (bell) and steer **S.** ¼ **W.** This course should lead 1 mile to the westward of Tail of the Horse Shoe north end buoy (spar, black, No. 1½), and about ⅛ mile to the eastward of Horse Shoe Shoal buoy (nun, red, No. 2). When past the latter, steer **W NW.** ½ **W.** so as to pass ¼ to ½ mile to the southward of the light-house. When Thimble Shoal Light-house is on the starboard beam steer **W.** ¼ **S.** for Old Point Comfort Light-house, and follow the directions in Section 1 preceding.

See also the current note under paragraph 1 preceding, when standing to the westward.

III. ***Vessels of not over 12 feet draught*** may, when abreast of Back River Light-house, steer for Thimble Shoal Light-house on any course to the westward of **S.** by **W.** ½ **W.** across the eastern part of the shoal. Pass about ½ mile to the eastward of the light-house, haul to the westward, and steer **W.** ¼ **S.** for Old Point Comfort Light-house, then follow the directions in Section 1 preceding.

IV. ***Vessels of over 22 feet draught*** should keep in the main channel of the bay, pass close to Turn of Channel buoy (bell buoy), and steer **S SE.** ½ **E.** for Cape Henry Light-house. When within 3½ miles of the light-house turn to the westward, course **W NW.** ⅜ **W.**; leave Junction buoy ⅜ mile and Horse Shoe Shoal buoy ¼ mile on the starboard hand. The two Mid-channel buoys should be left on the port hand, and Thimble Shoal Light about ½ mile on the starboard hand. Then follow the directions in Section 1, for approaching and entering Hampton Roads "From Seaward" (pages 33–34). See also the current note on page 34.

Remarks.—When on the southerly course Thimble Shoal Light-house, the Hygeia Hotel, and Fort Wool will be on the starboard bow; Cape Henry Light-house, if visible, will be on the port bow. Standing down between Horse Shoe Shoal and the Tail of the Horse Shoe, when Thimble Shoal Light-house bears **W SW.** ¾ **W.**, Tail of the Horse Shoe north end buoy should bear **E NE.** ¾ **E.** Horse Shoe Shoal buoy should be made a little on the starboard bow. See also "Remarks" under Section 1.

Dangers.—**Tail of the Horse Shoe** (17 feet of water), lying 5½ miles **E.** of Thimble Shoal Light-house, is described under heading "Sailing Directions, Chesapeake Bay, Section 2," page 28.

The Horse Shoe and dangers entering Hampton Roads are described under Section 1 preceding.

2. ***From Old Point Comfort to Newport News.***—Having followed the directions under Section 1 or 1 A preceding.

I. *To pass South of the Middle Ground with a draught of over 15 feet.*—When on the **SW.** by **W.** course into Hampton Roads Old Point Comfort Light-house bears **NE.** ¼ **N.**, steer **SW.** ¼ **S.**, keeping the bearing. Continue the **SW.** ¼ **S.** course until Craney Island Light-house bears **S SE.**, or Newport News Middle Ground east end buoy (can, red and black horizontal stripes) is on the starboard beam, distant about ½ mile, when the course should be changed to **W.** by **S.**, with the northern end of Sewall's Point astern. When the elevator at Newport News bears **N NW.** ½ **W.**, change the course to **NW.** ¾ **N.** so as to leave the wharves at Newport News about ¼ to ½ mile on the starboard hand.

Come to anchor in the channel to the southwestward of the elevator, or if bound up the James River follow the directions under heading "James River," Section 1.

II. *To pass North of the Middle Ground with a draught of less than 15 feet.*—Continue the **SW.** by **W.** course about 4 miles past Old Point Comfort Light-house until Newport News Middle Ground east end buoy (can, red and black horizontal stripes) is from ¼ to ½ mile distant a little forward of the port beam, or when Craney Island Light-house bears **S SE.** Now steer **W.** ¼ **N.**, and round Newport News Point at a distance of ⅜ to 1 mile. Anchor when the elevator bears **NE.**, or if bound up the James River follow the directions under that heading.

Remarks.—The **SW.** ¼ **S.** course and **SW.** by **W.** course leave Sewall's Point Shoal buoy on the port hand and pass south of Hampton Bar. Elizabeth River Entrance, Craney Island, and Lambert's Point light-houses will be seen to the southward on a clear day or at night. Nansemond River Light-house (see table page 16) will be made ahead, or a little on the starboard bow, and the large buoys in the middle of the Roads, marking Newport News Middle Ground, will be easily distinguished. (A light-house is to be built on Newport News Middle Ground.) Passing south of the Middle Ground, the two entrance buoys to Nansemond River (spar buoys, white and black perpendicular stripes) will be seen and left on the port hand. The course north of the Middle Ground leaves Newport News Bar and the buoy on its western end (spar, red and black horizontal stripes) on the starboard hand.

At night, when Craney Island Light-house bears **SE.**, a **NW.** course, keeping the light on the bearing, will lead clear of the western end of the Middle Ground and into James River, past Newport News. The group of electric lights south of the elevator at Newport News should be a little on the starboard bow.

Dangers.—**Craney Island Flats**, an extensive shoal extending out 2 to 3 miles from Craney Island and the shore to the westward, fill the bight between Sewall's Point and Nansemond River Entrance, leaving only a narrow channel into Elizabeth River and a channel about 1 mile wide to the southward of Newport News Middle Ground. This shoal is more fully described under heading Elizabeth River (Norfolk Harbor).

Newport News Middle Ground, at the junction of Hampton Roads and the James River, is 1¼ miles long in an **E.** and **W.** direction, nearly ⅜ mile wide, and has 15 to 17 feet of water over it. The eastern and western ends are each marked by a buoy (first-class can, red and black horizontal stripes). The buoy on its eastern end bears **SW.** ¼ **W.** from Old Point Comfort Light-house, distant 4½ miles. The western buoy bears **SE.** ½ **S.** from the western end of the elevator at Newport News, distant about 2½ miles. There is a channel on either side of the Middle Ground about 1 mile in width. A light-house is to be built on the Middle Ground.

Newport News Bar extends about 1 mile along the southern edge of the shoal lying in the bight between Old Point Comfort and Newport News, described under Section 1. This bar has from 3½ to 5½ feet of water over it; about ⅜ mile **SE.** by **E.** from Newport News Point is a buoy (spar, red and black horizontal stripes). A narrow channel, with 10 feet of water, leads between the western end of the bar and Newport News Point.

Naseway Shoal is described under heading "James River," Sailing Directions, Section 1. This shoal extends to the northward from the mouth of the Nansemond River, leaving the channel off Newport News Point only 1 to 1½ miles in width. The water shoals abruptly on the edge of this shoal.

ELIZABETH RIVER AND NORFOLK.†

The Elizabeth River, emptying into Hampton Roads from the southward, is important as the approach to the cities of Norfolk and Portsmouth, the town of Berkley, the U. S. Navy Yard, and the Albemarle and Chesapeake, and Dismal Swamp canals. These canals afford communication by water from Chesapeake Bay to the sounds and inland waters of North Carolina. Vessels of 25 feet draught can go up to Norfolk and the Navy Yard (see **Channels**, following). A draught of 13 feet can be taken up the Southern Branch about 2½ miles above the Navy Yard, and 8 feet into and through the Albemarle and Chesapeake Canal.

Tanner's Creek is in the eastern shore about 2¾ miles to the southward of Sewall's Point; the entrance is about **NE.** by **E.** ½ **E.** from Craney Island Light-house. This creek has from 9 to 22 feet of water in the channel for a distance of 3 miles above its mouth, but the entrance is obstructed by a bar with about 6 feet of water. Only small vessels engaged in the bay trade enter the creek, from which considerable farm produce is shipped. There are no aids to assist a stranger in entering.

Elizabeth River has three tributaries or branches; these receive numerous small creeks and streams, none of which are of commercial importance. The **Western Branch** makes in to the westward, about 2 miles to the southward of Craney Island Light-house. It has a narrow channel, with a depth of 13 feet up to the bridge which crosses the branch about 1½ miles above its mouth; a depth of 8 feet can be carried 2 miles above the bridge. Several buoys and a beacon mark the channel at the entrance. The vessels entering are principally small oyster-boats and vessels engaged in carrying farm produce. The **Eastern Branch** makes in to the eastward at the city of Norfolk, the water front of the city extending some distance along the north shore of the branch. It is of some commercial importance, and is crossed by three bridges just above Norfolk. A channel 21 feet deep and 200 feet wide has been dredged up to the Norfolk and Western Railroad bridge. A draught of 12 feet can be taken 3 miles above the lower bridge, but the channel is quite narrow and is not marked. The **Southern Branch** has the city of **Portsmouth** and the **U. S. Navy Yard** on its west shore; it is also the approach to the **Albemarle and Chesapeake Canal** and the **Dismal Swamp Canal.** This branch has considerable trade; lumber, firewood, and naval stores are brought through the canals, and from landings on the branch and its tributaries. The channel is narrow and crooked, and is buoyed as far as the locks of the

† Shown on Coast and Geodetic Survey charts: **404**, scale $\frac{1}{10,000}$, price $0.50; **403**, scale $\frac{1}{40,000}$, price $0.20; **131**, scale $\frac{1}{80,000}$, price $0.50.

Albemarle and Chesapeake Canal, about 14 miles above the city of Portsmouth, but a stranger should not attempt to pass above the Navy Yard without a pilot, on account of the numerous shoals and bars. A depth of 10 feet can be carried up nearly 5 miles above Portsmouth. The **Albemarle and Chesapeake Canal** affords a passage for vessels 208 feet long over all, 39 feet wide, and 8 feet draught. The **Dismal Swamp Canal** affords a passage for vessels 96 feet long, 16 feet wide, and a draught of 5 feet. The distance to Albemarle Sound through either of these canals is nearly equal (about 63 miles).

Norfolk is a thriving commercial city on the eastern shore of the river, about 7 miles above Sewall's Point and 3½ miles above Craney Island. It has a large foreign trade in cotton, and a coasting trade employing several lines of steamers and sailing-vessels of every description. Norfolk is one of the important ports in the United States for the shipment of cotton and naval stores; it is the terminus of several railroads, and has ferry communication with Portsmouth and Berkley.

Portsmouth, on the west shore of Elizabeth River at its junction with the Southern Branch, is a city of considerable commercial importance. It is a railroad terminus, and has a large cotton-shipping business, both foreign and coastwise.

Berkley is a small town opposite Norfolk and Portsmouth, on the point separating the Eastern and Southern branches. It has some trade in lumber. Communication with Norfolk is carried on by means of a ferry and bridge.

The U. S. Navy Yard is on the western shore of the Southern Branch, at the upper end of the city of Portsmouth.

Prominent Features.—The mouth of Elizabeth River is at the southeastern end of Hampton Roads, and just to the westward of Sewall's Point; its western point of entrance, Craney Island, is marked by **Craney Island Light-house** (see table page 16). Making out from the eastern shore, about 1½ miles above Craney Island, is the **large pier and coal pockets** of the Norfolk Terminal Railroad; this is the most prominent mark, and can be seen when in Hampton Roads. **Lambert's Point Light-house** (see table page 16) is at the end of the pier. About 2¼ miles above Lambert's Point Light-house, on a wharf on the west shore opposite the city of Norfolk, is a tall mast from which a light is shown; this is **Naval Hospital light** (see table page 16). **Fort Norfolk** is a low, white stone work on the eastern shore, about 1¾ miles above Lambert's Point, and east from the long pier at Pinner Point.

Channels.—There is but one channel into the Elizabeth River; this is narrow, but well buoyed as far as Norfolk. It leads from Sewall's Point for 3½ miles along the eastern edge of Craney Island Flats, and then takes a nearly mid-river course, between extensive shoals, to the city of Norfolk. Along its length, from the entrance to the city, the buoys are placed close enough to be readily recognized in daylight. Dredging is in progress, under the supervision of the U. S. Engineers, deepening and widening the channel to accommodate the larger class of vessels. In April, 1889, the depth in the dredged channel from Sewall's Point to the city of Norfolk was 25 feet, and its width abreast Sewall's Point was 250 feet. The deepest draught ordinarily, entering the port, is 23 feet, but a draught of 25 feet 7 inches has been taken out. The channel of the Southern Branch above the Navy Yard is narrow and crooked, and although buoyed to the entrance of the Albemarle and Chesapeake Canal, should never be attempted by a stranger without a pilot.

Anchorages.—The channel between Sewall's Point and Norfolk is too narrow for large vessels to anchor. The usual custom is to anchor in Hampton Roads and await there a fair wind and tide, or tow to the wharves of Norfolk or Portsmouth. In case of necessity vessels anchor in the channel, leaving a passage-way for passing vessels. Vessels of light draught sometimes anchor in the entrance of Western Branch, and on the flats opposite the coal pier at Lambert's Point. See also Harbor Regulations, following, and Appendix I.

Pilots.—Pilotage is compulsory for all vessels except those that have a license (see Pilot Laws, Appendix I). Pilots for Norfolk and Portsmouth will be found cruising off the entrance, or just inside Chesapeake Bay, and can also be had at Old Point Comfort (Fortress Monroe), where a Virginia pilot-boat will usually be found.

Tow-boats are generally used by the larger class of vessels and are taken in Hampton Roads. If not found cruising in the Roads they may be ordered at the tow-boat agency at Old Point Comfort (see also page 15).

Quarantine for the District of Elizabeth River is under the control of a Board of Quarantine Commissioners. Between the 1st of May and the 1st of November following, all vessels arriving in the river from ports to the southward of the latitude of Cape Lookout, or which may have visited such ports within 30 days, are subject to visitation by the Quarantine Medical Officer. During the whole year, all vessels from a foreign port and vessels from any port where infectious or contagious diseases are epidemic, or, having touched at any such port within 30 days previous to their arrival, and all vessels with any cases of infectious or contagious disease on board, are subject to visitation by the Quarantine Medical Officer.

Vessels subject to quarantine are forbidden communication with the shore, other vessels, or boats, without written permission from the Quarantine Medical Officer. Vessels entering Elizabeth River from Hampton Roads, subject to visitation by the Medical Officer, will stop at the Quarantine Anchorage opposite Craney Island until boarded. Vessels entering via the canals are subject to the above regulations, and will stop at or near Burton's Point, above the Navy Yard, until boarded by the Quarantine Medical Officer.

All licensed Virginia pilots are required to furnish masters of incoming vessels a copy of the Quarantine Regulations for Elizabeth River.

Harbor Regulations.—The Harbor Masters of Norfolk and Portsmouth have control of the berthing of all vessels, and designate the anchorage grounds for vessels. They act together in all cases for both cities. For Harbor Regulations and Harbor Master's fees, see Appendix I.

Wharves.—The facilities for docking vessels at Norfolk and Portsmouth are good. There is sufficient water alongside the principal wharves for the heaviest draught vessels that can enter the river. The facilities for loading and unloading vessels are good.

Supplies of all descriptions can be obtained at Norfolk. Coal for steamers can be had alongside the wharves or out in the stream in lighters. Bituminous coal in unlimited quantities can be had alongside the coal pier at Lambert's Point, where there is a depth of 24 to 26 feet; quantities less than 50 tons are put on board in wheelbarrows, quantities over 50 tons are put on board through chutes from the coal pockets.

Repairs.—Machinery of steamers and repairs to hulls of vessels can be made at Norfolk. There are 7 marine railways; the largest is 240 feet long, 50 feet broad, and 9 feet draught, capable of taking out a vessel of 800 tons; the next in size will take out a vessel of 650 tons; the others are smaller. The stone dry dock at the Navy Yard, 360 feet long, and a Simpson dock, 500 feet long, are available for large vessels in case of emergency, when not required by naval vessels, upon application to the Navy Department.

Wind Signals of the U. S. Signal Service are displayed from the end of the coal pier at Lambert's Point, and at the U. S. Signal Service Station, Nos. 53 and 55 Main street, Norfolk, where the communications from the Sea-coast Telegraph Station at Cape Henry are received and forwarded.

Tides.—It is high water at the Navy Yard 17 minutes after high water at Fortress Monroe. The mean rise and fall of tides is 2.7 feet; the mean rise and fall of spring tides is 3.1 feet, and of neap tides 2.4 feet.

Ice.—In severe winters the Southern Branch is closed by ice down to the Navy Yard. Drift-ice will sometimes be found abreast the pier at Lambert's Point when the river is free of ice both above and below the pier. The harbor is generally free of ice, and navigation is never obstructed.

SAILING DIRECTIONS, ELIZABETH RIVER, NORFOLK HARBOR.

Strangers should not attempt to enter the river unless the buoys can be plainly seen; sailing-vessels must have a fair wind.

From Hampton Roads to Norfolk.—Having entered Hampton Roads as directed in Sections 1 or 1 A, pages 33–35, when Old Point Comfort Light-house bears **NE. ¼ N.** and Fort Wool about **E. by N.**, steer **S. by W. ¾ W.**, leaving Sewall's Point Shoal buoy (can, black, No. 3) and the bell-buoy about 60 yards to the northeastward of it, on the port hand. Craney Island Flats buoy (nun, red, No. 2½) will be made nearly ahead, and should be left on the starboard hand. Follow the red buoys, course about **S. ½ W.**, leaving them about 100 to 200 yards on the starboard hand. Passing Craney Island Light-house, which is left on the starboard hand, continue to follow the buoys, and leave Lambert's Point Light-house about 250 yards on the port hand.

After passing Lambert's Point Light-house, steer a little more to the eastward—the channel off the entrance of the Western Branch is about 150 yards wide—and head for the wharves of Norfolk, leaving the red buoys on the starboard hand and the black buoys on the port hand. Anchor on the edge of the channel; or, go alongside the wharves.

If desiring to pass up the South Branch above the Navy Yard, take a pilot or tow-boat.

Remarks.—**Sewall's Point**, the eastern point of entrance to the river, shows bare faces of sand backed by trees; a landing extends out from the shore just below the point. When heading southerly along the line of the red buoys, Craney Island Light-house and the coal pier at Lambert's Point will be the prominent features ahead; the coal pier somewhat obscures Lambert's Point Light-house until close up to the pier. When nearly up to Craney Island, the entrance to Tanner's Creek will be opened to the eastward. After passing the pier at Lambert's Point, the Western Branch will be gradually opened to the southwestward; the U. S. Naval Hospital will be seen a little on the starboard bow, and the city of Norfolk will be ahead.

Dangers.—**Shoals** make out from the shore from ¼ to 1 mile to the edge of the channel between Sewall's Point and Lambert's Point, rising abruptly from the edge of the channel. Bush's Bluff Shoal buoy (can, black, No. 5), 1¼ miles N. of Craney Island Light-house, marks the western edge of these shoals. Lambert's Point Shoal buoy (can, black, No. 7), about ⅝ mile NNW. from Lambert's Point Light-house, marks the eastern edge of the channel, where the water shoals abruptly from 6 fathoms to 4 or 5 feet.

Craney Island Flats, the extensive shoal ground making out about 3 miles to the northward from Craney Island and the shore to the westward, have from 1 to 18 feet of water over them; the general depth on the flats is 9 to 11 feet. The eastern edge of these flats rises abruptly from the deep water of the channel into Elizabeth River, but is well marked by a number of red spar and nun buoys. From the northeastern point of the flats (which is about 3 miles N. from Craney Island Light-house), the northern edge, bordering on Hampton Roads, curves to the southward and then to the westward to the entrance of the Nansemond River. The shoaling is gradual on the northern side of these flats.

Shoals extend out ½ mile all along the shore between Craney Island and Lovett Point (the northern point of entrance to Western Branch), and rise very abruptly from the channel. A red nun-buoy (No. 22) marks the eastern edge of these shoals.

Western Branch Shoal is off the entrance of Western Branch, about ½ mile to the southward of Lambert's Point Light-house. This shoal is in the narrowest part of the channel, and its eastern edge is marked by a buoy (nun, red, No. 24); it has 8 to 9 feet of water over it in spots.

Fort Norfolk Flats make out from the eastern shore, between Lambert's Point and Fort Norfolk; they rise abruptly from the edge of the channel and have a depth of 2 to 5 feet of water over them. The edge of these flats is marked by 4 black can-buoys, Nos. 9, 11, 13, and 15. The channel along the edge of these flats is being improved by dredging. Buoy No. 9 is to the northwestward of the coal pier at Lambert's Point and marks a change in the direction of the channel to the eastward.

Two red nun-buoys mark obstructions on the western side of the channel off the mouth of the Western Branch and just above Western Branch Shoal buoy; they are numbered 26 and 28 respectively.

Pinner Point Flats extend ¼ mile to the eastward and northeastward from Pinner Point (the southern point of entrance to Western Branch, opposite Fort Norfolk). The greater part of this shoal is dry at low water, and its eastern edge is marked by a buoy (nun, red, No. 30). Dredging is in progress on the eastern edge of these flats, off the long pier making out from Pinner Point.

Shoals with 3 or 4 feet of water over them fill the entrance to **Scotch Creek** (an unimportant stream on the west side of the channel, between Pinner Point and Naval Hospital Point). These shoals rise abruptly from the edge of the channel.

The bight between Naval Hospital Point and the city of Portsmouth has only 1 to 4 feet of water. The channel favors the Norfolk shore until the Southern Branch is opened out.

NANSEMOND RIVER.†

Nansemond River flows into the southwestern part of Hampton Roads, and is the approach, by water, to the town of Suffolk. This river is navigable 19 miles, at high water, for vessels of 11 feet draught, but the channel is narrow and crooked, and although it is buoyed a stranger should not go above the light-house, at the entrance, without a pilot or tow-boat. At Suffolk, just below the head of navigation, the river is crossed by a draw-bridge. Under the supervision of the U. S. Engineers the river is being improved by dredging. Nansemond River has considerable trade in lumber, firewood, farm produce, and merchandise, carried principally in vessels that are owned elsewhere. The river has several tributaries, creeks of little commercial importance, which are used only by small craft trading to Norfolk and vicinity.

Suffolk is a thriving town, near the head of navigation, 18½ miles above the mouth of the river; it has a large trade in lumber, firewood, and merchandise. Two railroads pass through the town and two others terminate here. Steamers of the Old Dominion Line make daily trips between Norfolk and Suffolk, stopping at landings on the Nansemond River.

The **Prominent Feature** in approaching the entrance is **Nansemond River Light-house** (see table, page 16), which is off **Pig Point**, the eastern point of entrance. Bearing **N.** by **E.** ¼ **E.** from the light-house is the large grain elevator at Newport News. See also "Prominent Features" under heading Hampton Roads.

The **Channel** across the bar at the entrance has a depth of 16 feet and is marked by buoys and Nansemond River Light-house. Inside the bar the channel is narrow and has a depth of 3 to 5 fathoms, leading between shoals which make out from both shores. Above Town Point, on the eastern shore, about 4 miles above the light-house, the channel begins to shoal, and from the point up to Suffolk are numerous shoals, some of which are being removed by dredging.

Anchorages.—The usual anchorage for vessels bound into the river and waiting for a favorable wind and tide is in Hampton Roads. Good anchorage is found anywhere in the channel of the river where the bottom is soft. Strangers should not go beyond a point ¼ mile **W.** of the light-house at the entrance.

Tow-boats will be found at the mouth of the river or in Hampton Roads, and sailing-vessels generally take one, as the river channel is too narrow for a vessel to work in.

Supplies.—Coal for steamers can be had alongside the wharf at Suffolk. Provisions and ship-chandler's stores can be obtained in the town.

Repairs to hull can be made at Newport News and Norfolk (see headings "Hampton Roads" and "Elizabeth River").

Tides and Tidal Currents.—The mean rise and fall of tides at the mouth of the river is about 2.9 feet, and at Suffolk 3.8 feet; the time of high water at Suffolk is $1^h\ 11^m$ later than at the entrance. The currents between the entrance and Town Point have a tendency to set a vessel on the shoals and flats.

SAILING DIRECTIONS, NANSEMOND RIVER.

From Hampton Roads to an anchorage in the mouth of the river.—With Old Point Comfort Light-house bearing **NE.** steer **SW.**, and when Nansemond River Light-house is made, bring it to bear **W SW.** and steer for the light-house on this bearing. The **W SW.** course should lead to the entrance buoy (spar, white and black perpendicular stripes); pass close to the southward of this buoy and steer about **W SW.** ¾ **W.** until up to Inner Mid-channel buoy (spar, white and black perpendicular stripes); leave

† The entrance is shown on Coast and Geodetic Survey charts: 401a, scale $\frac{1}{40,000}$, price $0.40; 131, scale $\frac{1}{80,000}$, price $0.50.

this buoy close on the starboard hand, and steer about **SW.** by **W. ½ W.** so as to leave Pig Point Flats buoy (can, black, No. 1) about 100 yards and the light-house 200 yards on the port hand. Anchor abreast the light-house, or in the channel between the light-house and Wills John Shoal buoy (spar, red, No. 2), which is on the eastern edge of the shoals making out from Barrel Point and about ¾ mile above the light-house.

If desiring to proceed up the river, take a pilot or be guided by the buoys. The channel is narrow and the shoals rise abruptly on either side.

Remarks.—On the **SW.** course, Newport News Middle Ground east end buoy (can, red and black horizontal stripes) will be made on the starboard bow and left about ⅜ mile on the starboard hand. If Nansemond River Light-house is not made when the buoy bears abeam, steer about **W SW.** until the light-house is in sight, and then head for it, course **W SW.**; the entrance of the river will be ahead, and the course will lead between the shallow parts of Craney Island Flats to the eastward and Naseway Shoal to the westward of the entrance. **Pig Point**, the eastern point of entrance, slopes sharply toward the water and is wooded. **Barrel Point**, the western point of entrance, is wooded; the trees at the extremity of the point are lower and more straggling than farther back.

As the light-house is approached the ruins of a pier will be seen just above Pig Point, and about 1¼ miles above these ruins a long pier will be seen.

Dangers.—**Craney Island Flats**, on the eastern side of the entrance, is described under heading "Elizabeth River."

Naseway Shoal, on the western side of the entrance, is described under heading "James River."

Shoals extend out from Pig Point, the eastern point of entrance, and from Barrel Point, the western point of entrance to the river, leaving the channel ¼ mile wide for a distance of ½ mile above the light-house. Above this the channel is very much narrower in places.

JAMES RIVER†

empties into the western part of Hampton Roads at Newport News, and is the approach, by water, to the cities of Richmond and Petersburg and the towns of Smithfield and City Point. The river is navigable, for vessels of 16 feet draught, a distance of 87 miles, to the city of Richmond. Under the supervision of the U. S. Engineers improvements are being made to obtain a depth of 22 feet in the channel from the entrance to Richmond. At its mouth the river is about 3 miles wide; above this its width is irregular until up to City Point; from thence to Richmond its width ranges from 200 to 650 yards. The towns and landings on the river and its tributaries have a large trade in tobacco, granite, iron, lumber, and wood, carried in coasting vessels, and flour, shipped principally to ports in South America. Several lines of coasting steamers make regular trips to Richmond, and bay steamers touch at the landings on the river.

Numerous creeks and several rivers empty into the James below Richmond; only three of these are of any commercial importance, or navigable by vessels of over 8 feet draught.

Pagan Creek empties into the James River from the southwestward, about 7 miles above Newport News. The entrance between **Goodwin Point**, on the east, and **Day's Point**, on the west, is about 1¼ miles wide, but the channel is narrow, crooked, and obstructed by bars, which necessitate the services of a pilot for entering the first time. The bars have been somewhat improved by dredging, under the supervision of the U. S. Engineers, so that vessels of 9 feet draught can be taken to the town of Smithfield at high water. **Smithfield**, on the south bank of the creek, about 4½ miles above its mouth, has some trade in cord-wood and lumber, carried in coasting vessels; a steamer of the Old Dominion Line makes regular trips from Norfolk to Smithfield. Strangers desiring to enter Pagan Creek should anchor about ½ mile south of White Shoal Light-house and signal for a pilot. **Jones Creek**, a crooked narrow stream of no importance, empties into the entrance of Pagan Creek from the eastward. The bar at its mouth has about 2½ feet of water upon it.

Warwick River empties into the James River about 8 miles above Newport News; the entrance is **N. ½ W.** from White Shoal Light-house. This river is of no commercial importance; a shoal extends across its entrance through which a narrow channel, with 7 feet of water, leads about 1½ miles into the river; above this is a bar with 4 feet of water. Oystermen anchor on the shoals at the river entrance, but strangers should not.

Lawn's Creek is a narrow unimportant stream, emptying into the west side of the river, just below Deep Water Shoal Light-house and about 16 miles above Newport News. There is a bar at the mouth of the creek with about 3 feet of water upon it.

Skiff Creek is shallow and unimportant. The entrance is northeast from Deep Water Shoals Light-house, and obstructed by a bar with 2 feet of water upon it.

College Creek, 22 miles above Newport News, on the opposite side of the river from Hog Point, has a bar at its mouth with 2 to 5 feet of water over it. There is 6 to 11 feet of water in the channel of the creek inside the bar.

Cobham Creek is a narrow unimportant stream, emptying into **Cobham Bay**, the large bight opposite Jamestown Island.

† Shown on Coast and Geodetic Survey charts: **401a, 401b, 401c**, scale of each $\frac{1}{40,000}$, price of each $0.40; **401d, 401e**, scale of each $\frac{1}{20,000}$, price of each $0.30. These 5 charts form one series from the mouth of the river to Richmond. Also on chart **376**, scale $\frac{1}{400,000}$, price $0.50.

Gray's Creek is a narrow stream of little importance, emptying into the James River from the southwestward, opposite the upper end of Jamestown Island. There is about 3½ feet of water on the bar at the mouth of the creek.

Powhatan Creek, at the upper end of Jamestown Island, can only be navigated by small boats.

Chickahominy River is an important tributary of the James River, emptying into the latter from the northward about 33 miles above Newport News. The river is navigable for barges, about 39 miles, to **Forge Bridges**, and for vessels of 8 feet draught to **Windsor Shades**, about 30 miles above its mouth; 12 feet can be taken up to **Binns Bar**, 20 miles above the entrance. The saw-mills and landings ship large quantities of lumber, wood, and railroad ties in vessels of 6½ to 13 feet draught. Small steamers make landings on the river. Timber is brought down in rafts from the upper part of the river and its tributaries. The channel is narrow and crooked; it has been improved, under the supervision of the U. S. Engineers, by dredging channels through the bars up to Windsor Shades. The bar at the mouth of the river has a channel 200 feet wide and 14 feet deep, at Binn's Bar 160 feet wide and 8 feet deep, at Old Fort 75 feet wide and 8 feet deep, and at Windsor Shades 100 feet wide and 8 feet deep. The dredged channel at the mouth of the river is marked by two buoys; these are the only aids to navigation in the river. Strangers entering should take a pilot or tow-boat at Newport News or in the James River. The mean rise and fall of tides at the mouth of the river is about 2 feet. The numerous creeks emptying into Chickahominy River are of no special importance except as water-ways for rafts and barges.

Chippoak Creek empties into the James River from the southwestward, just above the village of **Claremont**, 38 miles above Newport News. The entrance of this creek is obstructed by a bar with about 3 feet of water upon it.

Kittewan Creek, emptying into the James River from the westward, about 6 miles above Claremont, is narrow and has about 1½ feet of water on the bar at its entrance.

Ward's Creek is a narrow stream, with 1 foot of water on the bar at its entrance, emptying into James River from the southward, about 2½ miles above Kittewan Creek.

Court-House Creek is a shallow stream, of no importance, opposite Windmill Point, and about 50 miles above Newport News.

Herring Creek is a narrow unimportant stream emptying into the James River from the northwestward, about 2 miles above Windmill Point.

Powell's Creek is about 1½ miles above Herring Creek, on the opposite side of the river. The bar at the entrance of this creek has only 3 feet of water upon it.

Appomattox River empties into James River from the southwestward, between City Point and Bermuda Hundred, and about 60 miles above Newport News. The channel is narrow and crooked; it has been improved, under the supervision of the U. S. Engineers, by dredging and the construction of dikes and training-walls. In 1888 a draught of 10 to 10½ feet could be taken at full tides to Petersburg, 11 miles above the mouth of the river. The city of **Petersburg**, at the head of navigation, has considerable trade carried principally in vessels of less than 10 feet draught. It is connected with City Point by railroad; cotton and tobacco are sent to City Point from Petersburg to be shipped in the heavy-draught vessels which cannot enter the river.

The channel of Appomattox River is buoyed, but a stranger should not enter without a pilot or tow-boat; either may be obtained at City Point. The mean rise and fall of tides at the mouth of the river is 2.8 feet.

Turkey Creek, emptying into the James River from the northward, about 4 miles above City Point, is shallow and of no importance.

Curles' Creek empties into the James River from the westward, about 1½ miles above Turkey Creek. The bar at the entrance has 2 feet of water upon it.

Four-Mile Creek is of no importance; its entrance is on the north side of the river, about 12 miles above City Point and about 3½ miles below Dutch Gap Canal.

Dutch Gap Canal is a cut about 230 yards long, 300 feet wide, and 18 feet deep; it is 75 miles above Newport News and 12 miles below Richmond. This canal cuts off a long bend of the river and shortens the distance to Richmond by about 4¾ miles; it is marked at both ends, on the port hand going up by a lens lantern (see table of lights, page 16).

Newport News, on the north shore at the entrance of the James River, is described under the heading "Hampton Roads." Pilots and tow-boats for James River and its tributaries can be obtained at Newport News.

City Point is a town on the eastern point of entrance to the Appomattox River, 60 miles above Newport News. It is connected with Petersburg by a railroad, and has considerable trade in tobacco, cotton, flour, and timber, shipped in the largest class of vessels entering the river. Vessels up to 18 feet draught take cargoes from City Point. The larger vessels bound up to Richmond take a tow-boat at City Point if they have not taken one lower down the river.

Bermuda Hundred is a village on the west bank of the James River, nearly 1¾ miles above City Point and just above the mouth of the Appomattox River. Tow-boats sometimes take coal from the landing, and barges come for cargoes of bituminous coal.

The city of **Richmond** (capital of the State of Virginia) is at the head of navigation, on the north bank of the James River, 87 miles above its mouth. It has a large coastwise and some foreign trade; the heaviest draught vessels entering and clearing from the port is 16 feet. The larger class of sailing-vessels usually tow up the river either from Newport News or from City Point. There is a dock at Richmond in which vessels lie to load and discharge cargoes;

the dimensions of the lock into this dock are: length 180 feet, width 33½ feet, depth 14 feet. The depth of water at the wharves ranges from 12 to 15 feet at low water.

Manchester, a town on the opposite side of the river and connected with Richmond by several bridges, has several large manufactories.

Prominent Features and Aids.—Approaching and entering the river, the large grain elevator at Newport News will be the most prominent object in this vicinity. After entering the river the light-houses (see table, page 16) and the buoys are the best guides.

The **Channel** of James River below City Point is crooked, and at its narrowest part Harrison's Bar is about 100 feet wide in the dredged cut. Strangers should not attempt to sail up the river to City Point unless with a fair wind in the daytime and drawing less than 14 feet. Above City Point the channel is very narrow and crooked in places, and sailing-vessels require the services of a tug. From the mouth of the river to the city of Richmond the narrower parts of the channel and the prominent shoals and dangers are marked by buoys and by several light-houses.

Anchorages.—The mouth of the river off Newport News affords excellent anchorage for vessels of the largest class and draught; it is also a favorite anchorage for coasters entering Hampton Roads for shelter. Vessels bound up or down the river anchor anywhere in the channel where the depth of water and the character of the bottom are favorable. Off the city of Richmond vessels are permitted to anchor in the stream, but not for a longer time than 24 hours without permission from the Harbor Master.

The **Harbor Master** at Richmond attends to the mooring and berthing of vessels, at the request of persons in charge, and keeps the channel of the river clear for the passage of vessels. The Dock Master of the Richmond Dock attends to the berthing of vessels while in the dock.

Pilots.—Pilotage in James River is not compulsory; vessels desiring a pilot for the river can get one at Hampton Roads or Newport News. For Virginia Pilot Laws, see Appendix I.

Tow-boats.—Sailing-vessels bound to Richmond or City Point generally take a tow-boat at Hampton Roads. Those of less than 14 feet draught can sail up to City Point, with a favorable wind, by closely following the directions, but they should take a tow-boat if bound farther up. The captains of tugs are licensed pilots.

Supplies.—Coal for steamers (bituminous) can be obtained at Newport News, Bermuda Hundred, and Richmond. Provisions can be had at City Point, Richmond, and many of the landings along the river. Ship-chandlers' stores can be obtained at Richmond.

Repairs.—Machinery of steamers can be repaired at Richmond. The nearest dry-dock is at Newport News (see "Repairs" under heading "Hampton Roads").

Freshets occur irregularly in the fall, winter, and spring; the range of their height at Richmond is from 5½ to 28½ feet, but this latter is exceptional. Vessels are not endangered by the freshets. A freshet of 25.1 feet at Richmond was 14.5 feet at Dutch Gap, 2.2 feet at City Point, and hardly felt at Brandon.

Ice.—There is some drift-ice in the river during severe winters, and at times the river is frozen solid for a few miles below Richmond. Navigation to Richmond is hardly ever suspended 30 days at one time on account of ice.

Currents.—The currents follow the general direction of the channel except between Hog Island and Jamestown Island, when they set across Goose Hill Flats. Their velocity is variable; in the lower reaches the flood current approximately equals the ebb in velocity; in dry seasons the velocity of the flood increases. The main counteracting effect of the flood is the freshet current.

Tides.—The force and direction of the wind have a marked influence on the time of high water and the rise and fall of the tides. The variation of the tides in the river are very intricate. There may be a difference of 2 feet in the height of high water at City Point and Richmond, or the same difference in the low water of the same tides. The following table shows the relative time of high water at different points on the river, after high water at Fortress Monroe, and the mean rise and fall of tides:

TIDES.—JAMES RIVER.

GENERAL TABLE.

The corrected establishment for Old Point Comfort is $8^h\ 46^m$.

Locality.	Time of high water after time of high water at Old Point Comfort.		Mean Rise and Fall.			Mean Duration of—			Rise of highest tide observed.	Approx. dist. of station above Newport News.
			Mean tides.	Spring tides.	Neap tides.	Rise.	Fall.	Stand.		
	h.	m.	feet.	feet.	feet.	h. m.	h. m.	h. m.	feet.	miles.
Warwick River	0	49	2.6	3.0	2.2	6 02	6 23	0 31	3.5	8
Hog Island	2	07	2.1	2.5	1.7	5 55	6 30	32	3.3	22
Claremont	3	54	2.0	2.3	1.7	5 43	6 42	33	4.5	38
City Point	5	50	2.8	3.3	2.3	5 27	6 58	32	3.8	60
Curls' Neck	6	49	3.2	3.8	2.6	5 18	7 07	32	4.4	69½
Dutch Gap	7	14	3.5	4.1	2.9	5 15	7 10	34	4.5	75
Falling Creek	7	42	3.8	4.5	3.1	5 10	7 15	33	4.5	81½
Richmond Bar	7	52	4.0	4.7	3.3	5 05	7 20	35	4.7	84
Richmond	8	09	3.6	4.2	3.0	5 00	7 25	35	4.7	87

SAILING DIRECTIONS, JAMES RIVER.

These directions, if closely followed, are good for vessels of 14 feet or less draught. Vessels of a greater draught should employ a tow-boat or a pilot, as some local knowledge is necessary to keep in the best water in the narrower parts of the channel. Directions for entering Chesapeake Bay will be found on pages 25–27, and for entering Hampton Roads to Newport News on pages 33–35.

Note.—In following these directions special attention should be paid to the buoys and the distance they are to be left when passing.

1. ***From Newport News to Point of Shoals Light-house.***—Passing Newport News, steer **NW.** and leave the wharves about ¼ mile on the starboard hand. When the grain elevator at Newport News bears **SE.** by **E.**, steer **NW.** by **W.**, keeping the bearing. On this course black can-buoy (No. 3) will be left about 500 yards on the port beam; White Shoal Light-house, about 450 yards on the starboard hand; and black spar-buoy (No. 5), off Day's Point, about 350 yards on the port beam. Continue the **NW.** by **W.** course about 1¼ miles after the latter buoy bears abeam, and then change the course to **W.** ½ **N.**; black can-buoy (No. 7) should be left 350 yards on the port hand, and red spar-buoy (No. 2) about 600 yards on the starboard hand. Now follow the southern shore of the river, giving it a berth of ½ to ¾ mile, and leave Point of Shoals Light-house 300 to 500 yards on the starboard hand. Then follow the directions under Section 2.

Remarks.—When passing the wharves at Newport News, care should be taken to avoid the wreck of the Florida, which lies 150 yards from the ends of the wharves and **W.** ⅞ **S.** from the elevator. The wreck is marked by a red and black horizontal-striped buoy. Standing up the river, White Shoal Light-house will show prominently. **Day's Point**, on the southern shore of the river, is the most prominent landmark, showing a steep bluff at the end, which is clearly defined. As the light-house is approached Warwick River will be opened to the northward, but is not very easily distinguished, and Pagan Creek entrance to the southward. White Shoal shows several bare spots to the westward of the light-house. After passing White Shoal Light-house, Point of Shoals Light-house will be seen (see table, page 16) on the port bow, about 6½ miles above White Shoal Light-house. Fish-stakes make out from the southern and western shore of Burwell's Bay nearly to the edge of the channel, and a long wood-wharf and railway shows prominently to the westward of Point of Shoals Light.

Dangers and Aids.—**Naseway Shoal** (left on the port hand on the **NW.** and **NW.** by **W.** courses) is an extensive shoal extending about 3½ miles to the eastward and about 1⅝ miles to the northward of Fishing Point, the southern point of entrance to the James River. This shoal has from 1 to 10 feet of water over it, and in some places bare spots show at low water. On the edge of the shoal, and about ⅞ mile **SW.** by **W.** from the elevator at Newport News, is Naseway Shoal lower buoy (spar, black, No. 1). Naseway Shoal upper buoy (can, black, No. 3) is on the northern edge of the shoal, 1⅝ miles **N.** from Fishing Point and 3 miles **NW.** by **W.** ½ **W.** from the elevator at Newport News. There are several spots bare at low water just to the southward of this buoy.

Brown's Shoal (left on the starboard hand on the **NW.** by **W.** course), showing bare at low water, is one of the numerous shoal spots lying off the northern shore between Newport News and Warwick River Entrance; just to the eastward of Warwick River some of the shoals extend out 1½ miles from the shore.

White Shoal (left on the starboard hand on the **NW.** by **W.** course) lies in the middle of the river, about 5½ miles above Newport News. This shoal is about 1¼ miles long in a **SE.** and **NW.** direction between the 12-foot curve, about ⅜ mile wide, and shows several bare spots at low water. Near its southeastern end it is marked by White Shoal Light-house (see table, page 16).

The wreck of a schooner, marked by a red and black horizontal-striped spar-buoy, lies ¾ mile **S SW.** from White Shoal Light-house. The sailing-line passes well to the northward of this wreck.

Day's Point Shoal (left on the port hand on the **NW.** by **W.** course) is a large shoal extending across the entrance of Pagan Creek, and about ¾ mile to the northeastward from Day's Point, the western point of entrance to Pagan Creek. This shoal has several spots showing bare at low water, and is marked by a buoy (spar, black, No. 5) placed off its northern edge, about **NE.** ½ **E.** from Day's Point. There is a narrow channel with 6½ feet of water leading into Pagan Creek.

Glover's Bluff Shoal (left on the port hand on the **W.** ½ **N.** course) is part of the extensive shoals which extend out ½ mile from the southwestern shore above Day's Point. About ½ mile from the shore and nearly 2 miles to the westward of Day's Point the edge of this shoal is marked by a buoy (can, black, No. 7).

Point of Shoals (left on the starboard hand) is a large shoal, showing bare spots at low water, lying in the middle of the river above Warwick River and Pagan Creek entrances. This shoal extends in a broken line from **Point of Shoals Light-house** (see table, page 16), which marks its upper (southwestern) end, to the entrance of Warwick River. Brown's Shoal buoy (spar, red, No. 2), about 1⅝ miles **SE.** from the light-house, marks the edge of this shoal. Shoal spots also extend from the light-house in a northeasterly direction to Mulberry Point.

Shoals make out nearly ½ mile from the shore of Burwell's Bay; they rise abruptly from the channel, have from 1 to 5 feet of water over them, and are covered with fish-stakes nearly to the edge of the channel.

2. ***From Point of Shoals Light-house to Jamestown Island.***—When Point of Shoals Light-house bears **E.**, distant 300 to 500 yards, steer **N.** by **E.** ¾ **E.** until up to Hardin's Bluff Shoal buoy (spar, black, No. 9); when this buoy is about 400 yards off the port beam, steer

N. ½ E., keeping Deep Water Shoals Light-house a little on the starboard bow, and leaving Lawn's Creek Flats lower buoy (spar, black, No. 11) on the port hand. Pass about 400 yards to the westward of Deep Water Shoals Light-house, and when it bears S SE. steer N NW., keeping it on the bearing astern. Lawn's Creek Flats upper buoy (spar, black, No. 13) will be left on the port hand and Hog Island Flats buoy (spar, black, No. 15), marking the northern channel, will be left about ½ mile on the starboard hand. Turning Point buoy (nun, red, No. 2) will be made nearly ahead; leave it about 100 yards on the starboard hand and steer NW. ½ W. for Upper Entrance buoy (spar, red, No. 4). When up to this buoy, leave it about 75 yards on the starboard hand and haul a little to the westward so as to leave Hog Island Point Shoal buoy (can, black, No. 19) about 100 yards on the port hand.

From black can-buoy No. 19 steer about SW. by W. ¼ W., leaving Goose Hill Middle Ground buoys (spar, black, Nos. 21 and 23) on the port hand and Entrance to Cut buoy (spar, red, No. 4½) on the starboard hand. Having passed the latter buoy, steer a little more to the westward and pass a little to the southward of Lower Point Shoal buoy (nun, red, No. 6); then follow the directions under Section 3, following.

Note.—The Main Channel above Deep Water Shoals Light-house may be followed by close attention to the buoys, and although wider than the Swash (South) Channel, it is about 2 miles longer.

Remarks.—Standing up the river after passing Point of Shoals Light-house, **Deep Water Shoals Light-house** (see table, page 16) will be made on the port bow. Shoals lie in the middle of the river above Deep Water Shoals Light-house, with a channel on each side—the **Main Channel** (the northern) and the **Hog Island Swash Channel** (the southern); these channels are each marked by buoys and unite at Hog Point, about 4 miles above Deep Water Shoals Light-house. **Hog Point** is low, bare, and flat, backed by trees; there is a small village which shows from the eastward; a long wharf makes out which, when seen from down the river, appears as the end of the point. The shores to the northward of Hog Point, at intervals, show bare bluff faces about 15 to 20 feet high. **The Main Channel** has 2 feet more water and is a little wider than the Swash Channel, but the latter is 2 miles shorter. The directions are for the **Swash Channel**, which has 17 feet of water. After rounding Hog Point, **Jamestown Island**—low, with scattered clumps of trees—will be made on the starboard bow just above the entrance to **The Thoroughfare**; the latter separates Jamestown Island from the mainland. **Cobham Bay** is the large bight to the southward of Jamestown Island; it is full of shoals.

Dangers and Aids.—**Hardin's Bluff Shoal** is part of the shoals making out from the western shore above Burwell's Bay. A buoy (spar, black, No. 9) is placed on the edge of the shoal, nearly 2 miles above Point of Shoals Light-house; this buoy is left on the port hand going up river.

Lawn's Creek Flats make out from the western shore, opposite Deep Water Shoals Light-house. These flats have spots with 3 feet of water over them, and are marked by two buoys which are left on the port hand when standing up the river. The lower buoy (spar, black, No. 11) is about ¼ mile SW. by W. from Deep Water Shoals Light-house, and the upper buoy (spar, black, No. 13) about ½ mile NW. by N. from the light-house. The channel leads between the buoys and the light-house.

Deep Water Shoals make out from the eastern shore above Mulberry Point. These shoals rise abruptly from the channel, have 2 to 6 feet of water over them, and are marked at their western edge by **Deep Water Shoals Light-house** (see table, page 16).

Hog Island Flats (left on the port hand going up the Main Channel and on the starboard hand going up the Swash Channel) lie in the middle of the river and have from 4½ to 11 feet of water over them. These flats are marked by 4 buoys: Southeast buoy (spar, black, No. 15) is 1¼ miles N. of Deep Water Shoal Light-house; Northwest buoy (spar, black, No. 17) is 1 mile NE. by E. from Hog Point; these two buoys are colored and numbered for the Main Channel. Turning Point buoy (nun, red, No. 2) is on the southern edge of the flats, about 2¾ miles N NW. from Deep Water Shoals Light-house; Upper Entrance buoy (spar, red, No. 4) is near the western end of the flats, about ⅝ mile N NE. ¼ E. from Hog Point; these two buoys mark the northern side of the Swash Channel.

Tree Hill Shoal lies ⅝ mile off the northern shore, about 3¼ miles above Deep Water Shoals Light-house, and on the north side of the Main Channel. This shoal has 2 feet of water over it, and is marked at its southern edge by a buoy (spar, red, No. 4). A channel with a depth of 11 feet leads about 500 yards off shore to the northward of this shoal.

Hog Island Point Shoal makes out to the northward and about ½ mile to the northwestward of Hog Point. The northwestern point of the shoal is marked by a buoy (can, black, No. 19). Approaching the shore of Hog Island below Hog Point the water shoals gradually from 18 feet to 12 feet, but suddenly from 12 feet to 6 feet.

Goose Hill Flats or Middle Ground lies in the middle of the river, above Hog Point and to the eastward of Jamestown Island. It is about 1⅝ miles long, ⅝ mile wide, has 3 to 9½ feet of water over it, and is marked by two buoys placed on its northwestern edge. The lower buoy (spar, black, No. 21) is 1⅝ miles W SW. ¾ W. from Hog Point, and the upper buoy (spar, black, No. 23) is a little over ¾ mile SW. by W. ¼ W. from the lower. These buoys are left on the port hand going up the river. There is a channel with 13½ feet of water to the eastward of the Middle Ground, but it is not buoyed.

Lower Point Shoal makes out from the southeastern point of Jamestown Island toward Goose Hill Middle Ground. A cut has been dredged through this shoal, which is marked by two buoys: Entrance to Cut buoy (spar, red, No. 4½) and Lower Point Shoal buoy (nun, red, No. 6); both these buoys are left on the starboard hand going up river.

The shoals in Cobham Bay have 4½ to 5½ feet of water over them, and have a number of fish-stakes which extend nearly to the edge of the channel.

3. ***From Jamestown Island to Claremont.***—When Lower Point buoy (nun, red, No. 6) is about 400 yards on the starboard quarter, change course to **NW.** so as to pass 400 yards to the southward of Church Point, and leave black can-buoy No. 25 about 150 yards on the port hand. When past black can-buoy No. 25 steer **W NW.**, leaving Back River buoy (spar, red, No. 8) about 250 yards on the starboard hand. When black can-buoy No. 27 is about 100 yards distant on the port beam, steer about **W.** ½ **S.** for 2⅜ miles; the remains of Dillard's Wharf will then be about 500 yards on the port beam; then steer about **W.** ¼ **N.** so as to pass about 400 yards to the southward of red nun-buoy No. 10. When up to the latter, steer about **NW.** by **W.**, keeping in the middle of the river until past Claremont Wharf, then follow the directions under Section 4.

Remarks.—**Church Point**, the southwestern point of Jamestown Island, when seen from down the river is wooded and abrupt, with a remarkable flat bluff nose extending out from it; **Jamestown Wharf** is about ⅝ mile to the eastward of the point. The broad and shallow entrance to Gray's Creek is opposite Church Point and just below **Swan's Point**, which is low and thickly wooded, with several prominent trees near its end. After passing Church and Swan's points, vessels bound into the Chickahominy River continue the **NW.** course and follow the northern shore to the dredged channel.

About 4½ miles above Church Point, Chickahominy River entrance will be fully opened out. **Barrett's Point**, the eastern point of entrance, makes out low and partly cleared, with a conspicuous group of detached trees on the extremity of the point. On the western side of the entrance to Chickahominy River is a noticeble bare bluff with abrupt bare faces. The shoals off the entrance are usually covered with fishing-stakes.

Claremont Landing, at Sloop Point, on the south shore, has four wharves; the upper one has a large railroad shed upon it. **Claremont Wharf** is the long wharf about 1¼ miles above the railroad wharf and 2½ miles above Dancing Point, the western point of entrance to Chickahominy River. The village of **Claremont** is on high land and hidden by trees; a few houses will show among the trees when up to the landing.

Dangers and Aids.—**Swan's Point Shoal** makes out ½ mile to the northeastward from Swan's Point. It has 2 to 8 feet of water and is marked at its northeastern point by a buoy (can, black, No. 25). **Shoals** extend off the mouth of Gray's Creek and the south shore between Swan's Point and Cobham Bay. Back River buoy (spar, red, No. 8) is about ⅞ mile above Swan's Point Shoal buoy; vessels bound up the James River leave it on the starboard hand, and those bound into the Chickahominy River leave it on the port hand.

Brown's Shoal (left on the port hand going up river) makes out from the south shore above Swan's Point; the edge of this shoal is marked by a buoy (can, black, No. 27) lying **NW.** ½ **W.**, distant 1⅜ miles from Swan's Point.

Dancing Point Flats are extensive shoals making out to the eastward and southeastward from Dancing Point; they have from 3 to 11 feet of water over them, and extend across and well off from the entrance to Chickahominy River. The southern edge of these flats, about ⅞ mile from Dancing Point, is marked by a buoy (nun, red, No. 10). Vessels bound up the river leave the flats on the starboard hand.

Between Dancing Point and Claremont Wharf the channel takes nearly the full width of the river. The water shoals abruptly on approaching the shores.

4. ***From Claremont to Windmill Point.***—Continue the **NW.** by **W.** course, leaving Claremont Wharf about 500 yards on the port hand, and when off the middle of the entrance to Chippoak Creek steer a little more to the northward, favoring the western shore above the entrance to the creek until up to Brandon Point. Above Brandon Point follow the eastern shore, and when up to where the river makes a turn to the westward follow a mid-channel course, keeping out of the bights. After passing the entrance to Kittewan Creek (about 6 miles above Claremont) and when about 1 mile below Weynoak Point, favor the eastern shore slightly, keeping out of the bight at the mouth of Ward's Creek.

Round Weynoak Point, keeping in mid-stream, and when about ⅜ mile above **Flowerdew Hundred Creek**—the small creek just above Fort Powhatan—steer about **N.** by **E.** so as to pass to the eastward of Minzie's Middle Ground lower buoy (spar, red and black horizontal stripes). When ⅜ mile past this buoy haul gradually to the westward, leaving Minzie's Middle Ground upper buoy on the port hand and passing about midway between Windmill Point and the shore to the northward of the point.

Remarks.—Standing up the river from Claremont Wharf, **Tree's Point**, on the eastern shore, about 2¼ miles above Claremont, is wooded to the water's edge and shows quite prominently; above the point are the ruins of a landing. **Brandon Point**, opposite Tree's Point, has the remains of an old landing. **Sturgeon's Point**, about 2¼ miles above Tree's Point, has a small landing and a brickyard backed by a high bare bluff. Kennon's Marsh is the low point on the west shore about 1½ miles above Brandon Point; there are some bushy trees at its end and a few scattered trees on the marsh. **Weynoak Point** is low and wooded, on the north shore about 4 miles above Sturgeon Point. Opposite and a little below Weynoak Point, off the entrance to Ward's Creek, are the remains of a wood pier. **Fort Powhatan**, on the opposite shore from Weynoak Point, above Ward's Creek, is high and thickly wooded; the fort cannot be distinguished from the river. **Windmill Point** is a low point nearly 2¾ miles above Fort Powhatan, where the river makes a sharp turn to the southwestward; there is a thick group of trees on the end of the point. **Wilcox' Wharf and Post Office** are on the north shore of the river, opposite Windmill Point. The land to the eastward of Wilcox' Wharf shows bare bluffs to the entrance of Court House Creek.

Dangers and Aids.—**Shoals** make out for some distance from the northern shore; below Tree's Point they have from 3½ to 15 feet of water over them, and may be avoided by keeping the southern and western shore the best aboard.

The bight above Brandon Point in the west shore is full of shoals, which rise abruptly from the channel.

Kennon's Flats fill the bight in the north shore opposite the northwestern point of Kennon's Marsh. A buoy (spar, red, No. 12) is placed on the edge of the flats. Above Kennon's Flats buoy the bights are all shallow, and the water shoals suddenly on both sides of the channel.

Just below Weynoak Point a shoal, with from 1 to 13 feet of water over it, makes out about ½ mile in an easterly direction from the western shore. This shoal is not marked, but is avoided by favoring the eastern shore, taking care not to get into the bight off the mouth of Ward's Creek.

Above Fort Powhatan shoal water extends only a short distance from the shores until up to Minzie's Middle Ground, but the shoaling is very abrupt.

Minzie's Middle Ground lies in the middle of the river to the eastward of Windmill Point; it has 2½ to 9 feet of water over it, and is nearly ⅞ mile long in a **N NW.** and **S SE.** direction. At its southeastern end is a buoy (spar, red and black horizontal stripes) and at its northwestern end is another red and black horizontal-striped buoy. The channel passes to the eastward of the Middle Ground, but there is a channel (Swash Channel) with 13 feet water between the Middle Ground and Windmill Point.

5. ***From Windmill Point to City Point.***—When midway between Windmill Point and the shore to the northward, steer to the southwestward so as to leave black spar-buoy No. 29 close-to on the port hand, and from this buoy shape the course about **SW.** by **W.** ¾ **W.**, keeping in the middle of the river until red spar-buoy No. 14 is well on the starboard bow; then steer more to the westward so as to leave it about 200 yards on the starboard beam; then steer about **W.** by **N.** for black spar-buoy No. 31. Leave black spar-buoy No. 31 on the port hand and follow the buoys, leaving the black buoys on the port hand and the red ones on the starboard hand.

Caution.—The channel at **Harrison's Bar**, 1⅝ miles above black spar-buoy No. 31, is very narrow, and the buoys should be closely followed. Black spar-buoys Nos. 35, 37, 39, 43, and 45 have bushes attached, which give them the appearance of nun-buoys when seen from a distance.

Remarks.—**Buckler's Point**, on the north shore, about 1⅝ miles above Wilcox Wharf, is moderately high and wooded to the water's edge. After passing this point **Jordan's Point Light-house**, about 2¼ miles below City Point, should be made ahead and on a line with black spar-buoy No. 31. The remains of the wharf at Harrison's Landing will be made on the starboard bow. **City Point** is high and wooded, with an abrupt slope to the river; the settlement is on the northern slope of the hill and does not show well from down the river. The channel above black spar-buoy No. 31 is narrow, but the buoys are so placed as to be readily seen and followed. The water shoals abruptly on both sides.

Dangers and Aids.—**Flowerdew Hundred Middle Ground** is off the western side of Windmill Point; it has 2 to 12 feet of water over it, and is marked at its western edge by a buoy (spar, black, No. 29) which is left on the port hand going up the river.

Buckler's Point Shoal makes off to the southward from Buckler's Point a little over ¼ mile. This shoal has 2½ to 10 feet of water over it, and is marked at its southern edge by a buoy (spar, red, No. 14).

Harrison's Bar is a large shoal, bare at extreme low tides, lying in the middle of the river off Harrison's Landing. This shoal is 2¾ miles long in a general **E SE.** and **W NW.** direction, and its northern edge, along which the channel passes, is marked by five black spar-buoys numbered 31, 33, 35, 37, and 39. A narrow channel, with a least depth of 12½ feet, leads to the southward of this bar, but it is not buoyed, and is seldom used except by those well acquainted with the river.

Harrison's Point Flats make off from the northern shore just above Harrison's Landing. The edge of these flats is marked by two buoys. The lower buoy (nun, red, No. 16) is placed where the channel between the flats and Harrison's Bar is very narrow and has been improved by dredging. The upper buoy (spar, red, No. 18) is nearly ⅝ mile **NW.** ½ **W.** from the lower buoy.

North Flats and **Eppes Island Flats** are the extensive shoals lying on the north side of the channel above and joining Harrison's Point Flats. The edge of these flats is marked by two red spar-buoys, Nos. 20 and 22, and by two red nun-buoys, Nos. 24 and 26.

Bailey's Creek Flats is the extensive shoal which fills the bight in the south shore between Jordan's Point and City Point. The edge of the flats is marked by one black can-buoy, No. 41, and three black spar-buoys, Nos. 43, 45, and 47. These buoys are left on the port hand going up the river.

Eppes Island Shoal is the name given to the part of Eppes Island Flats lying to the southwestward and westward of Eppes Island. The edge of this part of the shoal is marked by red spar-buoy No. 28 and red nun-buoy No. 30.

The entrance of Appomattox River, just above City Point, is full of shoals. The channel leading into Appomattox River is marked by buoys which must be left on the port hand when standing up the James River above City Point.

Sailing directions of value cannot be given for James River above City Point.

BACK RIVER†

makes into the western shore of Chesapeake Bay, about 6 miles to the northward of Old Point Comfort. The river is shallow, with a narrow and crooked channel, which leads between bars making out from the entrance and others lying in the middle of the river. At its head the river is divided into two branches, the **Northwest Branch** making in to the northwestward for a distance of 2½ miles, and the **Southwest Branch** making in to the southwestward 3 miles. Back River has some trade in fish-oil, guano, oysters, wood, and farm produce, carried principally in small vessels trading in the bay. It is stated that the deepest draught entering the river is 14 feet, and 7 to 8 feet can be carried into the branches at high water. **Back River Light-house** marks the south side of the entrance to the river (see table, page 16).

The channel over the bar at the entrance is buoyed and has a depth of 10 feet at low water in its shoalest part. The entrance to this channel is 5 miles **N. ½ W.** from Thimble Shoal Light-house and 6¾ miles **S. ¼ W.** from York Spit Light-house. Inside the mouth of the river there are no aids. A small settlement with a fish factory and two wharves is inside the southern point of entrance on **Northendean (North End) Point.** Strangers entering the river always take a pilot. One can be had by making signal when off the entrance. If the wind is from the eastward, it is advisable to lie off and on; if the wind is westerly, vessels can anchor in 3 fathoms of water off the entrance and wait for a pilot.

Tow-boats are seldom used; they may be had at Hampton Roads, or the small steamer belonging to the fish factory may be employed to tow vessels into the river.

Tides and Tidal Currents.—The mean rise and fall of tides at the mouth of the river is about 2½ feet. The tidal currents are baffling. Local knowledge is necessary for the safe navigation of the river.

SAILING DIRECTIONS, BACK RIVER.

The following directions will carry a vessel to the entrance of the channel over the bar; above this a stranger must be guided by the buoys or take a pilot.

1. ***Approaching from the Southward.***—I. ***From a position 1¼ miles S. of the bell-buoy on southeastern end of Middle Ground.***—Make good a **NW.** by **W. ½ W.** course for 14 miles, and anchor with Back River Light-house bearing **W.** by **S.**, distant 1¼ to 1½ miles.

II. ***From near Cape Henry.***—Bring Cape Henry Light-house to bear **SE.** and steer **NW.** Anchor with Back River Light-house bearing **W.** by **S.**, distant 1¼ to 1½ miles.

III. ***From Hampton Roads.***—Pass out of Hampton Roads, keeping in the main channel, and when about ¾ mile to the eastward of Thimble Shoal Light-house steer **N.** by **E. ¼ E.** about 4¼ miles, haul to the westward and anchor as directed in preceding paragraph.

Note.—These courses are good for a draught of 14 feet or less. When approaching Back River Light-house on the **NW.** by **W. ½ W.** course, the least depth found will be 3½ fathoms.

Remarks.—All the courses in this Section lead to a point about 1½ miles to the eastward of Back River Light-house. Strangers should here take a pilot if over 7 feet draught, or anchor until one comes on board in answer to signal. Vessels of 7 feet draught may stand in to North End (Northendean) Point by following the buoys. To make the entrance buoy (can, black, No. 1) bring the large square white house on North End Point to bear **NW.** by **W.**, and stand in for it.

Dangers.—**Point of Breakers Shoal** makes out nearly 2½ miles from the shore south of Back River Light-house. It has from 6 to 9 feet of water over it, and can be avoided by keeping Thimble Shoal Light-house bearing to the westward of **S.** by **W.** until Back River Light-house bears to the westward of **NW.** by **W.** There are spots with 13 and 14 feet of water lying 2½ miles **E SE. ½ E.** from Back River Light-house.

Plum Tree Bar makes out 2½ miles in a southeasterly direction from the northern point of entrance to the river, and extends across its mouth. The buoyed channel leads across the southeastern end of this bar and along between it and Point of Breakers Shoal.

1 A. ***Approaching from the Northward.***—Standing down the bay, leave York Spit Light-house 1 mile on the starboard hand and steer **S.** When Back River Light-house bears **W.** by **S.**, steer for it on this bearing, and anchor when it is 1½ miles distant, in 3¼ fathoms water.

See "**Remarks**" and "**Dangers**" under Section 1, foregoing. To avoid the shoals north of the entrance, keep York Spit Light-house bearing to the westward of **N. ¼ W.**

POQUOSIN RIVER†

makes into the western shore of Chesapeake Bay, west of York Spit Light-house and south of York River entrance. The river has several tributaries which flow through a well-cultivated farming country, from which ship-timber and considerable wood and garden produce are shipped to other points on Chesapeake Bay; it also has a large oyster

†Shown on Coast and Geodetic Survey chart: 121, scale $\frac{1}{80,000}$, price $0.50.

trade. A steamer from Norfolk stops regularly at landings on the river. Shoals make out from both shores off the entrance, between which is a good anchorage in 15 to 18 feet of water; but a stranger should not enter the river without a pilot, who may be had by making signal at the anchorage. The usual draught of vessels entering the river is 8 feet or less, but vessels drawing as much as 15 feet have loaded timber. The guides for the anchorage off the mouth of the river are the same as for York River, and in making this anchorage the directions for entering York River should be followed until midway between York Spit Light-house and Too's Marshes Light-house.

The mean rise and fall of tides at the mouth of the river is about 2½ feet.

GENERAL DIRECTIONS, POQUOSIN RIVER.

To an anchorage in the mouth of Poquosin River.—Having followed the directions, Sections 1 or 1 A, "Sailing Directions, York River," bring New Point Comfort Light-house to bear **NE. ¾ N.**, and steer **SW. ¾ S.**, heading fair for the entrance of the river and passing between Poquosin Flats and Too's Point Shoal. When the trees on York Point bear **NW.** by **N.**, anchor in the channel in 15 to 17 feet of water.

Remarks.—On the **SW. ¾ S.** course, **Bennet's Creek** will be gradually opened on the port bow, **Robert's Creek** (very small) will be directly ahead, and **York Point** on the starboard bow. From York Point shoals make out a long distance and rise abruptly from the channel; near the end the point is low and not easily distinguished, but back some distance from the end it is well marked by thick tall pines with bare trunks.

When up to York Point, **Cheseman's Creek** will be opened to the northwestward and a long wharf, with sheds on the outer end, will be seen bearing about **W SW.** This wharf is on the west shore of Poquosin River, opposite **Hunt's Point.**

Dangers.—**Drum Island Flats** and **Poquosin Flats** extend to the eastward and northeastward from the western shore of Chesapeake Bay, between Back and Poquosin rivers, for a distance of nearly 3 miles. These flats have from 2 to 12 feet of water over them and should not be approached from the eastward in less than 18 feet of water, as the shoaling is abrupt inside this depth. Poquosin Flats are the northernmost, and their eastern end extends to within 1⅝ miles of York Spit, this being the width of the channel between them. The northeastern point of Poquosin Flats is marked by a buoy (can, black, No. 1).

York Spit and Too's Point Shoal are described under Section 1, "Sailing Directions, York River."

Shoals make off from the points of entrance to the river; the ends of these shoals are usually marked by bushes or stakes; these are, however, unreliable guides for a stranger, as there are also numerous fish-stakes on the shoals.

YORK RIVER.†

This river, formed by the union of the Pamunkey and Mattapony rivers, flows in a southeasterly direction for about 30 miles, and empties into Chesapeake Bay on the western shore, between Poquosin River and Mobjack Bay, the entrance being about 15 miles north of Old Point Comfort. It is remarkable for its straight course and depth of water in the channel, and is of considerable commercial importance,—large quantities of cotton and tobacco being shipped in foreign and coasting vessels from West Point, and grain, lumber, farm produce and oysters in coasting and bay vessels from landings on the river and its tributaries. Two bars below West Point have been improved by dredging, under the supervision of the U. S. Engineers, and work is in progress deepening and widening the cuts; in 1888 the least depth was 17.8 feet at low water, and the least width 100 feet. Vessels of 22 feet draught are taken up to West Point at high water.

The numerous small creeks emptying into York River between its mouth and West Point (at its head) are comparatively shallow, and only frequented by small vessels carrying oysters or garden produce.

Mattapony River, extending in a northwesterly direction from West Point, is navigable for small vessels up to **Aylett's**, about 43 miles above its mouth, and for barges about 21 miles farther. The river has some trade in grain, cord-wood, lumber and farm produce, carried principally in vessels owned elsewhere. The principal landings on the river below Aylett's are: **Walkertown, Frozier Ferry** and **Mantua Ferry.** Vessels of 10 to 12 feet draught enter the river, but 5 feet is about the deepest draught that can be taken to Aylett's under favorable conditions. A small steamer plies between West Point and the different landings on the river.

The channel is narrow and in some places obstructed by snags and bars; the former are being removed and the latter improved by dredging, under the supervision of the U. S. Engineers, by which it is intended to obtain a channel 40 feet wide with a least depth of 5½ feet up to Aylett's, and 100 feet wide and 7 feet deep across two of the lower bars. Freshets occur in the river in March and April. The tides in the river are greatly influenced by the wind; an easterly wind brings a full tide. The mean rise and fall of tides is about 3 feet at the entrance.

Pamunkey River, extending in a westerly direction from West Point, is navigable to **Hanovertown**, a landing about 67 miles above West Point. Four to 6 feet can be taken up the river 59 miles to **Newcastle Ferry**, 7 to 8 feet 55 miles to **Bassett's Bar**, and 10 to 15 feet 25 miles to **White House R. R. Bridge**, according to the stage of the tide. Vessels may tow up the river or sail up to White House, and then drop up with the tide. There is considerable trade on the river in grain, cord-wood, lumber and farm produce, the carrying being done mostly by vessels owned elsewhere.

† Shown on Coast and Geodetic Survey charts: **398, 399**, scale of each $\frac{1}{60,000}$, price of each $0.20; **376**, scale $\frac{1}{400,000}$, price $0.50. The entrance is also shown on chart **131**, scale $\frac{1}{80,000}$, price $0.50.

Under the supervision of the U. S. Engineers, the river channel, which is narrow, crooked and obstructed by snags and bars, is being improved. The tides are influenced by the winds; their mean rise is about 3 feet at the entrance. Freshets occur in March and April, and at Hanovertown the river sometimes rises 22 feet above low water.

Yorktown is a town of little commercial importance on the south shore of the river, about 6 miles above Too's Marshes Light-house. It has a steamboat landing for steamers running between Baltimore and West Point. Pilots for the river, up to West Point, can be had by making signal below Yorktown; several pilots live on the river-bank near the town.

West Point is at the junction of the Pamunkey and Mattapony rivers, about 30 miles above the mouth of York River. It is a terminus of the Piedmont Air Line Railroad, and has a large foreign and coastwise shipping trade in in cotton and tobacco. The largest draught taken up to the railroad wharves is 22 feet at high water. There are several lines of coasting steamers which call at West Point, all of which have accommodations for passengers. The railroad wharves have excellent facilities for unloading and loading vessels, and large sheds for storage of freight.

Prominent features.—In approaching York River entrance, **York Spit Light-house** and **Too's Marshes Light-house** (see table, page 16) are the most conspicuous objects seen. When well in toward the entrance, **Yorktown Monument**, high white shaft with pyramidal base, will be seen when the entrance is opened. The shores are low and present no conspicuous features, but in the daytime the buoys marking the prominent dangers will be readily distinguished.

Channels.—The channel into the mouth of the river leads to the southward of York Spit, and has a least width of 1⅛ miles and a depth of 5½ fathoms. Between Too's Marshes Light-house and Yorktown the channel favors the southern shore slightly, and has a least width of ¾ mile and depth of 5½ to 11 fathoms. Above Yorktown it gradually narrows, and above Page's Rock there is one place where it is only 200 yards wide. Off the mouth of Potopotank Creek, about 15 miles above Yorktown, a dredged cut (the **Lower Cut**), 105 feet wide and 22 feet deep (in 1888), leads into deeper water above. About 2 miles below West Point is the commencement of the **Upper Cut**, which leads to the wharves at West Point. This cut had a least width of 100 feet and least depth of 17.8 feet (in 1888), and is being widened and deepened. On the north side of the channel, above Page's Rock, the wharves and fish-stakes making out from the shore fairly define the edge of the channel along its narrowest part; the flats south of the channel are marked by oyster-stakes on their shoalest parts, but these are of little use to define the channel except for light-draught vessels. The cuts are well marked by buoys.

Anchorages.—A good anchorage for heavy-draught vessels is just to the eastward or to the westward of Gloucester Point, on the northern edge of the channel. Above Gloucester Point good anchorage is found anywhere in the channel up to Page's Rock, above which the channel is narrow, and heavy-draught vessels should not anchor until off the wharves at West Point. Light-draught vessels can anchor anywhere in the channel except in the cuts.

Pilots.—Vessels required by law to take a pilot (see Appendix I) will get one at the entrance of Chesapeake Bay or in Hampton Roads. Vessels exempt from compulsory pilotage can obtain a pilot at Yorktown. It is advisable for strangers of heavy draught (over 12 feet) to take a pilot if bound above Yorktown. Strangers bound up the Pamunkey or Mattapony rivers should take a pilot or a tow-boat at West Point.

Tow-boats.—The larger class of sailing vessels generally tow up the river; those coming from Baltimore, Hampton Roads or Norfolk for a cargo, generally tow to West Point all the way from those ports. Coasting vessels bound up the Pamunkey or Mattapony rivers generally take a tow-boat at West Point. Tugs can be had at West Point for vessels bound up the York River.

Supplies.—Bituminous coal for steamers can be had at the railroad wharves at West Point. Water can be obtained from a water-boat at Yorktown, or alongside the wharves at West Point. Provisions and ship-chandler's stores, in limited quantities, can be had at Yorktown and West Point.

Repairs.—The nearest large dry-dock is at Newport News. Norfolk and Baltimore are the nearest places where the machinery of steamers can be repaired.

Freshets occur in the Pamunkey and Mattapony rivers in March and April, but they are not dangerous to shipping in York River.

Ice.—The York River is closed by ice for a short time during severe winters; in ordinary winters it is comparatively free from ice.

Currents.—The tidal currents generally follow the direction of the channel except in its narrowest parts, where they have a tendency to set a vessel on shoals. The observed velocity of the currents below West Point was 1½ knots on the ebb and about ¾ knot on the flood. The flood runs 2 hours after high water and the ebb about 2 hours after low water at West Point. In the Mattapony River the flood and ebb currents commence running about 1 hour before they do in the Pamunkey.

Tides.—The mean rise and fall of tides at Too's Marshes Light-house is 2.4 feet; at Moodey's Wharf 3 feet. The force and direction of the wind, however, has a marked influence on the rise and fall of tides. It is high water at Moodey's Wharf about 56 minutes later than at the river entrance.

SAILING DIRECTIONS, YORK RIVER.

1. ***Approaching and Entering.—From the Southward.***—Having followed the directions in Sections 1 and 2, "Sailing Directions, Chesapeake Bay," when up to the Turn of Channel buoy (bell-buoy) shape the course **NW.** ¼ **W.**, and continue on this course a distance of 12 miles until Too's Point Shoal buoy (can, black, No. 3) is ⅜ mile on the port beam. Now steer **W.** ¾ **N.** a little over 2 miles, when Too's Marshes Light-house should bear **S.**, distant about ½ mile, and then follow the directions under Section 2 following.

At night, standing up the bay, when Back River light bears **W.**, or Old Plantation Light shows white, steer for York Spit Light on any bearing between **NW.** ¼ **N.** and **N.** by **W.** When Too's Marshes Light bears **NW.** by **W.** ½ **W.**, steer for it on this bearing until York Spit Light bears **NE.** by **E.** ½ **E.**; then steer **NW.** ¼ **W.** until Too's Marshes Light bears **W.** and Too's Point Shoal buoy (can, black, No. 3) is on the port beam; now steer **W.** ¾ **N.**, a little over 2 miles, until Too's Marshes Light bears **S.**, distant about ½ mile. Come to anchor, and wait for daylight to proceed up the river.

Remarks.—On the **NW.** ¼ **W.** course from the Turn of Channel buoy, York Spit Light-house will be made on the starboard bow; leave it a little over 1 mile on the starboard hand. On a clear day, New Point Comfort and the light-house will be seen to the northward. After passing York Spit Light-house, Poquosin River entrance will be opened out off the port beam, and Too's Marshes Light-house will be made on the port bow. The entrance of York River will be right ahead. As the entrance is approached, Yorktown Monument, on a clear day, will be made broad off the port bow.

Dangers and Aids.—**Drum Island Flats** and **Poquosin Flats** are described on page 48.

York Spit makes out in a general **SE.** direction for a distance of 7 miles from the northern point of entrance to York River and has 1 to 18 feet of water over it. About 1 mile from its southeastern point the spit is marked by **York Spit Light-house** (see table of lights, page 16); 1 mile **SE.** from the light-house the point of the spit is marked by a buoy (can, black, No. 1), and 3¼ miles **NW.** by **W.** ½ **W.** from York Spit Light-house the **Elbow of York Spit** is marked on its southern end by a buoy (nun, red, No. 2). Numerous fish and oyster-stakes are placed on the shoaler parts of the spit

About 2½ miles **E NE.** ¼ **E.** from Too's Point light is the southern entrance to **York Spit Swash Channel**, marked by a buoy (spar, red, No. 8). Vessels of 13 feet draught or less can cross York Spit by passing between ⅓ mile and 2 miles to the westward of the light-house. York Spit Swash Channel is good for 8 feet of water at low water, and is marked by four red spar-buoys, colored and numbered for entering from the northward. This channel is a short cut from the mouth of York River into Mobjack Bay; its northern entrance lies 3 miles **SW.** by **W.** from New Point Comfort Light-house. The channel is on the eastern side of the buoys, which should be passed close-to.

Too's Point Shoal, making out for a distance of 2 miles to the eastward from Too's Point, has from 1 to 17 feet of water over it, and shoals gradually on its eastern side but very abruptly on the northern. About 1¾ miles **E.** by **S.** from Too's Marshes Light-house the northern edge of this shoal is marked by a buoy (can, black, No. 3). Too's Marshes Light-house marks the northwestern part of the shoal. There are many fish and oyster-stakes on this shoal.

A shoal with 3 feet of water over it makes out nearly ⅝ mile to the southward from the point north of Too's Marshes Light-house. The water deepens abruptly to the southward of this shoal.

1 A. ***Approaching and Entering.—From the Northward.***—Standing down Chesapeake Bay, when York Spit Light-house bears to the westward of **SW.**, steer about **S SW.** ½ **W.** so as to pass at least 1 mile to the southeastward of the light-house. Round York Spit Light-house, leaving it from 1 to 1½ miles on the starboard hand, and when it bears **NE.** by **E.** ½ **E.**, distant about 1½ miles, shape a course **NW.** ¼ **W.** until Too's Point Shoal buoy (can, black, No. 3) is ⅜ mile on the port beam, or Too's Marshes Light-house bears **W.** Now steer **W.** ¾ **N.** for 2 miles, until Too's Marshes Light-house bears **S.**, distant ¼ to ½ mile. To continue up the river follow the directions in Section 2.

I. *Or, if drawing less than 13 feet, to cross York Spit.*—When about 2½ miles **E SE.** from New Point Comfort Light-house, shape the course **SW.** ½ **S.**, crossing York Spit about 1¼ miles to the northwestward of York Spit Light-house. When Too's Marshes Light-house bears **NW.** by **W.** ¾ **W.**, shape the course **NW.** ¼ **W.**, and follow the directions for this course in the preceding paragraph.

II. *To pass through York Spit Swash Channel from Mobjack Bay.*—Vessels of 8 feet or less draught can pass through this channel. The North Entrance buoy (spar, red, No. 2) lies 2½ miles **SW.** by **W.** from New Point Comfort Light-house. Steer so as to leave this buoy close-to on the starboard hand and follow the red spar-buoys Nos. 4, 6, and 8, leaving them close-to on the starboard hand. When past red spar-buoy No. 8 (South Entrance buoy), steer about **W.** ¾ **S.**, with Too's Marshes Light-house on the port bow, until the light-house bears **S.**, distant ½ mile.

Remarks.—Passing outside of York Spit at night, Back River light will be made on the port bow. Rounding York Spit Light-house, when New Point Comfort light is in range with York Spit light you will have passed the Spit buoy (can, black, No. 1).

For dangers, see "**Dangers and Aids**" under Section 1, preceding.

2. ***From York River Entrance to Yorktown.***—With Too's Marshes Light-house bearing S., about ½ mile distant, steer **W.** by **S.** until Gloucester Point bears **NW.** ¾ **W.**; then steer about **NW.** by **W.** ½ **W.**, heading fair between Gloucester Point and the town of Yorktown. The reach above Yorktown will be gradually opened out.

Or, follow a mid-river course, giving the south shore a berth of ¾ to 1 mile.

Note.—If desiring to anchor, come-to either to the eastward of Gloucester Point or in mid-channel about 1 mile above the point. The depth in the channel between Yorktown and Gloucester Point is 9½ to 14 fathoms.

Remarks.—On the **W.** by **S.** course the houses of Yorktown and the monument will be made on the starboard bow. **Gloucester Point**, on the north shore of the river opposite Yorktown, will be distinguished by a group of houses and a wharf at its southern extremity. The entrances to two creeks, in the south shore, are passed on this course; they are shallow and of no importance. When changing the course to **NW.** by **W.** ½ **W.**, **Wormley's Creek**, of no importance, will be on the port beam, and **Sarah's Creek** will be opposite on the north shore, to the northeastward of Gloucester Point. **Yorktown Monument** will show above the trees while standing up the river; it stands on a bluff to the southeastward of the town. Between Yorktown and Gloucester Point the channel occupies the full width of the river. There are no aids except Too's Marshes Light-house. A vessel may keep in mid-channel nearly up to Yorktown by bringing this light directly astern, bearing **E.**, and keeping it on that bearing.

Dangers.—From the northern shore for nearly 3 miles to the westward of Too's Marshes Light-house shoals extend out nearly 1 mile into the river. On the southern shore the shoals extend out about ½ mile until past Wormley's Creek. The shoaling is abrupt on both sides of the channel.

3. ***From Yorktown to West Point.***—***Note.***—The channel between Yorktown and the Lower Middle Ground, a distance of 6¼ miles, has a width of ½ mile, and leads nearly in the middle of the river. From the Lower Middle Ground to the **Lower Cut**, a distance of 8 miles, the channel varies from 600 yards to 200 yards in width, the latter width being at the Upper Middle Ground. Between the Lower Cut and the **Upper Cut**, a distance of 5 miles, the channel has an average width of about 400 yards. The flats on both sides of the channel are in many places covered with fish and oyster-stakes.

Pass midway between the wharves at Yorktown and Gloucester Point and steer about **NW.** Standing on this course, *Sandy Point Shoal buoy* (can, black, No. 5) should be made a little on the port bow and left on the port hand. Continuing the **NW.** course, *Poplar Creek Flats buoy* (nun, red, No. 4) should be made on the starboard bow and be left on the starboard hand. Continue the **NW.** course past this buoy and haul a little to the northward; look out for *Page's Rock buoy* (nun, red, No. 6) and the single pile-beacon $\frac{3}{10}$ mile **NW.** ½ **W.** from Page's Rock; both should be made on the starboard bow and left on the starboard hand. When nearly up to Page's Rock buoy (nun, red, No. 6), change course to **N.** by **W.** ¾ **W.**; *Lower Middle Ground buoy* (can, black, No. 7) should be made on the port bow and left on the port hand when passing; Jones' Wharf, the long wharf at the village of **Clay Bank**, will be ahead. When nearly up to Jones' Wharf, shape the course **NW.** ¾ **N.**, giving the eastern shore a berth of about ⅓ mile. Standing on this course about 3¾ miles, the *Upper Middle Ground buoy* (can, black, No. 9) should be made about ¾ mile ahead. The fish-stakes and wharves extend out nearly to the edge of the channel from the north shore, and the flats along the south shore are full of oyster-stakes on their shoalest parts in this stretch of the river.

When nearly up to black buoy No. 9 haul to the northward and leave it on the port hand. (The channel is only 200 yards wide abreast this buoy.) When buoy No. 9 is abaft the beam, steer **NW.** ½ **N.** nearly 2 miles until *Lower Entrance Cut buoy* (nun, red, No. 8) bears about **N.** by **W.** Head up so as to leave this buoy on the starboard hand, and when up to it steer about **NW.**, following the buoys of the cut (spar, red, Nos. 10 and 12) and leaving them close-to on the starboard hand. Leave red nun-buoy No. 14 on the starboard hand, and continue the **NW.** course until **Bell's Rock Light-house** bears **N NW.** ¼ **W.**; steer for the light-house on this bearing, leaving red buoy No. 16 on the starboard hand. *Ware Creek Flats buoy* (spar, black, No. 11) will be made a little on the port bow. Pass between the light-house and Ware Creek Flats buoy, and bring the former to bear **SE.** by **E.** ¼ **E.** and steer **NW.** by **W.** ¼ **W.**, keeping the light-house on the bearing astern. The buoys at the entrance to the **Upper Cut**, *Goff's Point Shoal buoy* (nun, red, No. 18) and *Baker's Creek Flats buoy* (can, black, No. 13), will be made ahead, and on approaching them closer the black spar-buoys (Nos. 15, 17, 19, and 21), marking the western edge of the cut, will be seen. Enter the cut, steering about **N NW.** ¼ **W.**, and follow the black buoys, leaving them close-to on the port hand. *West Point Spit buoy* (spar, red and black horizontal stripes) will be left on the starboard hand. When up to the *Upper Entrance to Cut buoy*

(can, black, No. 23) continue the **N NW. ¼ W.** course, and anchor off the railroad company's docks.

Note.—From Bell's Rock Light-house to the entrance of the Upper Cut the tidal current sets diagonally across the channel, and allowance should be made for it.

MOBJACK BAY†

This is a large irregular bay making into the western shore of Chesapeake Bay, about 17 miles north of Old Point Comfort and just to the northward of York River entrance. There is good anchorage in the bay, sheltered from all but southerly and southeasterly winds; many vessels bound up and down the bay come to anchor for the night inside of New Point Comfort Light-house (at the northern side of the entrance) in 12 to 21 feet of water, according to draught.

Several rivers empty into the bay, but there are no towns or villages of importance upon it or its tributaries. Vessels of 12 feet and less draught trade in the bay and rivers; the principal cargoes consist of farm produce, lumber and oysters. The bay is principally the resort of vessels engaged in dredging for oysters. Extensive shoals make out from the shores in many places; some of these are indicated by fish and oyster-stakes which cannot, however, be taken as guides to define the limits of the shoals.

East River empties into the northern side of Mobjack Bay about 4¾ miles **NW.** from New Point Comfort Light-house. It has a narrow channel for 3½ miles from its mouth, with a least depth of 14 feet. **Pudding (Pullin) Creek** is a small shallow stream emptying into East River about 3¼ miles above its mouth; the village of **Matthew's Court House** is at the head of the creek. **Williams' Wharf**, on the east shore, about 3 miles above the mouth of East River, and **Hicks' Wharf**, just above and on the western shore, are the principal landings on the river. Steamers of the Old Dominion Line from Norfolk make regular trips to East River for passengers and freight. The entrance is marked by buoys and the channel follows the middle of the river.

North River, emptying into the northern part of Mobjack Bay, is over 1¼ miles wide at its mouth, but has large shoals on both sides, which leave a channel about ⅝ mile wide at the entrance and narrower above. Two of the shoals on the western side of the channel are marked by buoys. 10 feet of water may be carried about 5 miles up the river. **Blackwater River**, a small stream of no importance, empties into the northern side of North River about 3½ miles above its mouth.

Ware River, emptying into the western side of the head of Mobjack Bay, is navigable for 6 miles above its mouth by vessels of 8 feet draught, and a draught of 12 feet can be taken about 4 miles up it to **Wilson's Creek**. The channel is crooked, but the most prominent dangers are marked by buoys. A steamer of the Old Dominion Line makes regular trips between Norfolk and landings on the river.

Severn River empties into the western side of Mobjack Bay 5 miles **W NW. ½ W.** from New Point Comfort Light-house. It is formed by the union of two branches, the **Northwest Branch** and **Southwest Branch**, and is navigable about 4 miles from its mouth for vessels of 12 feet draught, and 5 miles for vessels of 8 feet draught. The channel is narrow and crooked; shoals extend out some distance from the shores on both sides. There are no aids to assist a stranger in entering the river.

Aids.—The shores on both sides of the entrance to Mobjack Bay are low and thickly wooded; they present no prominent marks readily distinguished by a stranger. **New Point Comfort Light-house** and York Spit Light-house (see table, page 16) are the most prominent aids in approaching (see view). The buoys marking the prominent shoals will be readily distinguished in the daytime with clear weather.

Pilots are not necessary for entering Mobjack Bay for an anchorage, but strangers bound into the tributaries should take a pilot, anchoring in the bay until one is procured. Pilots competent to take vessels up any of the rivers will be found among the oystermen working in the bay.

Tides.—The mean rise and fall of tides is 2.4 feet.

SAILING DIRECTIONS, MOBJACK BAY.

1. ***Approaching Mobjack Bay.—From the Southward.***—Follow the directions in Sections 1 and 2, "Sailing Directions, Chesapeake Bay," and when up to the Turn of Channel buoy, steer **N NW. ¼ W.** with the buoy astern. Keep this course until York Spit Light-house bears **SW.** by **W. ¾ W.** on the port beam, distant about 1½ miles, and then follow the directions in Section 2.

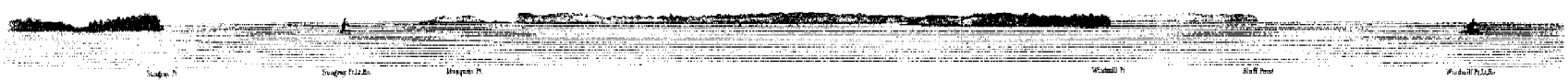
Or, having come from Hampton Roads and drawing 12 feet or less, stand out of the Roads, passing south of Thimble Shoal Light-house, and when ½ mile to the eastward of it shape the course **N. ¾ E.** While on this course be careful not to bring Thimble Shoal Light-house to bear to the southward of **S.** by **W. ¼ W.** until Back River Light-house bears **W.** When Back River Light-house bears **W.**, distant about 2½ miles, shape the course **N. ¼ E.**, keeping the course until York Spit Light-house bears **SW.** by **W. ¾ W.**, distant about 1½ miles. Then follow the directions in Section 2.

Note.—At night the lights will be sufficient guides.

† Shown on Coast and Geodetic Survey charts: **132**, scale $\frac{1}{80,000}$, price $0.50; **367**, scale $\frac{1}{400,000}$, price $0.50.

Entrance to York River and Mobjack Bay, York Spit Lt.Ho. bearing N by W.¼W, distant 1¼ Miles, and Toos Pt.Lt.Ho. N.W. by W.¼W, distant 7¾ Miles.

Entrance to Piankatank River, Stingray Pt.Lt.Ho. bearing NW by W.¼W, distant 3¾ Miles.



Entrance to Rappahannock River, Windmill Pt.Lt.Ho. bearing N. by W. distant 3¼ Miles.

Remarks.—On the **N NW. ¼ W.** course, York Spit Light-house should be made well on the port bow and receive a berth of at least 1 mile. New Point Comfort Light-house should be made right ahead at night or on a clear day.

New Point Comfort is a long low point composed of several small islands, backed by thick woods on the mainland; the white light-tower shows prominently on the southern end of the point.

The **N. ¾ E.** course, having come from Hampton Roads, leads across The Horseshoe with a least depth of 15 feet; watch the bearing of Thimble Shoal Light-house and guard against being set to the westward into shoal water. On the **N. ¼ E.** course York Spit Light-house should be made well on the port bow. Give this light a berth of at least 1 mile.

Dangers.—**The Horseshoe** is decribed on page 34.

Plum Tree Bar and the shoals making out from the entrance to Back River are described on page 47.

York Spit is described on page 50.

New Point (Middle Ground) Shoal lies fair in the entrance to Mobjack Bay, and bears **NE.** by **N.**, distant 3¼ miles from York Spit Light-house, and **SE.**, distant 3¾ miles from New Point Comfort Light-house. The shoal is nearly 1¼ miles long in an **E.** and **W.** direction and ¾ mile wide, with depths of 16 to 18 feet. At its eastern end it is marked by a buoy (can, black, No. 3), marked "New Point Middle Ground," in white letters.

New Point Comfort Shoal is described under Section 1 A, following.

1 A. ***Approaching Mobjack Bay.—From the Northward.***—When Wolf Trap Light-house is made, steer so as to pass 2 miles to the eastward of it. When the light-house bears **NW.**, distant 2 miles, make good the course **SW.** by **S.** until New Point Comfort Light-house bears **NW. ½ W.**; change course to **W.**, keeping this course until New Point Comfort Light-house bears **N.** by **E.**, about 1½ miles distant; then shape the course **NW. ½ N.** up the bay, following the directions in Section 2.

Remarks.—The **SW.** by **S.** course leads fair between New Point Comfort Shoal and New Point (Middle Ground) Shoal. York Spit Light-house should be made and kept on the port bow. New Point Comfort and light-house will be broad off the starboard bow, and as it is approached York River entrance will be opened out to the southwestward of the light-house. Too's Marshes Light-house, on the south side of York River entrance, will be seen at night. When the course is changed to **W.** you should be between the black buoys marking New Point Comfort Shoal and New Point (Middle Ground) Shoal. On the **W.** course you will be heading for the low marshy islands off the north point of the entrance to York River, and on a clear day Too's Marshes Light-house will be seen.

Dangers.—**Wolf Trap Spit** makes out 3 miles from the western shore of the bay, about 6½ miles to the northward of New Point Comfort. It is marked by **Wolf Trap Light-house** (see table, page 16), and ½ mile to the eastward, off the edge of the spit, is a buoy (can, black, No. 7). **A Shoal**, marked by a black buoy on its eastern side, is located 1⅝ miles, **S SE. ¾ E.** from Wolf Trap Light-house. This shoal has been recently reported and is not yet developed.

A shoal with a least depth of 14 feet over it lies about 2 miles **S SW. ½ W.** from Wolf Trap Light-house. To avoid it, vessels should keep Wolf Trap Light-house bearing to the northward of **N NE.**; this bearing will also clear the shoals off New Point Comfort.

New Point Comfort Shoal extends nearly 2 miles in a southeasterly direction from New Point Comfort Light-house. It has 10 to 16 feet of water over it, and is marked at its southeastern point by a buoy (can, black, No. 5).

New Point (Middle Ground) Shoal is described under Section 1, preceding. **York Spit** is described on page 50.

New Point Comfort Spit makes out ¾ mile to the southwestward from New Point Comfort Light-house. It is marked at its western end by a buoy (nun, red, No. 2).

2. ***Entering and proceeding up Mobjack Bay.***—With York Spit Light-house bearing **SW.** by **W. ¾ W.**, distant 1 to 1½ miles, shape the course **NW. ½ N.** This course made good for 11½ miles will lead to Ware and North rivers Junction-buoy (spar, red and black horizontal stripes).

Note.—To make an anchorage in the mouths of the tributaries to Mobjack Bay see Section 3.

Strangers should not enter the tributaries of Mobjack Bay without a pilot (see General Description, page 52). There is good anchorage anywhere in the channel of Mobjack Bay.

Remarks.—The **NW. ½ N.** course leaves to the northward New Point (Middle Ground) Shoal, New Point Comfort Shoal, and the shoals making out to the westward of New Point Comfort; to the southward is left York Spit and the shoals making out from the shore between York and Severn rivers. When New Point Comfort Light-house approaches a **N NE.** bearing, red nun-buoy No. 2, on New Point Comfort Spit, will be on the starboard bow, and the red spar-buoys marking York Spit Swash Channel on the port bow. Standing farther in on this course, red spar-buoy No. 4, marking Dutchman's Bluff Flats, will be made on the starboard bow, and East River will be opened out to the northward, showing several buoys at the entrance. Severn River and Little Ware River will be opened out on the port bow. The point between North River and Ware River is heavily wooded, and will be easily recognized ahead as approached on the **NW. ½ N.** course.

Dangers.—**York Spit** is described on page 50. **New Point (Middle Ground) Shoal** is described above. **New Point Comfort** Shoal and Spit are described under Section 1 A, preceding.

Dutchman's Bluff Flats make out nearly a mile from the eastern shore, about 2¼ miles above New Point Comfort Light-house. They have 3 to 9 feet over them, and are marked at their western edge by a buoy (spar, red, No. 4).

Cedar Point Flats make to the southward about ¾ mile from **East River (White's) Point**, the western point of entrance to the East River. These flats have 3 to 4 feet of water over them, and are marked by a buoy (spar, black, No. 1) which is placed off their southeastern point.

Shoals make out from the western shore for 1½ miles between the western point of entrance to the bay and the mouth of the Severn River.

A shoal extends to the eastward 1¼ miles from the northern point of entrance to the Severn River, and is marked by a buoy (spar, red and black horizontal stripes).

A shoal extends to the southeastward from Ware Point, the point between Ware and North rivers, and is marked at its southeastern end by a buoy (spar, red and black horizontal stripes).

3. ***To an anchorage in the mouths of tributaries to Mobjack Bay.***—Strangers should not attempt to proceed far up the tributaries without a pilot.

I. ***To enter East River.***—Following the directions in Section 2, when 1½ miles past Dutchman's Bluff Flats buoy (spar, red, No. 4), steer **N.**, heading fair between the buoys in the entrance of the river. Anchor when abreast Cedar Point Flats buoy (spar, black, No. 1).

Remarks.—The channel above the buoys at the entrance follows a general mid-river course; strangers desiring to enter the river should engage a pilot at the entrance.

II. ***To enter Severn River.***—Follow the directions in Section 2 until New Point Comfort Light-house bears **E SE.**, then steer **W NW.** Anchor when Ware and Severn rivers Junction-buoy (spar, red and black horizontal stripes) bears **NE.**, distant ½ to ¾ mile.

Remarks.—The river channel is not buoyed and is full of oyster-stakes. Strangers should not enter.

III. ***To enter North River.***—Follow the directions of Section 2, and when nearly up to the North and Ware rivers Junction-buoy (spar, red and black horizontal stripes) haul a little to the northward and anchor with the junction-buoy bearing **S SW.**, distant ½ mile.

IV. ***To enter Ware River.***—Follow the directions in Section 2, and when nearly up to the North and Ware rivers Junction-buoy haul a little to the westward and anchor with the junction-buoy bearing **E NE.**, distant ½ mile.

PIANKATANK RIVER†

This river empties into the western side of Chesapeake Bay about 32 miles above Old Point Comfort and just below the entrance to Rappahannock River. The river is navigable 14 miles, to the settlement of Freeport, for vessels of 7 feet draught; 12 feet can be taken up to within 2½ miles of Freeport, where there is a bar with a depth of 6½ feet. Vessels of over 7 feet draught usually load part of their cargo above the bar and finish loading from lighters 2½ miles below Freeport. Lumber, cord-wood, and railroad-ties are shipped from the landings on the river, principally in vessels engaged in the bay trade.

The entrance between Stingray Point on the north and Cherry Point on the south is about 2½ miles wide, but the channel above the entrance is narrow and crooked in some places, and though it is buoyed, some local knowledge is necessary for its safe navigation.

Hill's Bay, in the south side of the entrance west of Cherry Point, is a large bight which forms the approach to **Milford Haven** and its several creeks, and also to **Queen's Creek**. These waters are of little importance, and are frequented mainly by local craft of light draught. Steamers from Baltimore make regular trips to Milford Haven.

Tides.—The mean rise and fall of tides at Cherry Point is 1.3 feet.

GENERAL DIRECTIONS, PIANKATANK RIVER.

Strangers should not attempt to go above the anchorage without a pilot. The directions lead in the best water.

1. ***Approaching and Entering.—From the Southward.***—Standing up the bay, pass about 1 mile to the eastward of Wolf Trap Light-house and steer **N.** by **W.** *Obstruction buoy* (can, red and black horizontal stripes) and *Milford Haven Spit buoy* (can, black, No. 7½) will be left on the port hand. When Stingray Point Light-house is made bearing to the westward of **N NW. ½ W.** steer for it, and when it is ¾ mile distant, steer about **WSW. ¼ W.** On this course *Cherry Point Flats buoy* (spar, black, No. ½) will be left about 1 ¼ mile on the port hand, and *Cherry Point Spit outer buoy* (can, black, No. 1) will be made broad off the port bow; to the southward of the latter several spar buoys will be seen. Haul gradually to the southward and pass Cherry Point Spit outer buoy, leaving it about 100 yards on the port hand, and then steer about **S SW.**, leaving *Cherry Point Spit inner buoy* (spar, black, No. 3) on the port hand and *Stove Point Spit buoy* (spar, red, No. 2) on the starboard hand. Anchor when to the southward of the latter buoy, in the entrance of Hill's Bay. The entrance to Milford Haven lies in the southeastern end of Hill's Bay, but cannot be distinguished by a stranger. It is marked by two buoys, but local knowledge is necessary for entering.

† Shown on Coast and Geodetic Survey charts: **132**, scale $\frac{1}{80,000}$, price $0.50; **367**, scale $\frac{1}{400,000}$, price $0.50.

1 A. *Approaching and Entering.—From the Northward.*—Coming down the bay, pass to the eastward of *Rappahannock Spit buoy* (can, black, No. 9). Round this buoy, leaving it ½ mile on the starboard hand, and when it bears **N.** steer **W SW.** ¼ **W.** This course made good will lead ¾ mile south of Stingray Point Light-house, and *Cherry Point Spit outer buoy* (can, black, No. 1) will be made a little on the port bow. Round black can-buoy No. 1, leaving it 100 yards on the port beam, and follow the directions under Section 1 foregoing.

Note.—The flood-current, when on the **W SW.** ¼ **W.** course, has a tendency to set a vessel to the northward, and the ebb to the southward. The direction of the wind and its force must be considered when making allowance for the current.

RAPPAHANNOCK RIVER.†

The Rappahannock River empties into the western side of Chesapeake Bay about 35 miles north of Old Point Comfort and just north of the mouth of the Piankatank River. The general direction of the river is about **NW.** and **SE.**, and it is navigable to the city of Fredericksburg, about 90 miles above its mouth. This river is of considerable commercial importance, vessels owned on Chesapeake Bay and strangers being engaged in the carrying trade, which comprises cargoes of oysters, farm produce, general merchandise, wood, and railroad-ties, the latter mostly carried in barges, which are towed. Lines of steamers from Baltimore and Norfolk make regular trips to the landings on the river as far as Fredericksburg.

The rivers and creeks flowing into Rappahannock River are of no commercial importance, except Corrotoman River and Urbana and Carter's creeks.

Carter's Creek empties into Rappahannock River from the northward, about 10 miles above Stingray Point Light-house. The creek has a narrow crooked channel, and is the resort of oystermen; strangers should not attempt to enter it. The village of **Carter's Creek** is situated on the creek.

Corrotoman River empties into Rappahannock River from the northward, about 11½ miles above Stingray Point Light-house. **Millenbeck** is a village on the west bank of the river, just inside its mouth. Vessels of 8 feet draught can go up as far as **Old Orchard** on the **West Branch**, and to **Forest Landing** on the **East Branch**. Strangers entering should take a pilot at Carter's Creek.

Urbana Creek empties into the river from the southward, 15 miles above Stingway Point Light-house. A dredged channel, marked by buoys, leads into the creek up to the wharves of the village of Urbana; about 10 feet of water can be taken through this channel at high water. The village of **Urbana** has some trade, and is a landing for the steamers plying between Baltimore, Norfolk, and Fredericksburg.

The other tributaries of the Rappahannock River are shallow; some of them have a little trade, carried in light-draught craft.

Tappahannock is a village on the west bank of the river, about 38 miles above its mouth. It has some trade, and can be reached by vessels of 14 feet draught. Steamers plying on the river make a landing at the village. Strangers bound up the river should here take a pilot.

Port Royal, a town on the west bank of the river, about 64 miles above its mouth, has some trade in grain and farm produce, carried in vessels owned elsewhere and by steamers from Baltimore and Norfolk. The deepest draught taken to Port Royal at high water is 12 feet.

Port Conway is a village on the east bank of the river, opposite Port Royal.

The city of **Fredericksburg** is on the west bank of the river, about 90 miles above its mouth. It has large manufacturing interests and considerable trade by water, the carrying being done principally by steamers and barges engaged in the bay trade. The deepest draught that can be taken to the wharves of the city is 8 feet at low water.

Prominent Features.—Windmill Point, the northern, and **Stingray Point**, the southern point of entrance to the river, are low and covered with a thick growth of trees. Stingray Point shows very prominently, and when seen from the southeastward two remarkable notches in the trees will be noticed. **Windmill Point Light-house** and **Stingray Point Light-house** (see table, pages 16-18) are the most prominent objects seen, and readily recognized when approaching the entrance. The first-class black can-buoy No. 9, off the end of Rappahannock Spit, can be easily distinguished.

The Channel from the mouth of the river to Tappahannock, about 38 miles above, is comparatively straight, gradually decreases in width, and leads between the shoals which make out from both banks. The principal dangers are marked by buoys and **Bowler's Rock Light-house** (see table, page 16), the latter on the west side of the channel about 28 miles above the mouth of the river. Above Tappahannock the channel is narrow and crooked, and in

†Shown on Coast and Geodetic Survey charts: **392, 393,** scale of each $\frac{1}{60,000}$, price of each $0.20; **394, 395,** scale of each $\frac{1}{20,000}$, price of each $0.20; **396,** scale $\frac{1}{40,000}$, price $0.20; **397,** scale $\frac{1}{20,000}$, price $0.20. The foregoing 6 sheets include the river from its mouth to Fredericksburg. The entrance of the river to Corrotoman River is also shown on chart **132,** scale $\frac{1}{80,000}$, price $0.50, and the river is also shown on chart **376,** scale $\frac{1}{400,000}$, price $0.50.

places obstructed by bars, which, under the supervision of the U. S. Engineers, are being improved by dredging and the construction of dikes. Some of the prominent dangers are marked by buoys above Tappahannock, but the channel can only be followed by those acquainted with it.

Anchorages.—Good anchorage for heavy-draught vessels will be found in the mouth of the river south of Mosquito Point. Vessels standing up the river can anchor anywhere in the channel where the bottom is soft.

Pilots.—Strangers bound up the river usually take a pilot at Urbana or Tappahannock. No stranger should attempt to go above the latter place without one. Pilots for the upper part of the river can also be found at Port Royal.

Supplies.—Coal can be had at the wharves at Fredericksburg, and provisions can be obtained in Tappahannock, Port Royal, and Fredericksburg.

Freshets in spring and fall are of short duration; the river sometimes rises 20 feet at Fredericksburg, but only a little at Tappahannock.

Ice, during severe winters, closes the river to its mouth; when breaking up it is very destructive to the wharves.

Currents.—The tidal currents generally follow the direction of the channel.

Tides.—The mean rise and fall of the tides at the mouth of the river is 1.3 feet, at Tappahannock 1.6 feet, and at Fredericksburg about 2.8 feet. It is high water at the mouth of the river $1^h\ 38^m$ after high water at Old Point Comfort, and at Tappahannock $2^h\ 42^m$ later than at the mouth of the river.

SAILING DIRECTIONS, RAPPAHANNOCK RIVER.

1. ***Approaching and Entering.—From the Southward.***—Following the directions in Section 3, "Sailing Directions, Chesapeake Bay," page 28, when Wolf Trap Light-house bears **W.**, distant about 1¾ miles, steer **N.** by **W.** ¾ **W.** 12¼ miles. This course will lead fair between Stingray Point and Windmill Point light-houses. When midway between the light-houses, steer **W NW.** ½ **W.** until up to Mosquito Point. The shoal making out from this point is marked by a buoy (spar, red, No. ½).

At night.—Steer for Stingray Point Light-house on any bearing between **N NW.** ½ **W.** and **W.** ¾ **S.** Round the light, leaving it 1¼ miles on the port hand, and pass about midway between it and Windmill Point Light-house; then steer **W NW.** ½ **W.** about 2½ miles, and anchor in 4¾ fathoms water to await daylight.

Remarks.—On the **N.** by **W.** ¾ **W.** course, heading fair between the light-houses, Windmill Point Light-house and Stingray Point Light-house will present the same appearance (see view); **Windmill Point** (low, covered with trees) will be right ahead. Rounding Stingray Point Light-house and standing into the mouth of the river on the **W NW.** ½ **W.** course, **Mosquito Point** (long, low, bare at its southern end, on the north shore 4 miles west of Windmill Point) will be a little on the starbord bow, and **Grey's Point** (showing an abrupt end covered with trees, on the south shore 3½ miles west of Mosquito Point) will be right ahead. Sturgeon Creek Shoal buoy (spar, black, No. 1) will be on the port bow and left on the port hand. A good anchorage will be found about 1¼ miles **SW.** from Mosquito Point, in 3¼ to 7 fathoms water.

Dangers.—*Obstruction buoy* (can, red and black horizontal stripes) and *Milford Haven Spit buoy* (can, black, No. 7½), both lying to the northwestward of Wolf Trap Light-house, mark dangers described on page 29, and should be left on the port hand.

Stingray Point Shoal, making out about 1½ miles to the eastward from Stingray Point, has 2 to 5 feet of water over it, and is marked near its eastern end by **Stingray Point Light-house** (see table, page 16).

Rappahannock Spit, making out 4¼ miles in a general **E SE.** direction from Windmill Point, has from 6 to 17 feet over it, and is marked near its middle by **Rappahannock Spit Light-house** and at its eastern end by a buoy (can, black, No. 9). Vessels of less than 13 feet draught can cross the spit between the light-house and buoy by passing at least 1 mile to the eastward of the light-house.

Shoals make out 1¼ miles from the north shore just to the eastward of Mosquito Point and about ½ mile to the southward of Windmill Point. The north side of Stingray Point should be given a berth of at least 1 mile on account of shoals.

Sturgeon Creek Shoal, marked off its northern end by a buoy (spar, black, No. 1), makes out 1 mile from the south shore at the mouth of Sturgeon Creek, about 2¼ miles west from the end of Stingray Point.

1 A. ***Approaching and Entering.—From the Northward.***—Standing down the bay, keep Rappahannock Spit Light-house on the starboard bow and pass at least 2½ miles to the eastward of it. When Stingray Point Light-house bears **W.** ¾ **S.** steer for it, keeping it on that bearing until Rappahannock Spit Light-house bears **NW.** by **N.** Then shape the course **W NW.** ½ **W.**, heading fair between Stingray Point and Windmill Point, and continue the course up to Mosquito Point.

Note.—The above directions will answer at night. After passing midway between the two light-

houses on the **W NW.** ½ **W.** course, continue the course about 2½ miles, when anchor and wait for daylight.

For "Remarks" and "Dangers" see Section 1.

2. ***From Mosquito Point to Tappahannock.***—Pass Mosquito Point, leaving the buoy (spar, red, No. ½) about ⅜ mile on the starboard hand, and steer **NW.** by **W.**, with Stingray Point astern for about 4¼ miles. Grey's Point should then bear **S.** ¾ **E.**, and the vessel be in mid-stream. From this position steer **W.** ½ **N.**; *Toll's Point Shoal bucy* (spar, red, No. ¾) should be made a little on the starboard bow and left on the starboard hand. The entrance of Corrotoman River will be passed on the starboard hand. Pass Toll's Point Shoal buoy (spar, red, No. ¾), and when it is ¾ mile distant on the starboard quarter, steer **NW.** ¾ **N.** a little over 2½ miles. The village of Urbana, at the mouth of Urbana Creek, will be passed on this course on the port hand.

When the eastern point of entrance of Urbana Creek bears **SW.** by **S.**, steer **N.** ¾ **W.** about 3¼ miles, heading for the wharf at **Carter's Landing.** On this course the channel favors the eastern shore. When the wharf at Carter's Landing is ahead, about 1 mile distant, and the eastern shore of the river about ½ mile distant, steer **NW.** ¼ **N.** Carter's Landing will be left ½ mile on the starboard hand, and *Punch Bowl Shoal buoy* (spar, black, No. 3) will be made a little on the port bow and should be left on the port hand. When abreast it steer **NW.** by **W.** ½ **W.** *Tarpley's Point Shoal buoy* (spar, red, No. 2) will be made a little on the starboard bow and left about 100 yards on the starboard hand; **Jones' Point,** on the southern shore, will be right ahead. The shoal off Jones' Point is covered with oyster-stakes, and the bare yellow bluffs just below the point show prominently when coming up the river.

Continue the **NW.** by **W.** ½ **W.** course until about ¼ mile past Tarpley's Point Shoal buoy, and then steer **NW.** ½ **N.**, keeping *Jones' Point Shoals buoy* (spar, black, No. 5) on the port bow. Leave Jones' Point Shoal buoy about 300 yards on the port hand and shape the course **NW.** ¼ **W.** for Bowler's Rock Light-house. On this course *Dumpling Shoals buoy* (spar, black, No. 7) will be made on the port bow and should be left on the port hand. *Dumpling Rock buoy* (spar, red, No. 4) and *Bowler's Ledge buoy* (spar, red, No. 6) should be made a little on the starboard hand. There are oyster-stakes on the shoals on both sides of the channel; above Bowler's Rock Light-house the stakes are in rows about ⅛ mile apart and extend out from the shore to the edge of the channel; the end-stakes, in many cases, have bushes on top.

When up to Bowler's Rock Light-house, leave it 100 to 150 yards on the port hand and steer **N NW.** ¾ **W.** until **Accaceek Point** (three very conspicuous trees on end, on the north shore, 3¾ miles above Bowler's Rock Light-house) is on the starboard beam, distant about 700 yards. On this course **Lowry's Point** (on the south shore, about 5¼ miles above Bowler's Rock Light-house) will be a little on the port bow, and the light-house will be a very little on the port quarter; the fish-stakes are the best guides to keep in the channel. When Accaceek Point is abeam, steer **N NW.** nearly 1 mile. When standing on the **N NW.** course, look out for *Ross Rocks buoy* (spar, red, No. 8), which will be well off the port bow. When Lowry's Point bears **NW.** by **W.** ¾ **W.** a **NW.** course should be steered, leaving red spar-buoy No. 8 on the starboard hand. *Upper Jones' Point buoy* (spar, black, No. 9), which will be made nearly ahead, should be left on the port hand. When abreast it steer about **NW.** by **W.** ½ **W.**, heading for the end of the landing, and anchor in the channel about 500 yards from the shore abreast the town of Tappahannock.

COAST FROM RAPPAHANNOCK RIVER ENTRANCE TO GREAT WICOMICO RIVER ENTRANCE.†

This stretch of coast, between Windmill Point and Smith's Point, is about 17 miles long. It is generally low and is indented by numerous creeks and the Great Wicomico River. Shoals, between which buoyed channels lead into the mouths of the principal creeks and the Great Wicomico River, extend out from the shore in many places; off the mouth of Dividing Creek they extend out about 3 miles. Strangers seldom enter the creeks between the Rappahannock and Great Wicomico rivers unless assisted by a pilot.

LITTLE (FLEET'S) BAY AND ANTEPOISON CREEK

are on the north side of Windmill Point. They are of little importance and only entered by small vessels engaged in the local trade; 9 feet of water can be carried, in a narrow channel, through Little Bay and 1 mile up Antepoison

† Shown in part on each of Coast and Geodetic Survey charts: 132 and 133, scale of each $\frac{1}{80,000}$, price of each $0.50; 376, scale $\frac{1}{400,000}$, price $0.50.

Creek. A red spar-buoy marks the turning-point entering Antepoison Creek from Little Bay. Strangers should not enter without a pilot.

DIMER'S CREEK

has a depth of 14 feet in the channel for a distance of 1½ miles above its mouth; above this the depth decreases gradually toward its head. The entrance to the creek lies about 1½ miles **NW.** by **N.** from North Point, the eastern point of entrance to Little Bay, and the channel at the entrance is marked by several buoys. Strangers seldom enter the creek; steamers from Baltimore make regular trips to the landing. Sailing directions of practical value cannot be given; Coast and Geodetic Survey chart No. 132 is the best guide.

Tapp's Creek, just to the southward of Dimer's Creek, has a narrow crooked channel, and is of little importance as local knowledge is necessary to enter.

INDIAN CREEK

is the next creek to the northward of Dimer's Creek; it has a depth of 15 feet in the channel for a distance of 1¾ miles above its mouth. This creek is of no importance to strangers. The channel is narrow, has no aids, and requires local knowledge for its navigation.

DIVIDING CREEK

makes into the western side of Chesapeake Bay about 6½ miles north of Windmill Point. It has several smaller tributaries, and is frequented principally by vessels engaged in the bay trade; steamers from Baltimore also make a landing on the creek. The channel into the creek is marked by buoys and has a least depth of 15 feet for a distance of 1½ miles above Hughlett's Point, the northern point of entrance. Shoals extend out nearly 3 miles to the eastward from the mouth of the creek. Strangers should not enter without a pilot.

Ingram's Cove and **Ball's Creek** are two small shallow and unimportant streams north of Dividing Creek.

GENERAL DIRECTIONS.

From Rappahannock Spit-buoy.—*To approach Little Bay or Dimer's and Indian Creeks.*—Bring Rappahannock Spit-buoy (can, black, No. 9) to bear **SW.**, distant ½ mile, and steer **NW.** ½ **N.** about 6¼ miles. *Antepoison Flats buoy* (spar, black, No. 1) should then be ½ mile distant abaft the port beam. Now steer about **W NW.** ½ **W.** for 1 mile, and anchor in 3 to 4½ fathoms water until a pilot can be obtained.

From Rappahannock Spit-buoy.—*To approach Dividing Creek entrance.*—Bring Rappahannock Spit-buoy (can, black, No. 9) to bear **SW.**, distant about ¼ mile, and steer **N NW.** for 8½ miles. *West Flats buoy* (spar, black, No. 1) should then be about ¼ mile off the port beam. Anchor in 3 to 5 fathoms water just to the northeastward of this buoy, or, follow the buoys which will be seen to the westward, leaving them on their proper sides, and anchor in the channel of the creek.

From Smith's Point.—*To approach Dividing, Indian, and Dimer's creeks, and Little Bay.*—When Smith's Point Shoal lower buoy (can, black, No. 11) bears **W.**, distant about ¼ mile, steer **S.** by **W.** ¾ **W.** about 11 miles, until the southern end of Bluff Point bears **W SW.** ¾ **W.**, and then—

If bound into Dividing Creek, steer about **W NW.**, and anchor to the eastward of *West Flats buoy* (spar, black, No. 1).

If bound into Little Bay, or Antepoison, Dimer's, and Indian creeks, steer **SW.** ½ **S.** until *Bluff Point Shoal buoy* (spar, red and black horizontal stripes) bears **N.**, distant ½ mile, and then steer **W SW.** ½ **W.** about 1 mile, and anchor to the northeastward of *East Flats buoy* (spar, red, No. 2) until a pilot is obtained.

GREAT WICOMICO RIVER.†

This river empties into Chesapeake Bay about 5 miles south of Smith's Point; it flows in a general **SE.** direction and is navigable for a distance of 7½ miles, to Sampson's Wharf, for vessels of 7 feet draught; there is 18 feet of water in the channel for a distance of 4 miles above its mouth. The entrance of the river and the mouth of Cockle's (Cockrell's) Creek form a good anchorage, which is frequently used by vessels bound up and down the bay. Steamers from Baltimore make regular trips to the landings on the river. **Great Wicomico River Light-house** is on the shoal making off from the northern point of entrance and is the principal guide for entering the river. See table, page 18. **Fleet's Point**, the northern point of entrance, is wooded; it has several low bushy trees near the extremity, which is low and flat. There are several houses back from the point. **Dammeron's Marsh**, the southern point of entrance, is low and flat, but shows well when approaching the entrance. Shoals extend out from both points, leaving the channel at the entrance quite narrow.

Cockle's (Cockrell's) Creek is a small tributary of the river, emptying into its mouth just inside Fleet's Point, the northern point of entrance to the river. **Fair Port** is a small village on the east shore of the creek; it has some trade in wood, lumber, grain, oil and oysters, carried in coasting-vessels and vessels and steamers engaged in the bay trade; it has also two small marine railways and a store with general supplies.

†Shown on Coast and Geodetic Survey charts: **133**, scale $\frac{1}{80,000}$, price $0.50; **376**, scale $\frac{1}{400,000}$, price $0.50.

Ingram's Bay is the bight in the south shore of the entrance to the river, at the head of which is **Mill Creek**, an unimportant stream having a narrow channel with a depth of 9 to 16 feet for a distance of about 2 miles above its mouth. Ingram's Bay has extensive shoals, with 2 to 4 feet of water over them, between which a channel with a least depth of 13 feet leads to the mouth of Mill Creek. Strangers should not attempt to enter Mill Creek without a pilot. There are no aids.

The channel of Great Wicomico River at the entrance is a little over ¾ mile wide between the 12-foot curves, but widens somewhat inside Fleet's Point buoy (nun, red, No. 2) and until past the entrance to Cockle's Creek, above which it is narrow and crooked. At the entrance and up to Cockle's Creek the channel is marked by buoys, and in many places in the river oyster and fish-stakes extend out from the shores nearly to the edge of the channel. A stranger should not attempt to enter the river at night without a pilot.

Anchorages.—The usual anchorages for vessels in the river is to the westward of and in the mouth of Cockle's Creek, in 14 to 19 feet of water. The smaller class of vessels usually stand into the creek and anchor in mid-channel between Fair Port and its mouth.

Ice in severe winters closes the river to navigation.

Tides.—The mean rise and fall of tides is about 1.3 feet at the entrance of the river.

GENERAL DIRECTIONS FOR MAKING THE ANCHORAGE IN GREAT WICOMICO RIVER.

The following directions are good for vessels of 14 feet or less draught, in the daytime when the buoys can be seen. Some local knowledge is necessary to take in vessels of over 14 feet draught.

1. ***Approaching and Entering.—From the Southward.***—Leaving *Rappahannock Spit buoy* (first-class can, black, No. 1) about ¼ mile on the port hand, steer **N. ½ W.** for 11¼ miles; Great Wicomico River Light-house will then bear **N W. ¾ N.**; steer for it and leave *Dammeron's Marsh Shoals buoy* (spar, black, No. 1 and can, black No. 3) on the port hand. When nearly up to the light haul to the westward, course about **W NW. ¾ W.**, leaving *Fleet's Point Shoal buoy* (nun, red, No. 2) about 75 yards on the starboard hand. Continue the **W NW. ¾ W.** course a little over 1 mile beyond the light-house until *Fleet's Point Flats buoy* (nun, red, No. 4) bears **N.**, then steer about **NW.** and anchor off the mouth of Cockle's Creek.

1 A. ***Approaching and Entering.—From the Northward.***—Passing to the eastward of Smith's Point Light-house, leave *Smith's Point Shoal lower buoy* (first-class can, black, No. 11) about ¼ mile on the starboard hand, and steer **S SW. ½ W.** When Great Wicomico River Light bears **W.** by **S.**, steer for it. Pass to the southward of the light a little to the southward of *Fleet's Point Shoal buoy* (nun, red, No. 2), and when up to this buoy steer **W NW. ¾ W.** and proceed as directed in Section 1.

Remarks.—The water shoals gradually on both sides of the channel until up to the anchorage, above which it shoals more abruptly near the banks of the river.

POTOMAC RIVER.†

This important tributary of Chesapeake Bay empties into its western side about 60 miles above Old Point Comfort, and forms the boundary between the states of Maryland and Virginia. It is the approach to the cities of Alexandria, Va., and Washington and Georgetown, D. C. The river flows in a general southeasterly direction, and is navigable for large vessels as far up as Georgetown, about 102 miles above its mouth; above this it is navigable for barges up to the outlet of the Chesapeake and Ohio Canal. The deepest draught of vessels entering and bound up to Alexandria, Washington, or Georgetown is 20 feet; 22 feet have been taken up the river, but this is exceptional; 18 feet is about the heaviest draught that can conveniently be taken up the river, and this requires the assistance of steam. The vessels engaged in the carrying trade are principally the larger class of coasters, and occasionally foreign vessels enter the river bound to Georgetown. A large number of small vessels engaged in the bay trade are employed on the river. The entrance of the river between **Smith's Point** on the south and **Point Lookout** on the north is nearly 10 miles wide, but south of Point Lookout it is 5¾ miles wide. There are no shoals or dangers in the middle of the entrance, and those making out from the shores can be easily avoided by keeping in the middle of the river. **Smith's Point** is comparatively low. **Smith's Point Light-house** is on the shoal making out from the point and about 2 miles from it (see table of lights, page 18). **Point Lookout** is low, with a grove of trees some distance back from the extremity of the point. **Point Lookout Light-house** (described in the table of light-houses on page 18) is on the extremity of the Point. Potomac River has numerous rivers and creeks emptying into it; many of these are very shallow and of no commercial importance.

†Shown on Coast and Geodetic Survey charts: **388, 389, 390,** scale of each $\frac{1}{60,000}$, price of each $0.40; **391,** scale $\frac{1}{40,000}$, price $0.40; these charts include the river from its mouth to Georgetown, D. C. The entrance of the river is shown on chart **133,** scale $\frac{1}{80,000}$, price $0.50. Chesapeake Bay and tributaries are shown on chart **376,** scale $\frac{1}{400,000}$, price $0.50.

Little Wicomico River is shallow and of no importance. Its entrance is about ⅞ mile to the westward of Smith's Point.

Cornfield Harbor is formed by a curve in the shore just to the westward of Point Lookout. This harbor is sheltered from northerly and northeasterly winds, and vessels bound up or down the bay frequently use it as an anchorage for the night. When the wind hauls to the southward, vessels anchored here generally get under way and stand into the mouth of St. Mary's River.

Smith's Creek, emptying into the northern side of the river, about 5½ miles above Point Lookout, is mostly frequented by small vessels. The channel is narrow and is buoyed at the mouth. Vessels of 10 feet draught can pass up the river, into either of its two branches, 1 mile above its mouth, but strangers should take a pilot.

St. Mary's River empties into the Potomac from a northerly direction, about 7 miles above Point Lookout; it is the usual anchorage for vessels seeking shelter in the mouth of the Potomac from easterly winds (see heading "St. Mary's River," following).

St. George's River is a narrow, crooked, and unimportant estuary north of St. George's Island; it is entered from the mouth of St. Mary's River. This river is only frequented by vessels familiar with the locality, who come here for oysters and grain. The deepest draught entering is about 8 feet.

COAN RIVER

empties into the Potomac from the southward; the entrance is 13 miles above Smith's Point Light-house, and bears **W SW.** ½ **W.** from Point Lookout Light-house. This river has two branches—**The Glebe** and **Kingscote Creek**; it has good anchorage for small vessels, and is much frequented by oystermen engaged in the mouth of the Potomac. The river and branches have some trade in oysters, wood, lumber, and produce, carried principally by bay vessels, and steamers plying between Washington and Baltimore, which stop at the landings on the river. The principal landing is **Coan Wharf**, to which 11 feet can be carried. **Forrest Landing** is considered the head of navigation, to which 9 feet can be taken. The channel at the entrance is narrow, and is marked by several buoys. A stranger, over 8 feet draught, bound to any of the landings above the mouth of Kingscote Creek should take a pilot. Ice closes the river in severe winters.

YEOCOMICO RIVER

empties into the Potomac 16½ miles above Smith's Point Light-house and opposite the mouth of St. Mary's River. The entrance is 1 mile wide, but shoals make out on both sides, which contract the channel to a width of ⅜ mile. The river has three branches: the **Northwest**, **West**, and **South Yeocomico** rivers, and these again have smaller creeks emptying into them. **Kinsale** is the principal village; it is at the head of navigation on the West Yeocomico River, and is a landing for the steamers running between Washington and Baltimore. There is 16 feet of water in the channel up to Barn Point beacon; above this the water gradually shoals toward the head of the branches. The deepest draught taken into the river is 13 feet; 11 feet can be carried up to Kinsale. The trade of the river comprises cargoes of oysters, wood, timber, and farm produce, carried principally by vessels owned in Chesapeake Bay.

Lower Machodoc River empties into the Potomac from the southward, 6 miles above Piney Point Light-house. The entrance is nearly 1¼ miles wide, and contracts gradually when entering the river. The narrowest part of the channel is marked by buoys, above which is a good anchorage in 10 to 13 feet water, soft bottom. Shoals make out from the shore on both sides of the entrance.

NOMINI BAY AND CREEK AND CURRIOMAN BAY

are in the south shore of the Potomac, south of Blakistone Island Light-house. **Nomini Bay** is the approach to Currioman Bay and Nomini Creek, the former making to the westward and latter to the southward from the head of the bay. **Nomini Creek** is navigable 3½ miles, to the landing at **Nomini Ferry**, for vessels of 8 feet draught. At its entrance a dredged channel, marked by several buoys, and about 100 feet wide and 9 feet deep, leads across the bar into the deep water of the creek. Steamers make regular trips to Nomini Ferry. **Currioman Bay** is about 3 miles long in a **NW.** and **SE.** direction, and has from 7 to 10 feet of water in the channel. Produce, ship-timber, lumber, and oysters are shipped from the landing about 2 miles above the entrance of the bay. Steamers from Washington and Baltimore make regular trips to **Currioman Landing**. The deepest draught taken into the bay is 8 feet.

BRETON'S BAY

is an estuary of the Potomac, about 2½ miles **NE.** by **E.** from Blakistone Island Light-house. It extends in a general northeasterly direction about 5½ miles to **Leonardtown**, a small town at the head of navigation. The channel for a distance of 3½ miles from the entrance has a least depth of 15 feet; above this the depth gradually decreases, and the wharves of Leonardtown are reached through a dredged channel having a least width of 150 feet and depth of 8½ feet; this channel is being widened. Steamers from Washington and Baltimore land at Leonardtown.

St. Clement's Bay is an estuary about 5½ miles long, making in to the northward, just above Breton's Bay. It has some trade in wood, grain, and oysters, and the Potomac River steamers make a landing at **Stone's Wharf**. There is 16 feet of water in the channel for a distance of 2 miles above the entrance; above this it shoals gradually, and 9 feet can be taken up nearly to the head of the bay. The most prominent dangers off the entrance are marked by buoys. **Blakistone Island Light-house** is a prominent guide for entering. Strangers entering the bay should take a pilot or be guided by Coast and Geodetic Survey chart 389. Dukehart's Channel, leading to the westward and northward of Blakistone Island, is marked by several buoys, but should not be used by a stranger.

Wicomico River empties into the Potomac from a northerly direction, about 4½ miles above Blakistone Island Light-house. **Chaptico Bay** and **Creek** empty into this river from the eastward, about 6 miles above its mouth. The channel for a distance of 4 miles above the entrance of the river has a least depth of 4 fathoms, but is quite narrow in places; above this there are numerous shoal spots, which make navigation difficult for vessels of over 5 feet draught. Cob Point Bar makes out from the western point of entrance, and is marked at its southeastern end by **Cob Point Bar Light-house** (see table, page 18) and a buoy (spar, red and black horizontal stripes). Two other buoys mark prominent shoals in the river above this buoy. On the eastern shore of the river and about 3 miles above its mouth is the landing of **Bushwood**, (**Plowdens**).

Mattox Creek is a shallow unimportant estuary in the south shore, about 10 miles above Blakistone Island Light-house. It has a narrow, crooked channel with 6 to 11 feet of water, and should not be entered by a stranger without a pilot.

Upper Machodoc Creek empties into the western side of the river about 2 miles below Lower Cedar Point Light-house. It is of no commercial importance and should not be entered by a stranger.

Port Tobacco River makes in to the northward about 6 miles above Lower Cedar Point Light-house. It extends 4 miles to the town of **Port Tobacco**, but is shoal and should not be entered by a stranger. The large bight at its mouth is also full of shoals, which are marked by a buoy and a beacon on their southern edge.

Nanjemoy Creek empties into the northern side about 1½ miles above Upper Cedar Point Light-house. It is of little importance; the channel is narrow and shallow and only fit for small craft.

Potomac Creek is an estuary emptying into the Potomac from the westward, about 10 miles above Upper Cedar Point Light-house. It is of little importance and only entered by small vessels engaged in the local trade.

Aquia Creek empties into the Potomac from the northwestward, about 13 miles above Upper Cedar Point Light-house. The creek is shallow and has been improved, under the supervision of U. S. Engineers, by dredging a channel, about 5 feet deep and 40 to 80 feet wide through its shoalest part. About 3 miles above its mouth the creek is crossed by a railroad drawbridge.

Chapowamsie Creek is a narrow and unimportant stream about 7 miles above Aquia Creek, on the same side of the river.

Quantico Creek is a shallow estuary of the Potomac nearly 9 miles above Aquia Creek. It has a narrow crooked channel with 7 feet water, leading into the entrance and a short distance above the railroad-bridge which crosses from its northern point of entrance. The railroad-bridge is a prominent feature when off the entrance of the creek.

Chicomuxen Creek is shallow and empties into the Potomac opposite Quantico Creek; it is of little importance. There is a landing on the southern shore, inside the entrance.

Rowell's Creek on the west side, and **Mattawoman Creek** on the east side, about 3 miles above Quantico Creek, are shallow and of no importance. Extensive shoals make off the entrance to Mattawoman Creek.

Neapsico (Neabsco) Creek, on the west side of the river just above Rowell's Creek, is shallow and of no importance to strangers. A little cordwood and some piles and railroad-ties are shipped in small vessels.

OCCOQUAN CREEK

empties into the Potomac from a northwesterly direction, about 14 miles above Aquia Creek; its northern point of entrance is **High Point**. The town of **Occoquan**, at the head of navigation, about 7 miles above High Point, is reached through a dredged channel which was from 50 to 100 feet wide and 5 feet deep in 1879. A railroad-bridge crosses the creek about 2 miles below the town of Occoquan. **Belmont Bay** is a large shallow bight inside the entrance of the creek, on its eastern side.

Gunston Cove makes into the western shore of the river about 6 miles above High Point. At its head **Accotink Bay** makes in to the northward and **Pohick Bay** to the westward. These waters are shallow and of no commercial importance.

Doag Creek, about 2 miles above Gunston Cove and opposite Marshall Point, is shallow and of no importance.

Piscataway Creek is on the eastern shore of the river, just below Fort Washington and 3 miles above Marshall Point (Marshall Hall). It is shallow and of no commercial importance.

Broad Creek is on the eastern shore, about 3 miles below the city of Alexandria; it is shallow and of no importance.

The city of **Alexandria** is on the west bank of the river, about 96 miles above the entrance and 4 miles below the city of Washington. It has some trade in coal, lumber, and ice, carried principally in the larger class of coasting vessels. The deepest draught taken to Alexandria is 18 to 20 feet; this draught can be taken alongside the principal wharves. There are two marine railways and excellent facilities for repairs to hulls of vessels (see "Repairs" following). Opposite Alexandria, on the east bank of the river, and extending out from Marbury Point, is the long pier of the B. & O. R. R.

Washington, the capital of the United States, is on the east bank of the river, about 100 miles above the entrance. The city has considerable trade in coal, lumber, and ice, brought in the larger class of coasting vessels, and is also a market for farm produce, oysters, and fish, carried in vessels engaged in the bay trade. Several lines of steamers make regular trips between Washington and points in Chesapeake Bay and its tributaries. A draught of

22 feet has been taken up to the city under the most favorable circumstances, but 18 to 20 feet is the heaviest draught that can ordinarily be taken up at high water. Sailing-vessels, when bound to Washington, should take a tow-boat at Alexandria on account of the channel, which is narrow and is being improved by dredging under the supervision of the U. S. Engineers. The channel abreast the wharves is about 350 feet wide and 20 feet deep, but this depth is liable to change on account of freshets. The Harbor Master has supervision of the vessels along the water front of the city, and authority to remove such as are an obstruction to navigation.

The **U. S. Navy Yard** is on the **Eastern Branch**, which makes to the northeastward from the Potomac at the U. S. Arsenal and was the southeastern boundary of the city of Washington. A narrow and crooked dredged channel, marked by buoys, leads through the extensive flats of the branch to the U. S. Navy Yard; this channel has a depth of about 16 feet, but is too narrow for a vessel to work in unless assisted by steam. A bridge crosses the Eastern Branch just above the Navy Yard. The **U. S. Gun Foundry** for the manufacture of heavy naval ordnance is situated at the Navy Yard.

Georgetown, now a part of Washington, is just above, and separated from the latter by Rock Creek, a narrow, shallow stream of no importance. Georgetown has some trade in coal, lumber, and ice, brought in the larger class of coasting vessels, and occasionally a foreign vessel brings a cargo. The deepest draught taken to the wharves is 16 to 20 feet through a dredged channel about 500 feet wide, which leads through the long bridge to the wharves. The depth in this channel is liable to changes on account of freshets. Vessels bound to Georgetown should take a tow-boat at Alexandria.

Aids to Navigation.—The light-houses in Potomac River are not sufficiently numerous to make the navigation of the river safe for a stranger at night; they are described in the table on page 18. The buoyage of the river is under the system adopted by the Light-house Board for U. S. waters; see page V.

The Channel of the river is good for a depth of 18 to 20 feet; this depth will be found between the lumps when crossing Kettle Bottom Shoals. A depth of 16 to 17 feet will generally be found in the channel abreast of the entrance to Mattawoman Creek, and a short distance above, on what is known as Mattawoman Shoal; some local knowledge is necessary to carry the best water (19 to 20 feet) in this part of the river. Excepting the western shore of the river between Maryland Point and the entrance to Chapowamsie Creek, the water generally shoals abruptly on the edge of the channel, and a stranger should not attempt to beat while in the river above Blakistone Island Light-house. In many places above Indian Head the shoals are clearly defined at low water by the grass growing on them, or by the color of the water. The buoys are reliable guides to keep in the channel and are placed where most needed. Above Alexandria the channel is narrow and shoals abruptly on both sides; off the Eastern Branch it is being improved by dredging. The dredged channels to Georgetown and to the U. S. Navy Yard have shoaled somewhat since the freshet of June, 1889.

Anchorages.—Vessels bound up or down the river anchor anywhere in the channel where the bottom is soft. Those entering the river for shelter, if of heavy draught, stand into the mouth of St. Mary's River, where there is good anchorage in 4 to 5 fathoms water, soft bottom. Vessels engaged in the bay trade sometimes anchor for shelter in Coan River. An anchorage for the night, frequently used by vessels bound up or down Chesapeake Bay, is Cornfield Harbor, just to the westward of Point Lookout Light-house. This anchorage is exposed to southerly, southeasterly, and westerly winds, but is sheltered from northerly and northeasterly winds. The larger class of vessels bound up the river anchor anywhere in the channel where suitable depth and bottom are found.

Pilots.—Pilotage is not compulsory for vessels bound up the Potomac. Vessels desiring a pilot can get one from St. George's Island by making a signal when in the mouth of the river. If a tow-boat is taken a pilot is not needed, as the captain of the tug is a licensed pilot. Vessels taking a Maryland pilot in the entrance of Chesapeake Bay are taken up the river by that pilot or turned over to a river pilot at the mouth of the river; in either case the pilot's rate is the same as for the port of Baltimore. (See Pilot Laws in Appendix I.)

Tow-boats can always be had at Alexandria and Washington. If a vessel bound up the river is expected to arrive, a tug is generally sent down the river to meet her at the entrance. The larger class of vessels bound to Alexandria, Washington, or Georgetown all take a tow-boat to avoid the delays caused by adverse winds and tides.

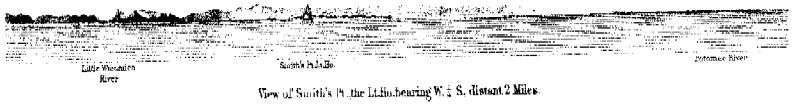
Supplies.—Coal, water, provisions, and ship chandler's stores can be obtained at Alexandria, Washington, and Georgetown.

Repairs.—There are two marine railways at Alexandria and good facilities for repairs to hulls of vessels. The largest railway has a cradle 225 feet long and 30 feet wide, and a capacity of hauling out vessels of 800 tons register. The other railway is about 150 feet long, with a capacity of hauling out vessels of 100 tons register. Ordinary repairs to machinery of steamers can be made at Alexandria and Washington.

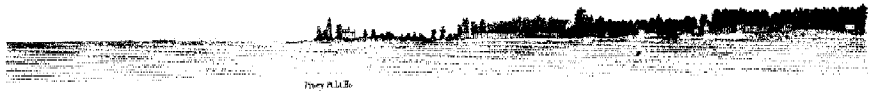
Freshets occur at irregular intervals, but as a rule do not interfere with the navigation of the river below Alexandria unless accompanied by floating ice. At Washington, during the freshet of June 2, 1889 (the highest recorded), the river rose 13.26 feet at the foot of 17th street, and the deposit in the dredged channels decreased the depth from 20 feet to 14 feet in some places.

Ice.—During severe winters the tributaries of the Potomac are closed by ice and the river is frozen over to Cedar Point; the upper part of the river is then closed to navigation. During ordinary winters the tow-boats and steamers

View of Point Lookout, the lt.Ho.bearing W.SW.distant 3¼ Miles.



View of Smith's Pt. the Lt.Ho.bearing W. ½ S. distant 2 Miles.



Piney Pt.from the Southward, the Lt.Ho.bearing NW. distant 1½ Miles.

View off St.Mary's River, Piney Pt.Lt.Ho.bearing NW.½ W.distant 5 Miles.

plying on the river keep a channel open, but sailing vessels usually require the assistance of steam when bound to Alexandria, Washington, or Georgetown.

TIDES—POTOMAC RIVER.†

GENERAL TABLE.

It is high water at Point Lookout 4 hours 10 minutes after high water at Old Point Comfort. The corrected establishment for Old Point Comfort is 8 hours 46 minutes.

Locality.	Time of H. W. after time of H. W. at Point Lookout.	Mean Rise and Fall.			Mean Duration of—			Rise of highest tide observed.	Distance of station above Point Lookout.
		Mean tides.	Spring tides.	Neap tides.	Rise.	Fall.	Stand.		
	h. m.	Feet.	Feet.	Feet.	h. m.	h. m.	h. m.	Feet.	Miles.
Point Lookout	----------	1.4	1.7	1.1	6 03	6 22	0 35	2.6	--------
Yeocomico River entrance	0 30	1.4	1.7	1.1	6 02	6 23	33	2.6	9
Blakistone Island	54	1.8	2.2	1.4	6 16	6 09	34	2.6	24
Lower Cedar Point	1 42	1.6	1.9	1.3	5 28	6 57	32	2.1	40
Nanjemoy Creek	3 19	1.3	1.6	1.0	5 51	6 34	34	1.8	48
Mattawoman Creek	5 48	1.3	1.6	1.0	6 32	5 53	35	1.8	70
Fort Washington	6 43	2.4	2.9	1.9	5 40	6 45	33	3.1	89
Alexandria	7 00	2.6	3.1	2.1	5 38	6 47	34	3.8	97
Washington, Long Bridge	7 08	2.8	3.4	2.2	5 37	6 48	33	4.0	103

Tidal Currents.—The velocity of the tidal currents in the Potomac is irregular, and is influenced by the force and direction of the wind; the set is generally in the direction of the channel. During freshets there is little or no flood current.

SAILING DIRECTIONS—POTOMAC RIVER.

The following directions are good for the daytime when the buoys can be seen, and at night as far up as Piney Point Light-house. As the river channel is crooked, and in many places too narrow for any but small vessels to work in, sailing vessels bound above Blakistone Island are advised to take a tow-boat.

1. ***Approaching and entering.—From the Southward.***—Having followed the directions in Sections 1, 2, and 3, "Sailing Directions, Chesapeake Bay," round Smith's Point Light-house, giving it a berth of 1½ miles, and when it bears **SW.**, distant 1½ miles, steer **NW. ½ W. Westerly** for 21 miles. This course made good leads 2 miles south of Point Lookout Light-house, about 1 mile south of St. George's Island, and to a point about 1 mile south of Piney Point Light-house. Then follow the directions in Section 2.

If beating.—Do not approach Point Lookout Light-house from the southward closer than 1 mile until it bears to the eastward of **NE.** by **N.**, and do not bring Smith's Point Light-house to bear to the eastward of **SE. ½ E.** *At night,* having passed to the northward of Smith's Point Light-house and entered its white rays, keep in them, going about when, in standing to the southward, that light begins to show red (see table of lights, page 18). A good general rule for vessels to follow is, when beating into the river, to give the south shore between Smith's Point and the western point of Yeocomico River (Lynch's Point) a berth of 1¼ miles, keeping out of the entrances of the tributaries; give the north shore between Point Lookout and St. George's Island a berth of 1 mile, keeping out of the mouth of St. Mary's River and clear of St. George's Island Bar.

Having entered the river as directed above:

I. ***If desiring to anchor in Cornfield Harbor.***—When, on the **NW. ½ W. Westerly** course Point Lookout Light-house bears **N. ¾ E.**, steer **N. ¾ W.**, and anchor about ¾ mile to the westward of the light-house, ½ to ¾ mile from the beach, in 18 to 22 feet of water.

II. ***If bound into St. Mary's River for shelter.***—Follow the directions under heading "St. Mary's River."

III. ***If bound into Coan River.***—Bring Point Lookout Light-house to bear **E NE. ¾ E.** and steer **W SW. ¾ W.**, standing in fair between the two black buoys off the entrance. (Two red buoys will be seen off the entrance farther in shore.) When well inside the two black buoys (spar, No. 3, and can, No. 5), head for the red spar-buoy (No. 2) and leave it close on the starboard hand; now

† The rise and fall of the tides in Potomac River, as in Chesapeake Bay and other of its tributaries, is much influenced by the force and direction of the wind.

steer for the red nun-buoy (No. 4) and round it leaving it close-to on the starboard hand; then steer about **W.** ½ **S.**, and anchor to the southwestward and close to Travis' Point, in 10 to 13 feet water. If bound farther up the river take a pilot.

IV. ***If bound into Yeocomico River.***—Bring Point Lookout Light-house to bear **E.** and steer **W.** keeping the bearing, and taking care not to be set on the shoals to the eastward of the entrance. This course made good will lead up to *Lynch's Point Shoal buoy* (spar, black, No. 7); leave this buoy 100 yards on the starboard hand and steer **W.** by **N.** Follow a mid-river course, and anchor to the westward of the black buoy off Barn Point, in 17 feet water.

If bound into any of the branches of the Yeocomico River take a pilot.

V. ***If bound into Smith's Creek.***—When to the westward of Cornfield Point stand along the north shore, giving it a berth of about 1 mile, until within 1½ miles of Kitt's point and the buoys at the entrance to Smith's Creek are made and bear about **N.** Take a pilot, as some local knowledge is necessary to keep in the channel, which is narrow and shoals abruptly on both sides.

If a pilot for Potomac River and its tributaries is desired, and one is not found at the mouth of the river, stand in on the **NW.** ½ **W. Westerly** course, with signal set, until up to St. George's Island, where a pilot can always be found.

Remarks.—On the **NW.** ½ **W. Westerly** course, Point Lookout Light-house will be made broad off the starboard bow; Little Wicomico River and **Hock's, Cubbett's, Hull's,** and **Presley's** creeks, on the south shore and of no importance, are passed. Before reaching St. George's Island, Smith's Creek, St. Mary's River, and the entrance to St. George's River, all on the north shore, and Coan and Yeocomico rivers, on the south shore, will be opened out. Piney Point Light-house will be made well on the starboard bow, and **Ragged Point** (low, sandy, covered with trees except at its end) will be a little on the port bow. There is a landing and large white house on the eastern side of this point.

Dangers.—**Smith's Point Shoal** extends in an easterly direction about 2¼ miles from Smith's Point. It has 6 to 12 feet of water over it, and its eastern edge is marked by Smith's Point Light-house (see table, page 18) and two buoys (can, black, Nos. 11 and 1). Smith's Point Shoal lower buoy (can, black, No. 11) is placed off the southeastern end of the shoal, a little over 1 mile **S SE.** from the light-house. Smith's Point Flats upper buoy (can, black, No. 1) is placed off the northeastern point of the shoal, ½ mile **N NW.** from the light-house.

Point Lookout Shoal makes out nearly ½ mile to the eastward and nearly 1 mile to the southward from Point Lookout; 13 feet of water is found on the shoal about ½ mile to the southward of the light-house. Its southern end is marked by a buoy (nun, red, No. 2) which bears **S.** ¾ **W.** from the light-house.

The Shoals along the south shore can be avoided by giving that shore a berth of 1⅛ miles.

Coan River South Shoal, on the eastern side of the entrance to Coan River, extends 1⅛ miles from the shore and is marked by a buoy (spar, black, No. 3). It has from 4 to 16 feet over it.

Coan River North Shoal, with 4 to 14 feet of water over it, extends 1¼ miles out from the western point of entrance to Coan River, and is marked by a buoy (can, black, No. 5).

St. George's Island Bar, making out 1¼ miles to the southeastward from the southeastern end of St. George's Island, has from 3 to 17 feet of water over it, and is marked at its southeastern point by a buoy (spar, red and black horizontal stripes). This buoy is left on the port hand by vessels entering St. Mary's River.

The Shoals along the north shore between Cornfield Point and St. Mary's River entrance will be avoided by giving that shore a berth of 1 mile.

The western side of St. George's Island should not be approached closer than ¾ mile on account of shoals making out from it.

Lynch's Point Shoal makes out 1½ miles **SE.** by **E.** ½ **E.** from Lynch's Point and has from 2 to 6 feet of water over it for about one-half this distance. Its eastern point is marked by a buoy (spar, black, No. 7), which is also the guide for the entrance to Yeocomico River.

The south shore above Lynch's Point, and until Piney Point bears **NE.**, can be approached to within ⅝ mile, but above this the shore should receive a berth of at least 1½ miles.

1 A. ***Approaching and entering.—From the Northward.***—Standing down Chesapeake Bay, as soon as Point Lookout Light-house is made shape a course so as to pass at least 1 mile to the eastward of it. Bring the light to bear **N.** ¾ **E.**, distant 1½ miles, and steer **NW.** by **W.** This course made good for 12 miles will lead to a point 1¼ miles to the southwestward of Piney Point Light-house. Then follow the directions in Section 2.

Directions for beating are given under Section 1. For Remarks and Dangers see also Section 1, preceding.

Directions for entering Cornfield Harbor, Coan River, Yeocomico River, and Smith's Creek will be found in Section 1, paragraphs I, III, IV, and V. Directions for St. Mary's River will be found under a separate heading following Potomac River.

2. ***From Piney Point to Lower Cedar Point Light-house.***—When Piney Point Light-house bears **NE.**, distant about 1 mile, steer **NW.** ⅞ **N.** until Ragged Point bears **SW.** Piney Point Light-house will then bear about **SE.** by **E.**, and the black can-buoy No. 9, marking Ragged Point

View of Breton and St Clement's Bays, from off Kingsepsico Pt., Blakistone's Island Lt. bearing N.W. by W. ½ W, distant 3 Miles.

Bluff and King George's Points from off White Pt., Bluff Pt. bearing W. N.W. ¼ W., distant 2 Miles.

View, looking up from off Swan Pt., Lower Cedar Pt. Lt. Ho. bearing N. N.W. ¼ W., distant 5¼ Miles, Swan Pt. N.N.E. ½ E. dist. 1¾ Miles.

View from off Pope's Creek Landing (looking up). Mathias Pt. bearing N.W. by W. ½ W, distant 2¼ Miles.

Spit will be about $\frac{3}{4}$ mile to the southwestward. Now shape the course **W NW.** $\frac{1}{2}$ **W.** for 8 miles; Blakistone Island Light-house will be on the starboard bow. Pass about $\frac{3}{4}$ mile south of this light-house, and when it bears **NE.**, distant $\frac{3}{4}$ mile, steer **NW.** by **W.** $\frac{1}{2}$ **W.** This course continued $4\frac{1}{8}$ miles leads about $1\frac{1}{8}$ miles **S SW.** of Cob Point Bar Light-house, and to the first mid-channel buoy (spar, white and black perpendicular stripes) marking the eastern end of the channel over Kettle Bottom Shoals, and continued for about 3 miles farther leads past the second, third, and to the fourth mid-channel buoy. All the mid-channel buoys are spar-buoys with the exception of the tenth, which is a can of the first class; they are all painted black and white in perpendicular stripes. From the fourth mid-channel buoy to the sixth the course is about **NW.** by **W.** $\frac{1}{4}$ **W.**, and from the sixth mid-channel buoy to the tenth the course is **NW.** $\frac{3}{4}$ **W.** From the tenth buoy (first class can), steer for Lower Cedar Point Light-house, course about **N.** by **W.** $\frac{1}{2}$ **W.**, leaving Lower Cedar Point beacon about $\frac{1}{4}$ mile on the starboard hand. When within $\frac{3}{8}$ mile of the light-house, bear to the northward so as to leave it about 400 yards on the port hand, then follow the directions in Section 3.

Remarks.—The **NW.** $\frac{3}{8}$ **N.** course from Piney Point leads nearly in mid-stream and well clear of Ragged Point Spit. On the **W NW.** $\frac{1}{2}$ **W.** course, with Blakistone Island light-house on the starboard bow, Lower Machodoc River and Nomini Bay will be opened out on the south shore, and Breton's and St. Clement's bays will be opened on the north shore just to the eastward of Blakistone Island.

On the **NW.** by **W.** $\frac{1}{2}$ **W.** course, after passing Blakistone Island Light-house, the Nomini Cliffs (high, bare, in places showing steep faces of reddish sand) will be seen on the south shore. On the north shore St. Catherine's Sound and Wicomico River will be opened out. **Cob Point Bar Light-house** will be on the starboard bow at the western side of the entrance to Wycomico River. A sharp lookout should be kept for the first mid-channel buoy, so as to get a fair lead for the buoyed channel over Kettle Bottom Shoals; these buoys should be followed, leaving them close-to on either hand. When abreast the fourth mid-channel buoy the mouth of Mattox Creek, on the south shore, will be opened. **Colonial Beach**, a summer resort and landing, will be seen about 2 miles above the mouth of Mattox Creek. When past the tenth mid-channel buoy (first-class can, white and black perpendicular stripes) and steering for Lower Cedar Point Light-house, the beacon (iron cylinder, painted red, with white ball above) marking the end of the shoal making out from Lower Cedar Point will be made on the starboard bow, and the buoys marking the dredged channel to the wharf at the point will be seen close in to the southward of Lower Cedar Point. Rosier's Creek and Upper Machodoc Creek will be opened out on the south shore.

Dangers.—**Ragged Point Spit** makes out to the northeastward from Ragged Point nearly $\frac{3}{4}$ mile. It has 1 to 7 feet of water over it, and is marked at its northeastern end by a buoy (can, black, No. 9). The shore for a distance of 3 miles to the eastward of Ragged Point should receive a berth of at least $1\frac{1}{2}$ miles, on account of shoals that have less than 18 feet of water over them.

Shoal Spots with 17 to 18 feet of water over them lie about $1\frac{1}{2}$ miles off the northern shore, about 5 miles above Piney Point Light-house. Above these spots the shore may be approached to within $\frac{5}{8}$ mile up to the entrance to Breton's Bay.

Heron Island Shoal makes out $\frac{3}{4}$ mile to the eastward from **Heron Island**, the small low island east of Blakistone Island. The shoal is marked at its eastern end by a buoy (spar, red and black horizontal stripes), which is also a guide for vessels entering Breton's and St. Clement's bays from the eastward.

Shoals along the south shore above Ragged Point can be avoided by keeping out of the bights and giving the shore a berth of $\frac{5}{8}$ mile. This rule should be followed until up to the lower end of Kettle Bottom Shoals.

Cob Point Bar, making out to the southeastward from **Cob Point**, the western point of entrance to the Wicomico River, is nearly bare in places at low water, and is marked by a light-house (see table of lights, page 18) and buoy (spar, red and black horizontal stripes) placed on its southeastern point.

Kettle Bottom Shoals occupy a stretch of the river about 10 miles long, between the mouth of the Wicomico River and Lower Cedar Point. These shoals comprise numerous shifting lumps, having 10 to 18 feet of water over them. A channel has been buoyed which leads nearly in a straight line between the lumps, through the shortest part of the shoal, in a general **NW.** by **W.** $\frac{1}{4}$ **W.** direction. The buoys are ten in number, nine spar-buoys and one can-buoy; they are all painted white and black in perpendicular stripes, and placed close enough to one another to be readily picked up in the daytime. When passing over Kettle Bottom Shoals the buoys should be closely followed.

Upper Machodoc Flats make out $1\frac{1}{2}$ miles from the mouth of Upper Mochodoc Creek, occupying the bight in the west shore of the river between **Bluff Point**, the eastern point of entrance to Rosier's Creek, and lower Cedar Point light-house. These flats have 6 to 11 feet of water over them, and are marked at their eastern edge by a buoy (spar, black, No. 11) placed $1\frac{3}{4}$ miles **S.** of Lower Cedar Point Light-house.

Lower Cedar Point Shoal is marked at its lower end by a beacon (red iron cylinder with white ball above.) This shoal has 2 to 8 feet of water over it, and near the point a dredged channel marked by three buoys leads from the westward across the shoal to the landing on the eastern side of the point.

Lower Cedar Point Light-house is on the eastern edge of the shoals which extend along the west shore from Bluff Point to Mathias Point, a distance of about 9 miles; a part of this shoal is known as **Yates' Bar**. The light-house bears **W.** from Lower Cedar Point, distant about $\frac{3}{4}$ mile. The red rays of this light cover Lower Cedar Point Shoal (see table, page 18).

3. ***From Lower Cedar Point Light-house to the mouth of Aquia Creek.***—Passing about 400 yards to the eastward of Lower Cedar Point Light-house, steer about **N.** $\frac{3}{8}$ **W.** Persimmon Point Shoal beacon will be on the port bow and should be left on the port hand. When

this beacon is ¼ mile distant on the port quarter, change the course to **N NW. ¾ W.** Pope's Creek Flats buoy will be on the starboard bow and should be left about ¼ mile on the starboard hand when passing. When it bears a little abaft the starboard beam change the course to about **W NW.** so as to pass midway between Mathias Point Shoal Light-house and Port Tobacco River Flats beacon.

When on a line and midway between the light-house and beacon, steer about **W SW. ½ W.** Upper Cedar Point Light-house will be on the starboard bow and should be left about 600 yards on the starboard hand. After passing between Upper Cedar Point Light-house and Dade's Shoal Lower buoy, two black spar-buoys will be passed and left on the port hand while standing on the **W SW. ½ W.** course. When abreast of the second black spar-buoy, Mid-channel Lump buoy, and it is about 300 yards distant, shape the course about **SW.** by **W. ¼ W.** Matomkin Point beacon will be made a little on the port bow, and should be left 200 yards on the port hand when passing. When abreast of this beacon red spar-buoy No. 10 will be made ahead; this buoy should be left on the starboard hand, as should also red nun-buoy No. 12, which will be seen nearly ahead.

Passing red nun-buoy No. 12, steer **W. ⅛ S.**, heading for Marlborough Point, the northern point of entrance to Potomac Creek, and leaving the red and black horizontal striped buoys on the port hand. When up to Maryland Point Shoal buoy (nun, red and black horizontal stripes) leave it 400 yards on the port hand and steer **NW.** by **W. ¾ W.** A black spar-buoy (No. 19) will be made ahead; when nearly up to this buoy leave it on the port hand and steer **N NW. ⅝ W.**, heading so as to pass at least 150 yards to the eastward of black spar-buoy No. 21. The entrance to Aquia Creek is to the westward of this buoy. Then follow the directions in Section 4.

Remarks.—Standing up on the **N. ⅛ W.** course, after passing Lower Cedar Point, Port Tobacco River will be open a little on the port bow. **Mathias Point Shoal Light-house** (see table, page 18) will be opened broad off the port bow behind **Persimmon Point**, the point on the west shore 2¼ miles above Lower Cedar Point Light-house. The large bight at the entrance of Port Tobacco River and north of Mathias Point is full of shoals. On the **W SW. ½ W.** course, after having passed Mathias Point Shoal Light-house, Upper Cedar Point Light-house (see table, page 18) will be on the starboard bow, and when it is passed Nanjemoy Creek will be opened in the north shore.

On the **SW.** by **W ¼ W.** course, after passing the entrance of Nanjemoy Creek, the buoys should be followed, leaving them on the proper side; the red and black horizontal striped buoys off **Maryland Point**, the point on the north shore, about 6½ miles above Upper Cedar Point Light-house, which shows as a well-marked bluff with trees when seen from down the river, should be left on the port hand. **Marlborough Point**, the northern point of entrance to Potomac Creek, is low, with bushy trees; the southern point of entrance is abrupt and heavily wooded. On the **NW.** by **W. ¾ W.** course the shore above Maryland Point should be given a berth of ⅛ mile until up to black spar-buoy No. 19. Aquia Creek will be ahead on this course and Potomac Creek will be opened broad off the port bow. Above black spar-buoy No. 19 the channel leads along the eastern shore to black spar-buoy No. 21, off the mouth of Aquia Creek. The railroad depot on the southern point of entrance to Aquia Creek will be a conspicuous feature.

Dangers.—**Pasquahansa Shoal** makes out from the eastern shore above Lower Cedar Point. Its western edge is marked by a buoy (spar, red, No. 6).

Persimmon Point Shoal makes out to the eastward from the point and is marked by a beacon (black and white screw-pile structure, with ball above) placed on the eastern side of the shoal.

Pope's Creek Flats is the name applied to the eastern part of the flats lying off the mouth of Port Tobacco River and off Pope's Creek Landing. The edge of the flats are marked by a buoy (spar, red, No. 8).

Shoals make out ⅜ mile from the shore, about midway between Persimmon Point and Mathias Point.

Port Tobacco River Flats lie in the bight off the mouth of Port Tobacco River and have a depth of 3 to 9 feet over them; their southern edge is marked by a beacon (red and white screw-pile structure, with white cage and red ball above). At night the red rays of Upper Cedar Point Light-house cover these flats to the westward of the beacon.

Mathias Point Shoal makes out to the northward from **Mathias Point** and is marked by **Mathias Point Shoal Light-house** (see table, page 18) near its northern end. This shoal has a depth of 3 feet over it.

Upper Cedar Point Light-house (see table, page 18) is near the eastern end of shoals which make out fr Upper Cedar Point and extend to the mouth of Nanjemoy Creek.

Dade's Shoal has spots with only three feet of water over them; the shoal is 1⅝ miles long in a general **E NE.** and **W SW.** direction, and lies to the southward and southwestward of Upper Cedar Point Light-house. It is marked by two buoys (spar, black, No. 13) placed on its northern side at the lower end of the shoal, and (spar, black, No. 15) placed near the upper end. There is a narrow channel south of this shoal; with this exception, the bight between **Mathias** Point and **Matomkin Point** (about 5 miles above **Mathias Point**) is full of shoals.

Mid-channel Lump has only 3½ feet of water over it, and lies south of the entrance to Nanjemoy Creek. It is marked by a buoy (spar, black, No. 17) placed off its northern end. About ⅝ mile **SW.** by **W. ¼ W.** from this lump is an unmarked spot with 5½ feet over it.

Matomkin Point Middle Ground lies to the northward of Matomkin Point, and is marked by a beacon (black and white screw-pile structure, with ball above) placed on the north side of its shoalest part. This middle ground is 1⅛ miles long in a general **E NE.** and **W SW.** direction, and its greatest breadth is about ⅝ mile; it has depths of 2 to 14 feet over it, with a deep channel on each side. A stranger should not attempt the channel between the Middle Ground and Matomkin Point on account of several unmarked shoal spots to the northeastward of the point.

View looking up the River, Maryland Point bearing W.¼ N, distant 1¾ Miles.

View from off Potomac Creek (looking up), Smith's Pt. bearing N.¼ W, distant 2 Miles, and Brent's Pt. NW by W.¼ W, distant 2¾ Miles

Jenifer's Flats make out nearly ½ mile from the northern shore, just below Maryland Point. The edge of these flats is marked by two buoys—the lower (spar, red, No. 10); the upper (nun, red, No. 12).

Several shoal spots with depths of 9½ to 17 feet over them lie off the southern shore between the two Jenifer's Flats buoys. To avoid these spots give the southern shore a berth of ¾ mile.

Ten-Foot Lump lies nearly in mid-stream southeast from Maryland Point. It is nearly ½ mile long in an **E.** and **W.** direction, and is marked by a buoy (can, red and black horizontal stripes) placed on the middle of the shoal, which has 10½ to 12½ feet of water over it. This shoal is usually left on the port hand coming up the river.

Maryland Point Shoal is about ½ mile long in a general **NW.** and **SE.** direction, and lies in mid-stream **SW.** from Maryland Point. The shoal has 14½ to 18 feet of water over it, and is marked by a buoy (nun, red and black horizontal stripes) placed on the middle of the shoal. There is good water on both sides of this shoal, but it is usually left on the port hand coming up the river.

Potomac Creek Flats is the name given to the lower part of the flats which make out from the western shore from abreast Maryland Point to the mouth of Chapowamsie Creek, leaving only a comparatively narrow deep-water channel along the eastern shore of the river. These flats have depths varying from 9½ to 16 feet, and their eastern edge is marked by four buoys: Potomac Creek Flats buoy (spar, black, No. 19) off the entrance to Potomac Creek; Aquia Creek Flats buoy (spar, black, No. 21) off the entrance to Aquia Creek; Smith's Point buoy (spar, black, No. 21½) off Smith's Point; Clifton Point Flats buoy (spar, black, No. 23) off Clifton Point—all left on the port hand standing up the river.

4. ***From Aquia Creek to Marshall Point (Marshall Hall).***—Leaving black spar-buoy No. 21, off the entrance to Aquia Creek, about 150 yards on the port hand, steer **N. ¼ W.**, following the eastern shore and the buoys. Passing Clifton Point Flats buoy (No. 23), continue the **N. ¼ W.** course until in mid-stream and the northern end of the island in the mouth of Chapowamsie Creek (low, with several summer cottages showing among the trees) bears **W NW. ½ W.** Now steer about **N NE. ½ E.**, keeping in mid-stream, and when the northern point at entrance to Chicomuxen Creek (low, with straggling bushes and several houses, the latter some distance back from the end of the point) bears **SE. by E. ¼ E.**, shape the course **NE. ½ E.**, heading for High Point Flats lower buoy. Leave this buoy on the port hand and steer **NE. ¾ N.** for High Point Flats upper buoy. When up to the latter buoy, leave it on the port hand and shape the course about **NE. ½ E.**; follow the eastern shore, giving it a berth of 300 yards.

Pass the landing at Glymont and steer **NE. ¾ N.**; bear over, favoring the western shore when Hallowing Point is approached. When Hallowing Point bears **W. ½ N.** steer **N. ¾ W.**, heading for the high bluff on White Stone Point, and when up to the point, follow the western shore of the river, giving it a berth of about 350 yards until about ½ mile above the point. Then bring the White House (old weather-beaten house with a small red dome showing among the trees) to bear **W SW.** over the stern and steer **E NE.**, heading so as to pass about 400 yards from the end of the landing at Marshall Point (Marshall Hall). Then follow the directions in Section 5.

Remarks.—On the **N. ¼ W.** course, after passing Aquia Creek Flats buoy (spar, black, No. 21), **Smith's Point** (**Clifton Beach**), a summer resort and landing, and **Douglass** and **Liverpool** points will be passed on the eastern shore in the order named. **Mallow's Creek** will be passed just to the northward of Liverpool Point. When the course is changed to **N NE. ½ E.**, Chapowamsie Creek will be on the port beam, and standing up the river on this course Quantico Creek will be left on the port hand. Just below Quantico Creek is a landing (**Quantico**) and several large houses which show conspicuously when passing. **Cockpit Point**, on the west shore, about 2¼ miles above Quantico Creek, is low with straggling trees and bushes, and shows to the right of **Possum Nose**, high bare-faced bluffs, when standing up the river. In the eastern shore nearly opposite Quantico Creek is Chicomuxen Creek.

High Point Flats lower buoy lies between Powell's and Mattawoman creeks, the former making into the west shore and the latter into the east shore just above Cockpit Point and **Stump Neck**. The shoal spots lying in the channel off the entrance to Mattawoman Creek are liable to pick up a vessel of over 16 feet draught. On the northern side of Powell's Creek entrance is **Freestone Point** (high, covered with trees, and showing abrupt from the southward); this point is the southern point of entrance to a large shallow bight forming the entrance to Neapsico (Neabsco) Creek and Occoquan Creek—the latter entering the bight from the northward and the former from the westward. **Indian Head**, on the east shore, is a remarkable high, almost perpendicular sand bluff when seen from the southward; it lies about **E SE.** from High Point, the northern point of entrance to Occoquan Creek.

About 1½ miles above Indian Head, on the eastern shore, is **Glymont**, a summer resort and the landing for steamers. **Cranney Island** is a small island with a few low trees, north of Glymont; it is on the western side of the channel and surrounded by flats. On the west shore, 1½ miles above Glymont, is **Hallowing Point**. Pamunky Creek is on the eastern shore opposite Hollowing Point. From abreast Hallowing Point the **N. ¾ W.** course leads direct for **White Stone Point** (high, wooded, with white and yellow precipitous faces covered in part with scrub). Between Hallowing Point and White Stone Point, Gunston Cove makes into the western shore. This is a large, shallow cove, with two arms at its head, **Accotink Bay** and **Pohick Bay**. About 1⅝ miles above White Stone Point, on the eastern shore, is **Marshall Point (Marshall Hall)** and steamboat landing, and opposite Marshall Point, on the west shore, is the broad and shallow entrance to Doag Creek.

Dangers.—**Smith's Point Buoy** (spar, black, No. 21½) marks the eastern edge of the extensive shoals making out from the western shore above Maryland Point. These shoals are described under Section 3, foregoing.

Douglass Point Shoal makes out about 400 yards from the eastern shore at Douglass Point. The shoal has 5½ feet over it and is marked by a buoy (spar, red, No. 14) placed at its western edge.

Clifton Point Flats is the name given to the upper end of the extensive shoal which lies off the western shore between Potomac Creek and Chapowamsie Creek. This extensive shoal ground has from 2 to 18 feet of water over it, and its eastern edge is marked by black buoys.

Chicomuxen Creek Shoal makes out from the mouth of Chicomuxen Creek, and has 8½ to 11 feet over it. The western edge of the shoal is marked by a buoy (spar, red, No. 16).

From a point 1⅝ miles below Cockpit Point to that point it is only necessary to give the western shore a berth of ⅝ mile.

Between Cockpit Point and Hallowing Point, a distance of about eight miles, the channel leads quite close along the eastern shore, the shoals from the western shore extending out beyond the middle of the river.

High Point Flats lie off the mouth of Occoquan Creek, to the southwestward of High Point, and occupy the western side of the river. These flats have from 6 to 9 feet of water over them and are marked at their eastern edge by two buoys. High Point Flats buoy, lower (spar, black, No. 25), is opposite the mouth of Mattawoman Creek; High Point Flats upper buoy (black, spar, No. 27) is placed about 1⅓ miles **NE. ¾ N.** from the lower buoy. Abreast these buoys the channel is narrow. Shoals make out some distance from the mouth of Mattawoman Creek. There are spots in the channel which have from 15½ to 18 feet over them.

Craney Island Flats surround Craney Island: they have from 2 to 9 feet of water over them and are marked at the edge of the channel by a buoy (spar, black, No. 29). This buoy is opposite the landing at Glymont.

Hallowing Point Shoal makes off to the eastward and southeastward from Hallowing Point. It is marked at its eastern edge by a buoy (spar, black, No. 31).

Shoals make out from the eastern shore between **Chapman's Point**, about 1 mile above Glymont, and Marshall Point, the channel following the western shore between these points. **Brent's Shoal**, a part of these shoals, is marked by a buoy (spar, red, No. 18) placed on the edge of the shoal opposite White Stone Point.

The water shoals abruptly on the western side of the channel abreast of Gunston Cove, and also off the mouth of Doag Creek.

5. ***From Marshall Point (Marshall Hall) to Alexandria.***—With the landing at Marshall Point bearing S., distant 400 yards, steer **E NE. ¼ E.**, heading for the bare bluff just to the eastward of Fort Washington. Round Sheridan Point, leaving the black buoys about 150 yards on the port hand, and pass about 150 yards to the westward of the landing at River View. When abreast of River View landing steer **N.** for Jones' Point Light-house at the southern end of Alexandria. When abreast of Broad Creek Flats buoy (spar, red, No. 22) steer about **N. by E.**, keeping Rosier's Bluff open a very little on the starboard bow. Pass midway between Rosier's bluff and black spar-buoy No. 37, and then steer **N. ½ W.** for the wharves at Alexandria. Vessels will find good anchorage in the channel abreast the wharves at Alexandria.

Note.—The channel is narrow in places between Marshall Point and Alexandria. A sharp lookout should be kept for the buoys, which are the best guides in this part of the river. The channel above Alexandria is narrow, and vessels going up to Washington or Georgetown should take a pilot or tow-boat, or be guided by the buoys and chart. The direction of the channel for a distance of 2⅝ miles above the Ferry Wharf at Alexandria is **N. by E. ¾ E. Easterly.**

Remarks.—After passing Marshall Point on the **E NE. ¼ E.** course, **Mount Vernon** and the buoy (spar, red and black horizontal stripes) marking the dredged channel to the landing will be left on the port hand.

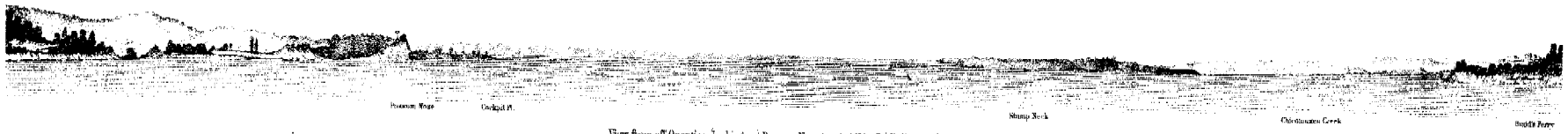
Fort Washington Light-house (see table, page 18) will be made a little on the port bow. A short distance above Mount Vernon, on the same side of the river, is **Little Hunting Creek.** When rounding Sheridan Point, Piscataway Creek (broad and shallow) will be left on the starboard hand just below Fort Washington. **River View**, a summer resort and landing, is just above Fort Washington, on the eastern shore.

Standing on the **N.** course after passing River View, **Jones' Point Light-house** (see table, page 18) should be made ahead, backed by the city of Alexandria. **Collingwood**, a summer resort and landing, will be left on the port hand just above River View. Broad Creek, a broad, shallow body of water, will be opened out on the eastern shore. The high and almost perpendicular bluff on the northern point of entrance to Broad Creek is conspicuous when coming up the river. On the **N. by E.** course, **Rosier's Bluff** (high, almost perpendicular) and the landing at **Fort Foote** will be a little on the starboard bow; the shore end of the large pier on **Marbury Point** will be ahead. The city of Alexandria will be on the port bow. The broad bight south of Alexandria is shoal, with depths of 2 to 5 feet. When off Rosier's Bluff the city of Washington will be in plain view, about 6 miles distant.

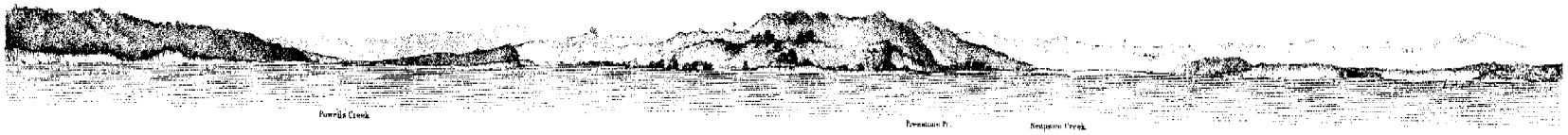
Dangers.—**Mount Vernon Flats** make out into the river ½ mile from the shore at Mount Vernon. These flats extend from Terry Point to Sheridan Point, where they join Sheridan's Shoal. Abreast Mount Vernon landing a buoy (spar, red, and black horizontal stripes) is placed on the edge of the flats to mark the entrance of the dredged cut to the landing.

Sheridan Shoal extends ¼ mile to the southward and eastward of Sheridan Point, following the contour of the land. The edge of this shoal rises abruptly from the channel, has 2 to 3 feet of water over it, and is marked by three buoys: Sheridan Point lower buoy (spar, black, No. 31½) is south of Sheridan Point; Sheridan Shoal lower buoy (spar, black, No. 33) is **W.** by **S.** from Fort Washington Light-house; Sheridan Shoal upper buoy (spar, black, No. 35) is **W.** from River View Landing.

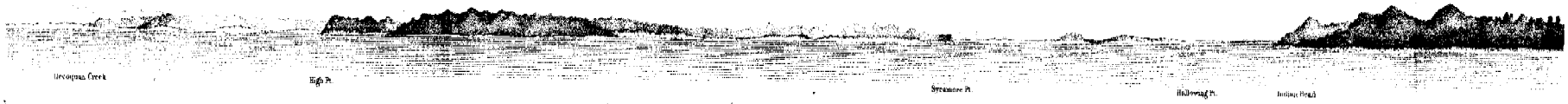
Shoals fill the bight above Bryant's Point and the mouth of Piscataway Creek. These shoals rise abruptly at the edge of the channel and have from 3 to 5 feet of water over them. **Bryant's Point** is opposite Mount Vernon and about 1¾ miles below Fort Washington.



View from off Quantico (looking up), Possum Nose bearing N by E ¼ E, distant 2¼ Miles.



View of Freestone Point from off Deep Point, Indian Head bearing NE. ⅜ E, distant 2¾ Miles.



View from off Freestone Point (looking up), Indian Head bearing NE. ⅜ E, distant 2¾ Miles.

Broad Creek Flats make out into the river from the mouth of Broad Creek; they rise abruptly from the channel and have 3 to 6 feet of water on them. The western edge of these flats is marked by a buoy (spar, red, No. 22) placed off the middle of the entrance of the creek.

Hunting Creek Flats fill the large bight south of the city of Alexandria and extend well over toward the eastern shore abreast Rosier's Bluff. These flats have 2 to 5 feet of water over them and rise abruptly from the channel. At their eastern edge they are marked by two buoys: Hunting Creek Flats lower buoy (spar, black, No. 37) is abreast Rosier's Bluff; Hunting Creek Flats upper buoy (spar, black, No. 39) is about ⅝ mile **S SE.** from Jones' Point Light-house.

Benny's Flats make out from the eastern shore above Rosier's Bluff; at the mouth of Oxon Creek their name changes to **Oxon Creek Flats**. They have only 2 feet of water over them near the edge of the channel, with slightly deeper water in-shore. Along their western edge are three buoys: Benny's Flats lower buoy (spar, red, No. 24) is about **E SE.** from Jones' Point Light-house; Benny's Flats middle buoy (spar, red, No. 26) is abreast the lower wharves at Alexandria; Oxon Creek Flats upper buoy (spar, red, No. 28) is about ⅝ mile below the end of the railroad-pier on Marbury Point; this pier serves well to mark the eastern edge of the channel above Alexandria.

ST. MARY'S RIVER†

empties into Potomac River from the northward, about 7 miles above Point Lookout and just to the westward of Smith's Creek. The river is navigable nearly to its head, a distance of over 7 miles; at its mouth it is over 1¼ miles wide, and forms an excellent anchorage, well sheltered, with 4 to 5 fathoms water and soft bottom. This anchorage is the principal one in the mouth of the Potomac for vessels seeking shelter in heavy gales. **St. Inigo's Creek** and **Carthagena Creek** are two small tributaries of St. Mary's River; they are of little importance.

St. Mary's City, a small village on the east bank of the river, about 4½ miles above its mouth, can be reached by vessels of 18 feet draught; it has some trade, carried principally in vessels owned in Chesapeake Bay and in steamers plying between Washington and Baltimore, which make landings on St. Mary's River. There is 12 feet of water at the wharf at St. Mary's City and 21 feet at the anchorage just below the wharf.

The channel at the entrance, between the shoals which make out from **Kitt's Point** on the east and **St. George's Island** on the west, is nearly ¾ mile wide; it narrows gradually and follows a mid-river course, but shoals make off some distance from all the points. Above St. Mary's City the river makes a sharp turn to the northwestward, the channel shoaling gradually toward its head.

Strangers should not attempt to enter the river at night. The buoy on the southeastern end of St. George's Island Bar is the only aid at the entrance. If a pilot is desired, one may be had from St. George's Island at the western side of the entrance.

In severe winters the river is closed by ice down to Priest's Point, about 3¼ miles from its mouth.

SAILING DIRECTIONS, ST. MARY'S RIVER.

These directions, if closely followed, will carry a least depth of 21 feet up to St. Mary's City and a least depth of 24 feet up to Priest's Point.

From the entrance to St. Mary's City.—Having followed the directions for approaching and entering Potomac River, Sections 1 or 1 A, pages 63–64, until Point Lookout Light-house is made, shape a course so as to be 1¾ miles distant from this light-house when it bears **NE.** With Point Lookout Light-house bearing **NE.**, distant 1¾ miles, steer **NW. ½ N.** about 7 miles. When the southern end of St. George's Island bears **W. ½ S.** and the shore of the island is about ¾ mile distant, steer **N.**, heading for the end of Windmill Point (low, yellow bluff, with straggling trees). Round Windmill Point, giving it a berth of at least ¼ mile, and stand to the northward, keeping in the middle of the river until abreast of St. Mary's City, when anchor in 21 feet, soft bottom.

Remarks.—On the **NW. ½ N.** course **Kitt's Point**, the eastern point at entrance to St. Mary's River, will be made on the starboard bow, and just to the eastward of the point Smith's Creek will be opened out. St. George's Island, will be made on the port bow and the entrance to St. George's River will be ahead.

Leave Kitt's Point at least ¾ mile on the starboard hand. When passing it the river will be opened to the northward. **Fort Point**, on the eastern bank, about 2¼ miles above Kitt's Point, will show quite prominently, being covered with bushy trees to the water's edge, and should be given a berth of at least ⅝ mile.

Priest's Point, about 1 mile above Fort Point, will be recognized by a large seminary which stands among the trees near its end, and should be given a berth of at least ¼ mile.

On the **N.** course **Windmill Point** (low, yellow bluff, with straggling trees), on the west shore opposite Priest's Point, will be ahead, and **Chancellor's Point**, the next point on the eastern shore above Priests' Point, should be open a little to the eastward of Windmill Point. When abreast the seminary on Priest's Point, St. Inigo's Creek will be open to the eastward. The channel leads well to the eastward of Windmill Point, but Chancellor's Point may be passed quite close-to. When passing the latter, the landing and village on **Portobello Point** will be seen to the northwestward and to the northward will be seen the landing and the high bluff on which is the village of St. Mary's.

† Shown on Coast and Geodetic Survey charts: **388**, scale $\frac{1}{60,000}$, price **$0.40**; **133**, **134**, scale of each $\frac{1}{80,000}$, price of each **$0.50**; and **376**, scale $\frac{1}{400,000}$, price **$0.50**.

There is a deep bend in the river just above St. Mary's which is called **Horseshoe Bend**; it has good anchorage in 10 to 18 feet of water.

Dangers.—For a description of dangers approaching the entrance see "Sailing Directions, Potomac River," Section 1.

Shoals make out to the southward and southwestward from Kitt's Point nearly ¾ mile; these have 2 to 12 feet of water over them and are not marked; the point should be given a berth of ¾ mile.

St. George's Island Bar is described on page 64, and should be left on the port hand when entering St. Mary's River.

Shoals extend out ½ mile to the eastward from the western shore just above the entrance to St. George's River. To avoid the shoals making off in places from the eastern shore below Priest's Point, give the eastern shore a berth of at least ⅝ mile.

Shoal water makes out nearly 300 yards from the end of Priest's Point and about 400 yards from Windmill Point. Above Windmill Point to St. Mary's City the shores can be approached to 250 yards.

Coming Down the Potomac, when Piney Point Light-house bears **N.**, distant ¾ mile, steer **SE. ¾ E.**, leaving the southern end of St. George's Island ½ mile on the port hand. Round St. George's Island Bar buoy (spar, red and black horizontal stripes), giving it a berth of ¼ to ½ mile, and stand up St. Mary's River course about **N. ½ W.** When the end of Windmill Point bears **N.** steer for it on this bearing, and continue as directed in preceding paragraph of sailing directions.

ST. JEROME'S CREEK†

is shallow and of little importance. Some grain and oysters are shipped in vessels engaged in the bay trade. The entrance of the creek is in the western shore of Chesapeake Bay, nearly 5 miles north of Point Lookout, about midway in the bight between **Point No Point** on the north and **Point Look In** on the south. A channel 100 feet wide and 9 feet deep was dredged, under the supervision of the U. S. engineers, across the bar at the entrance of the creek; the depth in this channel is said to be decreasing. Buoys are placed to mark the channel into the entrance, but above this there are no aids. The heaviest draught taken into the creek is 8 feet, but strangers never enter without a pilot.

PATUXENT RIVER‡

empties into the western side of Chesapeake Bay 17 miles above Point Lookout. It is navigable for vessels of 15 feet draught for a distance of 21 miles, and for vessels of 8 feet draught 34 miles above its mouth; lighter draught vessels than 8 feet can be taken 9 miles farther up, to the landing at Bristol. The mouth of the river forms a good anchorage in westerly winds and is frequently used by vessels bound up or down the bay as an anchorage for the night. Just inside the entrance is an excellent, well-sheltered anchorage for vessels of the largest class, which can be easily entered either in the daytime or at night. From the numerous landings on the river large quantities of produce are shipped in coastwise bound vessels and sailing vessels and steamers engaged in the bay trade.

Numerous creeks empty into the river, but only five of these are navigable for vessels of over 6 feet draught.

Mill Creek empties into the river from the northward, about 1⅝ miles west of Drum Point Light-house; 15 feet can be taken up ¾ mile above its mouth.

Cuckold Creek has several branches; it empties into the river from the westward about 5 miles above Drum Point Light-house; 10 feet can be taken into the creek and 1¾ miles above its mouth, and this depth can be taken up about 1 mile into the southern branch (**Mill Creek**).

St. Leonard's Creek empties into the river from the northeastward, about 7½ miles above Drum Point Light-house; 13 feet can be taken up 1 mile above its mouth; above this the depth gradually decreases.

Island Creek empties into the river from the northward, about 2½ miles above the mouth of St. Leonard's Creek; it has a depth of 11 feet in the channel at the entrance, but is of no commercial importance.

Battle Creek empties into the river from the northward, about 13 miles above Drum Point Light-house. It is principally the resort of local oystermen, and has a depth of 10 feet in the channel at its entrance. Strangers should not attempt to enter without a pilot.

Solomons is a village at the mouth of Mill Creek, about 1⅝ miles above Drum Point Light-house. It has a little trade and is spoken of as the terminus of a proposed railroad. A small marine railway, mostly used by oystermen, is located here.

Benedict, on the west bank of the river, 21 miles above its mouth, has some trade in produce and can be reached by vessels of 15 feet draught.

Lower Marlborough is on the east bank of the river, about 29 miles above its mouth. It can be reached by vessels drawing about 9 feet.

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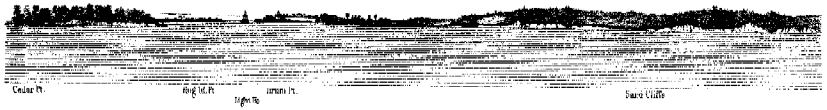
†Shown on Coast and Geodetic Survey charts: **133, 134,** scale of each $\frac{1}{80,000}$, price of each $0.50.

‡Shown on Coast and Geodetic Survey charts: **386,** scale $\frac{1}{60,000}$, price $0.20; **387,** scale $\frac{1}{30,000}$, price $0.20. These two charts include the river from its mouth to Nottingham. The entrance, to St. Leonard's Creek, is also shown on chart **134,** scale $\frac{1}{80,000}$, price $0.50; the river is also shown on **376,** scale $\frac{1}{400,000}$, price $0.50.



View of Entrance to Patuxent River from the Southward, Cedar Pt. bearing W. by N, distant 2¾ Miles.

View of Entrance to Patuxent River. Cove Pt. Lt. Ho. bearing N. by W. ¾ W, distant 4¼ Miles, and Drum Point W. ¼ N, distant 3½ Miles.

View of Cove Point and the Cliffs to the Southward, the Lt. Ho. bearing NW. by W. ¼ W, distant 1¼ Miles.

Nottingham is on the west bank, about 34 miles above the mouth of the river. It has a post office and steamboat landing.

Bristol, a small village 9 miles above Nottingham, is of little importance. The river shoals rapidly above Nottingham and only light-draught vessels and a steamer from Baltimore go up as far as Bristol.

Prominent Features and Aids.—**Cove Point**, the northern point at entrance to the river, is marked by **Cove Point Light-house** (see table, page 18). The shore to the southward of this point is hilly, with high, steep, sand bluffs facing the bay. About 4½ miles **S SW. ½ W.** from Cove Point Light-house is **Drum Point Light-house** (see table, page 18), off Drum point, on the north side of the channel. **Cedar Point**, the southern point at entrance to the river, shows a short, low, bare point, backed by higher land, with an irregular outline of trees; it bears **S. ½ E.**, distant 5 miles from Cove Point Light-house (see view). **Solomon's Island**, on the western side of the entrance to Mill Creek, and 1½ miles above Drum Point Light-house, will show plainly when standing in (see view).

The Channel of the river has good water as far as Benedict, about 21 miles above its mouth. It is quite narrow in places, but the most prominent dangers and shoals are marked by buoys, and its navigation is comparatively easy for a steamer, or for sailing vessels with a fair wind. Shoals make out from both shores to the edge of the channel, but the water as a rule decreases in depth gradually toward the banks, except where the shoals are marked by buoys. Above Benedict the channel is narrow and obstructed by shoals, which make this part of the river difficult for a stranger, although it is buoyed; if bound above Benedict they should take a pilot at the latter place.

Anchorages.—Heavy-draught vessels frequently anchor in the mouth of the river for the night. Shelter from westerly winds, is found in 3½ to 5 fathoms water from 2¼ to 3½ miles to the southward of Cove Point Light-house and quite close in to the shore. If seeking shelter from easterly winds, stand in to the entrance and anchor in 5 to 10 fathoms in the channel about 1½ miles above Drum Point Light-house. Good anchorage for light-draught vessels is found close in to the north shore west of Drum Point Light-house, taking care not to get aground on the oyster bank, which is marked by buoys. The bottom in the channel up to Benedict is generally soft and vessels can anchor where convenient.

Pilots can be found at Solomon's Island. By closely following the sailing directions a pilot is not required below Benedict, but vessels bound above this should take one there.

Repairs.—There is a small marine railway at Solomon's Island. Baltimore is the nearest place for extensive repairs to vessels or machinery of steamers.

Ice closes the river in severe winters.

Tides.—The mean rise and fall of tides at Drum Point is 1.4 feet, and at Hunting Creek, 2 miles above Benedict, 1.6 feet. It is high water at Hunting Creek 1 hour 38 minutes later than at Drum Point.

SAILING DIRECTIONS, PATUXENT RIVER.

The following directions, if closely observed, will take vessels of the largest class to an anchorage inside Drum Point. Vessels of over 15 feet draught should not attempt to go above Town Point without a pilot, as the channel is narrow and has two abrupt turns. Vessels of less than 15 feet draught can pass up the river to Benedict in the daytime, when the buoys can be seen, by closely following the directions.

1. ***Approaching and Entering.***—***From the Southward.***—Coming up Chesapeake Bay, as soon as Cedar Point is made steer so as to pass ¾ to 1 mile to the eastward of it and when it bears **W.**, steer **NW.** When Drum Point Light-house bears **W. ½ S.**, steer for it, keeping on the bearing until it is about ½ mile distant ahead, then steer **SW.** by **W. ½ W.**, and anchor at discretion inside the light-house. Or, proceed as directed in Section 2 following.

At night.—As soon as Cove Point Light-house is made, steer for it on any bearing between **NW.** by **N.** and **N.** by **W.** until Drum Point Light-house bears **W. ½ S.**, then steer for the latter, and follow the directions in preceding paragraph.

Remarks.—**Cedar Point** is a low, sandy point, 15½ miles to the northward of Point Lookout Light-house. This point is comparatively bold-to, 4 fathoms being found ⅜ mile to the eastward of it. Passing Cedar Point, **Drum Point Light-house** (see table, page 18) will be seen to the westward in the entrance of the river. The **W. ½ S.** course leads in the best water in the entrance of the river.

Dangers.—**Hog Island Shoal**, in the entrance of the river, makes out nearly ½ mile to the northward of a point 1¾ miles to the westward of Cedar Point. This shoal has 5 to 17 feet of water over it, and is marked at its northern edge by a buoy (can, black, No. 1).

Little Cove Point Shoal makes out ¾ mile to the eastward of **Little Cove Point**, and about 1¾ miles south of Cove Point Light-house. It has 7 to 17 feet of water over it, and is marked by a buoy (spar, red, No. 2) placed off its eastern end. The shore to the southward of this shoal should be given a berth of ⅜ mile until close up to Drum Point Light-house, which can be approached from the southward to 100 yards.

1 A. ***Approaching and Entering.—From the Northward.***—Standing down the bay steer so as to pass about ¾ mile to the eastward of Cove Point Light-house, and when it bears **W.**, steer **S.** ¼ **E.** until Drum Point Light-house bears **W.** ½ **S.** Now steer for Drum Point Light-house, bearing **W.** ½ **S.**, and when the latter is ½ mile distant steer **SW.** by **W.** ½ **W.** Anchor at discretion inside Drum Point, or follow the directions in Section 2 following.

These directions will answer for either day or night.

Note the Remarks and Dangers under Section 1, foregoing.

2. ***From Drum Point Light-house to Benedict.***—When Drum Point Light-house bears **N.**, distant about ¼ mile, steer **W.** by **S.**, passing south of *Middle Ground buoy* (spar, red, No. 4). When abreast this buoy, steer about **W.** ¼ **S.** and pass *Sandy Point Shoal buoy* (spar, red, No. 6). When the latter buoy (red, No. 6) is well abaft the starboard beam, distant about ¼ mile, steer **N NW.** ½ **W.**, and pass about midway between **Town Point** and the eastern shore. (Town Point is level and cleared, ending abruptly, and showing bare, steep, sandy faces at extremity; a sand-spit makes out some distance from the end, and on the north side there is a landing and the ruins of another). Round Town Point, giving it a berth of nearly ¼ mile, and steer about **W NW.** ½ **W.** so as to clear the end of **Point Patience** (long, low, sandy point, with cedar trees at intervals, and white sand beach), which is on the starboard bow, and give it a berth of about 250 yards. The channel between the 18-foot curves is only 400 yards wide off Point Patience.

Round Point Patience, and when the end of the point bears about **E.**, distant 250 to 300 yards, steer about **N.** by **E.** ¾ **E.** for the narrow entrance of **Hellen's Creek**, and keep *Hawk's Nest buoy* (spar, black, No. 5), off the entrance to **Cuckold's Creek**, on the port hand. When approaching black buoy No. 5, leave it 300 yards on the port beam and steer about **N.** by **W.** ½ **W.** On this course *Helen's Creek Bar buoy* (spar, red, No. 8) will be left about 250 yards on the starboard hand, and the high dark bluff, forming the western point at entrance of St. Leonard's Creek, will be on the starboard bow. When about 1¼ miles above buoy No. 8, and in mid-stream off the entrance of St. Leonard's Creek, steer about **NW.** by **W.** ¼ **W.** On this course **Setterly Point** (bluff, sandy faces) and *Setterly Point Flats buoy* (spar, black, No. 7) will be left on the port hand; there is a steamboat landing about ¾ mile below Setterly Point and another about 1 mile above it. **Broome's Island** or point (low, grassy, with a few scattered trees back from end of point) and *Broome's Island Shoal buoy* (spar, red, No. 10) will be made a little on the starboard bow and left on the starboard hand.

When buoy No. 10 is about 250 yards on the starboard beam steer about **NW.** ½ **W.** Standing on this course *Battle Creek Shoal buoy* (spar, red, No. 12) should be made a little on the starboard bow and left on the starboard hand when passing. From Battle Creek Shoal buoy steer **NW.** by **N.** On this course *Middle Ground buoy* (spar, red, No. 14) will be left 150 yards on the starboard hand and **Sheridan's Point** (long, low, white, sandy, with low, scattered trees) will be a little on the starboard bow; *Marsh Point Shoal buoy* (spar, black, No. 9), abreast Marsh Point, will be on the port bow, and is left about 100 yards on the port hand. When Sheridan's Point bears **E.**, distant about 200 yards, steer about **N NW.** ¼ **W.** for the houses of Benedict.

When Flat's buoy (red, No. 16) bears **N.** ½ **E.** head up for it and anchor when abreast it. If of over 10 feet draught, vessels are advised to take a pilot at Sheridan's Point, as the channel above it is narrow and there are no buoys to mark it until nearly up to Benedict. A stranger should anchor in the channel to the southward of Flats buoy (spar, red, 16), opposite Benedict, or take a pilot if bound farther up the river.

HERRING BAY †

is a broad bight in the western shore of Chesapeake Bay, about 25 miles above the mouth of the Patuxent River, and 12½ miles below Severn River (Annapolis Harbor) entrance. This bight is sometimes used by vessels as an anchorage in westerly winds, and small vessels engaged in the bay trade find anchorage and shelter behind Parker's Island Bar in 9 to 10 feet water, soft bottom. **Parker's Island Bar** has 1 to 3 feet of water over it and extends about 1¾ miles in a southerly direction from the northern shore of Herring Bay; at its southern end is a buoy (spar, red, No. 2). A narrow channel with 11 feet of water leads around the southern end of the bar into the anchorage. **Holland Point** (dark, heavily wooded, ending abruptly), the southern point at entrance into Herring Bay, has extensive shoals extending off from it in an easterly and northeasterly direction. These shoals are marked by two buoys

† Shown on Coast and Geodetic Survey chart 135, scale $\frac{1}{80,000}$, price $0.50.

one on the eastern side of the shoals and one off their northern point. The buoys are the only guides; some local knowledge is necessary to make the anchorage behind Parker's Island Bar.

WEST RIVER †

empties into the western side of Chesapeake Bay 122 miles above Cape Henry Light-house and about 6 miles below Severn River. Its entrance is **W NW.** from Bloody Point Bar Light-house, and has a depth of 13 feet in a channel, marked by several buoys. The depth above the mouth of the river gradually decreases, but 9 feet can be carried to the landing and about 3 miles up the river. There is a small village on the south bank about 1 mile inside of Curtis Point. **Rhode River**, emptying into the north side of West River just inside its entrance, has a depth of 9 feet in the channel for a distance of 2 miles above its mouth. There is a landing on the eastern bank just above the mouth. Several small creeks of no importance empty into West River above Rhode River entrance. These waters are frequented principally by vessels engaged in the bay trade; strangers seldom enter unless of light draught. Extensive shoals make out 1¾ miles to the northeastward from **Curtis Point**, the southern point at entrance, and about ⅛ mile from the northern side of the entrance. The buoyed channel is between these shoals.

GENERAL DIRECTIONS, WEST RIVER.

The following directions are good for a draught of 11 feet or less in the daytime, when the buoys can be seen.

1. ***Approaching and Entering.—From the Southward.***—Coming up the bay, leave Bloody Point Bar Light-house about 2¼ miles on the starboard hand and steer about **N. ½ W.** for the old light-house tower on Thomas' Point. When Bloody Point Bar Light-house bears **SE. ½ E.** steer about **W NW.**, heading fair between *Saunder's Point Shoal buoy* (spar, red, No. 2) on the north side of the entrance and *Curtis Point Shoal buoy* (can, black, No. 1) on the south side of the entrance. Round black can-buoy No. 1, leaving it about 300 yards on the port hand, and steer so as to pass *Dutchman's Point Flats buoy* (spar, red, No. 4) about 150 yards on the starboard hand. When abreast of red spar-buoy No. 4 steer about **W.** by **S.** 1 mile and anchor in 13 feet water, soft bottom, off the mouth of Rhode River.

If bound up Rhode River follow a mid-river course.

If bound up West River it is advisable for a stranger to take a pilot.

1 A. ***Approaching and Entering.—From the Northward.***—Coming down the bay, pass ½ mile to the eastward of Thomas' Point Shoal Light-house and when the light bears **NW.**, distant ½ mile, steer **W SW.** This course will lead fair between Saunder's Point Shoal buoy (spar, red, No. 2) and Curtis Point Shoal buoy (can, black, No. 1). When the latter buoy bears **S.** steer **S SW. ½ W.**, leaving red spar-buoy No. 4 about 150 yards on the starboard hand and follow the directions under Section 1 foregoing.

Remarks.—On the **W SW.** course Curtis Point Shoal buoy (can, black, No. 1) will be made on the port bow, and Saunder's Point Shoal buoy (spar, red, No. 2) on the starboard bow.

The **S SW. ½ W.** course leads clear of dangers until up to Dutchman's Point Flats buoy (spar, red, No. 4) and about 350 yards to the westward of Curtis Point Shoal buoy.

SOUTH RIVER †

empties into the west side of Chesapeake Bay 125 miles above its mouth and about 3 miles below Severn River entrance. **Thomas' Point Shoal Light-house** marks the northern point at entrance. South River is mostly frequented by vessels in the bay trade. It has a narrow channel with a depth of 15 feet for 6 miles above its mouth, and 8 feet 2 miles farther up. Numerous small creeks empty into the river; many of these have good water in their channels but are of no importance to strangers. The shoals on both sides of the entrance to South River and the narrow parts of the channel for a distance of 3½ miles above its mouth are marked by buoys.

GENERAL DIRECTIONS, SOUTH RIVER.

The following directions are good for vessels of 13 feet or less draught in the daytime when the buoys can be seen.

1. ***Approaching and Entering.—From the Southward.***—Standing up the bay, when Bloody Point Bar Light-house bears **SE.** steer **NW.**, keeping the bearing. On this course **Turkey Point** will be ahead. *South River entrance buoy* (nun, red, No. 2) *Marshy Point buoy* (spar, red, No. 2½ and *Turkey Point Middle Ground buoy* (spar, black, No. 1) will be made on the starboard bow; the former is left well on the starboard hand and red spar-buoy No. 2½ should be left about

† See foot-note on page 72.

150 yards on the starboard hand. Haul to the northward and leave black spar-buoy No. 1 close-to on the port hand. Round black spar-buoy No. 1 and steer about **NW.** Anchor in the channel when inside Turkey Point.

If bound farther up the river, follow the buoys closely. A stranger should take a pilot.

1 A. ***Approaching and Entering.—From the Northward.***—Coming down the bay, steer about **S.** by **W.** ¾ **W.**, leaving Thomas' Point Shoal Light-house (see table, page 18) and buoy (can, black, No. 17) on the starboard hand. Round black can-buoy No. 17; steer **W.** ½ **N.**; *South River Entrance buoy* (can, red, No. 2) will then be on the starboard bow. Leave it about ¼ mile on the starboard hand, and when *Turkey Point Middle Ground buoy* (spar, black, No. 1), which will be seen to the northwestward, bears **N NW.**, steer for it and leave red spar-buoy No. 2½ about 150 yards on the starboard hand. Round black spar-buoy No. 1 leaving it on the port hand and follow the directions in section 1 foregoing.

SEVERN RIVER AND ANNAPOLIS HARBOR †

Severn River empties into the western side of Chesapeake Bay about 128 miles above Cape Henry. For a distance of about 5½ miles from its mouth it has an average width of about ⅝ mile; it then broadens into what is known as **Round Bay.** This bay is about 1 mile wide and 2 miles long, and has a general depth of from 21 to 24 feet. A number of small unimportant creeks empty into the river. It has but little trade, and is of importance only as the approach by water to the city of Annapolis and the U. S. Naval Academy. About ½ mile above the Naval Academy it is crossed by a county bridge, and a railroad draw-bridge about 300 yards farther up.

Annapolis, the capital of the State of Maryland, and the **U. S. Naval Academy Grounds**, are on the western bank of the river, near its month.

Graveyard Creek is on the north side and **Spaw Creek** on the south side of the city of Annapolis, and they are both tributaries of the Severn River.

Prominent Features.—Tally's Point, the southern point at the entrance of the river, can be distinguished by several large buildings, and a wharf on its southern and another on its northern sides. **Bay Ridge** is a summer resort, on this point. **Greenbury's Point**, on the northern side of the entrance, is marked by Greenbury's Point Light-house (see table, page 18). When the river entrance is opened out in standing up or down the bay, the **State House** at Annapolis is a prominent landmark.

The Channel entering the river is comparatively narrow and has a least depth of 19 feet. It is marked by buoys up to the anchorage off Annapolis. Extensive shoals make out to the edge of the channel from both sides of the entrance. Above Annapolis the channel is good for 19 feet of water into Round Bay, and the latter has a depth of 21 to 24 feet, with several spots of a less depth.

Anchorages.—A good anchorage for the night, will be found in **Annapolis Roads**, which is fairly sheltered from westerly winds. Vessels of 18 feet draught or less can find good anchorage in the channel to the westward of Greenbury's Point Light-house. Those engaged in the bay trade of 12 feet or less draught usually anchor in the bight west of the light-house or in the creek on the south side of Annapolis.

Pilots and Tow-boats.—Fishermen or oystermen, who are competent pilots, will be found in the entrance if required. Baltimore tow-boats that will tow vessels up the Severn River can usually be found in the bay.

Ice seldom interferes with navigation except in very severe winters, and then only for a limited time.

Tides.—The mean rise and fall of tides is .9 foot, but winds influence them very much.

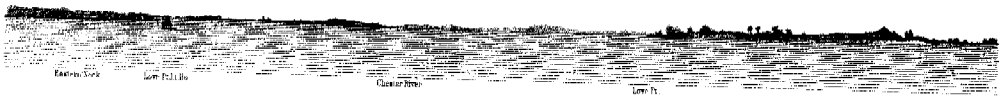
SAILING DIRECTIONS, ANNAPOLIS HARBOR.

These directions are good for vessels of 18 feet draught or less in the daytime, in clear weather, when the buoys can be seen. A stranger should not attempt to enter at night unless of light draught.

1. ***Approaching and Entering.—From the Southward.***—Having followed the directions in Section 5, "Sailing Directions, Chesapeake Bay," pages 30–31, when Thomas' Point Shoal Light-house bears **W.**, distant ¾ mile, steer about **N.** ¼ **E.** until the hotel cupola at Bay Ridge bears **W.** by **N.**; Tally's Point Shoal buoy (can, black, No. 19) will then be ½ mile distant abaft the port beam. Then steer for Greenbury's Point Light-house, course about **N NW.** ¾ **W.**, and when the end of Tally's Point bears **SW.** by **S.**, steer **NW.** by **W.** with the dome of the state-house directly ahead, and pass about 100 yards to the southward of Greenbury's Point Shoal buoy (nun, red, No. 2). Then follow the directions in Section 2 following.

The easiest directions for a stranger to follow are, when standing up the bay in clear weather, to

† Shown on Coast and Geodetic Survey chart **135**, scale $\frac{1}{80,000}$, price $0.50. Annapolis Harbor is also shown on chart **385**, scale $\frac{1}{10,000}$, price $0.50.



Entrance to Chester River from the Northward, Love Pt. Lt. Ho. bearing SE. distant 2¾ Miles.

Thomas' Point and Lt. Ho., Old Tower N.W. by N., distant 2¾ Miles.

Shore between Thomas' and Tally's Pts. (Approaches to Severn River) Old Tower bearing W. ½ S. distant 1½ Mile.

bring the dome of the state-house to bear **NW.** by **W.** and steer for it on this bearing until up to Greenbury's Point Shoal buoy (nun, red, No. 2). This will lead in the best water and well clear of all dangers.

If seeking an anchorage in Annapolis Roads, anchor anywhere on the **N NW.** $\frac{3}{4}$ **W.** course in 19 to 22 feet of water, with Tally's Point bearing between **W SW.** and **S SW.**

Remarks.—Tally's Point will be recognized by the large hotel pavilion and wharf at **Bay Ridge,** a summer resort; the point is left about 1¼ miles on the port hand. Heading for Greenbury's Point Light-house, the dome of the state-house and the city of Annapolis will be opened out on the port bow; the buoys marking the entrance to the channel into the harbor should also be made on the port bow.

Dangers.—**Tally's Point Shoal** makes out 1 mile **SE.** by **E.** from the point and has from 2 to 13 feet of water over it. The end of the shoal is marked by a buoy (can, black, No. 19).

Greenbury Point Shoal makes out nearly $\frac{3}{4}$ mile to the southward and southeastward from the point; it has from 2 to 13 feet of water over it and shoals gradually when approached from the southeastward. At its southeastern edge the shoal is marked by a buoy (nun, red, No. 2).

Shoals make out from both sides of the entrance above Tally's Point, and vessels of over 14 feet draught should follow the directions closely.

1 A. ***Approaching and Entering.—From the Northward.***—Coming down the bay, leave Sandy Point Light-house $\frac{1}{2}$ mile on the starboard hand and steer **SW.** by **S.,** giving the western shore a berth of 1 mile. When Greenbury's Point Light-house bears **W NW.** $\frac{5}{8}$ **W.** and is in range with the dome of the State-house in Annapolis, Hackett's Point Shoal buoy (can, black, No. 21) should be about $\frac{3}{8}$ mile on the starboard beam. Then steer **W SW.** until Greenbury's Point Light-house bears **N NW.** $\frac{3}{4}$ **W.,** when the course should be changed to **NW.** by **W.** so as to pass about 100 yards south of Greenbury's Point Shoal buoy (nun, red, No. 2). Then follow directions in Section 2.

Remarks.—On the **SW.** by **S.** course from Sandy Point Light-house, Thomas' Point and the old light-tower will be ahead and **Thomas' Point Shoal Light-house** (white pile structure, see table of lights, page 18) will be made on the port bow. As **Hackett's Point** (the point at northern entrance to Annapolis Roads and about midway between Sandy Point and Tally's Point) is approached, the dome of the State-house at Annapolis will show over the land (**Greenbury's Neck**), and **Greenbury's Point Light-house** (see table of lights, page 18) will be seen on the southern end of the neck. The large bight between Hackett's Point and Greenbury's Point is only used by very small vessels and is of no importance. On the **W SW.** course Tally's Point will be on the port bow and a wreck-buoy (spar, red and black horizontal stripes) will be left about $\frac{3}{8}$ mile on the starboard hand. On the **NW.** by **W.** course the dome of the State-house will be ahead.

Dangers.—**Hackett's Point Shoal** makes out about 1 mile in a southerly and southeasterly direction from the point and has from 2 to 15 feet of water over it; the southeastern edge of the shoal is marked by a buoy (can, black, No. 21) which is left on the starboard hand in entering.

A red and black horizontal striped spar-buoy lies 1 mile **SE.** $\frac{3}{4}$ **E.** from Greenbury's Point Light-house. This buoy should be left on the starboard hand in entering.

See also Dangers under Section 1 preceeding.

2. ***From Greenbury's Point Shoal buoy to the anchorage abreast the Naval Academy.***—With red nun-buoy No. 2 about 100 to 150 yards on the starboard beam steer **NW.** by **N.,** and when Greenbury's Point Light-house bears **NE.** by **E.** steer **N.** by **W.** $\frac{1}{2}$ **W.** until abreast Sycamore Point Flats buoy (spar, black, No. 5), then haul to the westward and bring Greenbury's Point Light-house over the stern, bearing **SE.** by **E.,** and steer **NW.** by **W.** Anchor about 200 yards to the eastward or 100 yards to the northeastward of Santee wharf, or in the channel below the wharf.

Vessels of less than 13 feet draught, after passing the ordnance wharf, can stand to the westward and anchor in the cove south of the Naval Academy, about 500 yards to the southwestward from the end of the Santee wharf.

Vessels bound up the river above the Naval Academy should take a pilot or tow-boat.

Remarks.—On the **NW.** by **N.** course the east end of the county bridge will be ahead; Carr's Creek (small, unimportant) will be opened out just to the westward of Greenbury's Neck. On the **N.** by **W.** $\frac{1}{2}$ **W.** course the ordnance wharf will be a little on the starboard bow, black can-buoy No. 3 will be left on the port hand, Port Madison Shoal buoy (spar, red, No. 4) about $\frac{1}{4}$ mile on the starboard hand, and Sycamore Point Flats buoy (spar, black, No. 5) will be made a little on the port bow and left on the port hand. On the **NW.** by **W.** course the **Santee wharf,** built out from the eastern point of the Naval Academy grounds, will be a little on the port bow, and several mooring buoys (for naval vessels) will be seen ahead. The wharves of the city of Annapolis will be seen to the westward of the Naval Academy.

Dangers.—**Greenbury's Point Shoal** rises abruptly from the channel when the light-house bears about **N NE.**

Chink's Point Shoal is the name given to the shoal making out from the western shore between 1 and 2 miles

above Tally's Point; 11 feet of water is found ½ mile off shore on this shoal, and 15 feet at the buoy (can, black, No. 1) which marks its eastern edge.

Horn Point Shoal makes out about ⅝ mile to the eastward from **Horn Point**, the point west from Greenbury's Point, and rises abruptly from the channel; the water shoals from 25 to 6 feet within 100 yards of its end, which is marked by a buoy (can, black, No. 3).

Sycamore Point Flats buoy (spar, black, No. 5) marks the eastern edge of the Flats, with 13 to 16 feet of water over them, which lie in the mouth of Spaw Creek, between Horn Point Shoal and the Naval Academy. These flats afford good anchorage for vessels of 10 feet or less draught.

Fort Madison Shoal buoy (spar, red, No. 4) marks the western edge of the 12-foot curve of the shoal which makes out to the southward from the eastern end of the Naval Ordnance Proving Grounds. Heavy-draught vessels should favor the black spar-buoy (No. 3) when passing between it and Fort Madison Shoal buoy.

Shoals make out from the northern shore, just above the ordnance wharf, which contract the channel to a width of about 150 yards. The narrowest part is where the end of the ordnance wharf bears **NE. ½ E.**

MAGOTHY RIVER †.

empties into the western side of Chesapeake Bay, about 134 miles above Cape Henry and 5 miles below Bodkin Point, the southern point at entrance to the Patapsco River. The river entrance between **Stony Point** on the north and **Persimmon Point** on the south is nearly ½ mile wide, but a bar stretches across this entrance, over which there is a narrow buoyed channel having a depth of 10 feet. The river is frequented only by vessels engaged in the bay trade; the deepest draught taken in is 12 feet, and a draught of 8 feet can be taken up about 10 miles to **Indian Landing**, the head of navigation. **Sandy Point Light-house** (see table, page 20), 3¼ miles to the southeastward of the river entrance, is the principal guide in approaching (see view). Several unimportant creeks and branches empty into the river. **Deep Creek**, on the south side, just inside the mouth of the river, is frequently used as an anchorage by local vessels in heavy weather. **Sillery Bay** is a large cove with 8½ to 12 feet of water, on the west side of the northern point of entrance to the river.

GENERAL DIRECTIONS, MAGOTHY RIVER.

These directions are good for a vessel of 9 feet or less draught, in clear weather.

1. ***Approaching and Entering.—From the Southward.***—Standing up the bay, pass ½ to ¾ mile to the eastward of Sandy Point Light-house, and when it bears **SW.**, distant ¾ mile, steer about **NW. ½ N.** so as to pass north of *Magothy Entrance buoy* (spar, black, No. 25). On the **NW. ½ N.** course the river entrance will be on the port bow. Leave black spar-buoy No. 25 about 150 yards on the port hand and steer **W NW. ¼ W.**, heading into the entrance of the river with *Mountaineer Bar buoy* (spar, red, No. 2) on the starboard bow and *Persimmon Point Shoal buoy* (spar, black, No. 1) on the port bow. Pass between these buoys, and when well inside the entrance haul a little to the northward and anchor off the mouth of Deep Creek in 12 to 13 feet water, soft bottom.

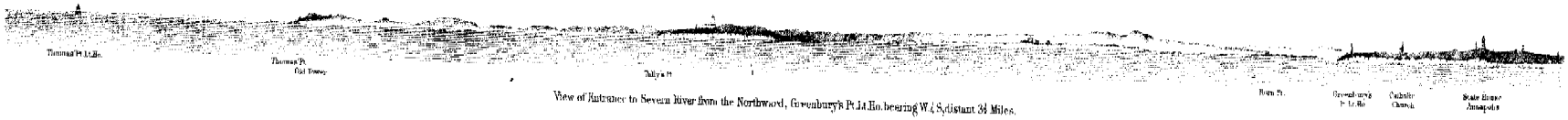
1 A. ***Approaching and Entering.—From the Northward.***—Coming down the bay, when Love Point Light-house bears **E. ¼ S.** steer **W. ¼ N.**, heading into the entrance of the river. *Magothy River Entrance buoy* (spar, black, No. 25) will be left well on the port hand, and *Craighill Channel Lower Entrance buoy* (nun, red, No. 2) will be left on the starboard hand. When the two buoys in the entrance of the river are made, steer so as to pass about midway between them, and when past *Persimmon Point Shoal buoy* (spar, black, No. 1) steer about **NW.** by **N.**, and anchor off the mouth of Deep Creek in 12 to 13 feet water, soft bottom.

PATAPSCO RIVER AND BALTIMORE HARBOR. ‡

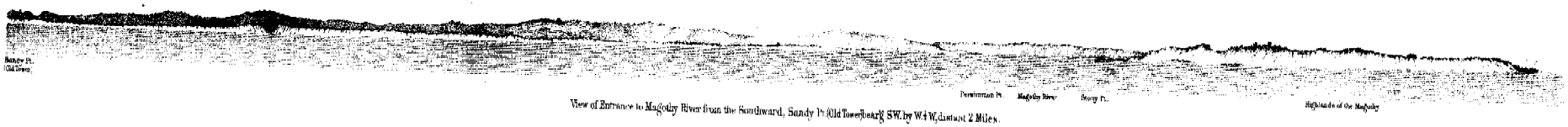
The Patapsco river empties into Chesapeake Bay from the northwestward, 140 miles above Cape Henry Light-house. Between Bodkin Point, the southern point of entrance, and North Point, the northern point of entrance, the river is about 3¾ miles wide; this width gradually decreases, and at Fort Carroll, 6½ miles above Bodkin Point, it is about 1⅝ miles wide; above Fort Carroll the river again widens and then gradually contracts until abreast of Fort McHenry, to the eastward of which is the entrance to Baltimore Harbor. The river turns more to the westward at Fort McHenry, and 1½ miles farther up is crossed by a draw-bridge (Long Bridge) through which the Middle Branch is entered; the width of the draw in this bridge is 70 feet. Patapsco River is important as the approach to the city of Baltimore, which is on the north shore near the head of navigation, and about 11 miles

† Shown on Coast and Geodetic Survey charts: **135**, scale $\frac{1}{80,000}$, price $0.50; **376**, scale $\frac{1}{400,000}$, price $0.50.

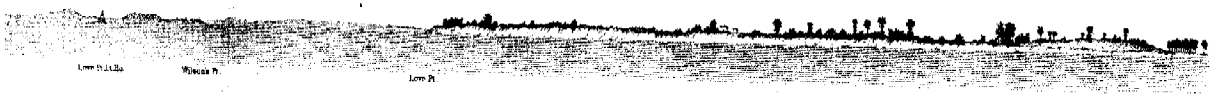
‡ Shown on Coast and Geodetic Survey charts: **136**, scale $\frac{1}{80,000}$, price $0.50; **376**, scale $\frac{1}{4,000,000}$, price $0.50. Baltimore Harbor is also shown on chart **384²**, scale $\frac{1}{10,000}$, price $0.50.



View of Entrance to Severn River from the Northward, Greenbury's Pt. Lt. Ho. bearing W. ¼ S, distant 3¾ Miles.



View of Entrance to Magothy River from the Southward, Sandy Pt. (Old Tower) bearing SW. by W. ¼ W, distant 2 Miles.



View of Approach to Chester River from the Southward, Love Pt. Lt. Ho. bearing E. NE. ¼ E., distant 3¾ Miles.

above its mouth. The entrance to the river is obstructed by shoals through which channels have been dredged under the supervision of the U. S. engineers; these channels have a depth of 27 feet at low water and their width ranges from 250 to 400 feet. Dredging is still in progress to widen the channels at their narrower parts.

Bodkin Creek, making in to the southwestward, just inside Bodkin Point, has a narrow, shallow channel, and is only frequented by vessels of 10 to 15 tons engaged in local produce trade.

Old Road Bay lies between North Point and Sparrow's Point on the north side in the entrance of the river. Two unimportant creeks, **North Point Creek** and **Welshman's Creek**, empty into the head of the bay.

Rock Creek empties into the Patapsco from the southwestward, about 4 miles above Bodkin Point and just to the westward of **Rock Point**. It is of little importance to strangers, but has a large local trade in produce, carried partly by steamers running to Baltimore. **Jacobsville** is a village near the head of the creek. The creek is sometimes used as an anchorage by oystermen seeking shelter from southerly and easterly winds.

Stoney Creek empties into the Patapsco from the southwestward, about 1 mile above the entrance to Rock Creek. It is of little importance except as a summer resort and for its local trade in produce. The channel is narrow and has a depth of 10 feet at low water.

Bear Creek and **Humphrey's Creek** have a common entrance **NE.** from Fort Carroll and to the westward of Steelton. These creeks are of no importance except for the local trade in produce and cordwood. The entrance is crossed by a draw-bridge and the channel is marked by two buoys, one below and one above the bridge.

Curtis Creek is the most important tributary of Patapsco River; its entrance is in the western shore, about 1¾ miles above Fort Carroll, and has a depth of 20 to 24 feet. A spot with 15 feet lies in the middle of the entrance, with deeper water around it. Large quantities of produce are shipped from the landings on the creek, and at **Stone House Cove**, about 1 mile above the mouth of the creek, is a large railroad pier, the terminus of a branch of the B. & O. R. R. Vessels bring lumber, iron, and railroad-ties to the pier, and load with fertilizers for southern ports. A large car-factory is located near the pier.

Baltimore Harbor makes in to the northward between **Lazaretto Point** on the east and **Fort McHenry** on the west, where it is about 500 yards wide; inside Fort McHenry the harbor has a width of about 850 yards until up to **Fell's Point**, where it narrows to 400 yards. Above Fell's Point its width gradually decreases to the head of the harbor, which is about 2½ miles above Fort McHenry. The upper end, above the City Dock, is called **The Basin**. On the north side, about east from the observatory on Federal Hill, is the entrance to **City Dock**—used principally by vessels in the lumber trade. A draw-bridge crosses the entrance to City Dock at Block Street. The depth of water in the harbor and basin is from 17 to 30 feet.

Middle Branch, which makes to the northward just above the draw-bridge, near the head of the river, has a buoyed channel with a depth of 15 feet at low water, which is being improved by dredging; this depth can be carried to the principal wharves in the branch. Schooners carrying coal, wood, and ice load and discharge at the wharves; they usually take a tow-boat when entering and passing out, on account of the narrow channel.

The city of **Baltimore** is one of the important commercial cities in the United States; it has a large foreign and coasting trade, and is the principal market for the farm produce and oysters which are shipped from the many tributaries of Chesapeake Bay. Vessels of all classes and sizes enter and clear from the port; the deepest draught entering is about 25 feet and clearing 26½ feet. Large quantities of grain are shipped to Europe; the Baltimore and Ohio R. R. and Northern Central Railway have elevators at which vessels of the largest class can load.

Steelton is a thriving village on the north shore of the Patapsco River, about 1½ miles below Fort Carroll. It has large iron and steel works and a pier, which is reached through a dredged channel from Brewerton Channel: it is the terminus of a branch of the B. & O. R. R. Steamers and sailing vessels bring iron ore to the works, unloading at the pier. The village is lit up by electric lights at night.

Channels.—The Craighill, Cut Off, and Brewerton channels lead through the shoals off the mouth of the river up to Fort Carroll, above which the Fort McHenry Channel leads into Baltimore Harbor. These channels, if followed in the order named, have a depth of 27 feet and a width of 250 to 400 feet. The natural channel of the river between Seven Foot Knoll Light-house and Baltimore has a depth ranging from 15 to 24 feet. Shoals make out from the shores, but the principal dangers are marked by buoys, as are also the dredged channels. The **Craighill Channel** is dredged to a depth of 27 feet and width of 400 feet (in 1889) from its entrance to the junction of the Cut Off Channel. The entrance from Chesapeake Bay is about 3¾ miles **N. ½ W.** from Sandy Point Light-house and about 1¼ miles from the western shore of the bay, where it is marked by a first class nun-buoy (red, No. 2). The channel follows a **N. ¼ E.** direction about 5¼ miles, on a range of two light-houses ahead (see table of light-houses, page 20), to its junction with the Brewerton Channel. The starboard side (entering) of Craighill Channel is marked by a number of red buoys, which are placed close to the edge of the channel and can be readily distinguished in clear weather.

About 2½ miles below the junction of the Craighill and Brewerton channels the **Cut Off Channel** leads from the Craighill to the Brewerton channels in a **N NW. ½ W.** direction. This channel has a width of 400 feet and depth of 27 feet, and is marked by a line of black buoys left on the port hand and two range-lights (see table of light-houses, page 20) ahead when entering. **Seven Foot Knoll Light-house** (see table, page 20) is about ¼ mile to the eastward of this channel and about midway its length.

The **Brewerton Channel**, from the junction of the Cut Off Channel to Fort Carroll, has a depth of 27 feet and a width of 250 to 275 feet (in 1890). The entrance of this channel from Chesapeake Bay to its junction with the Cut Off Channel has a depth of 19 to 27 feet; it is 3⅝ miles **E. ¾ S.** from Seven Foot Knoll Light-house, and is marked by a spar-buoy (red, No. 2). The direction of the channel is **NW.** by **W. ¾ W.** for a distance of 8½ miles; it leads about ⅞ mile to the northward of Seven Foot Knoll Light-house, and the starboard side, when entering, is marked by a number of red buoys. Two light-houses in range † (the front one on Hawkins' Point and the rear one on Leading Point, see table, on page 20) are the guides for this channel, and also indicate the points for turning into it when entering by the Cut Off or Craighill channels.

Fort McHenry Channel is 250 to 300 feet wide and 27 feet deep (in 1890); it leads in a **NW.** by **N.** direction from its junction with the Brewerton Channel to the entrance of Baltimore Harbor, between Lazaretto Point and Fort McHenry. This channel passes through a part of Patapsco River, which has a general depth of 19 to 25 feet, and was dredged for vessels of the heaviest draught entering Baltimore. It leads about 400 yards to the westward of Fort Carroll Light-house, and is marked on its eastern edge by a number of red buoys, which are left on the starboard hand when entering.

Above Fort McHenry a channel with a least depth of 27 feet and width of 100 yards leads along the wharves of the southern shore to **Locust Point.**

Prominent features.—Seven Foot Knoll Light-house and the Front Range Light-house of the Craighill Channel range will be readily distinguished (see table of lights, page 20). **Bodkin Point**, the southern point at entrance, is low, but to the southward of the point the shore line is hilly, showing abrupt, bare bluffs. **North Point** is low, backed by trees, and has the front light of the Cut Off range at its southwestern side (see table of lights, page 20). **Steelton**, with its large iron and steel works, is situated on **Sparrow Point**, about 2½ miles to the northwestward of North Point. **Fort Carroll**, an unfinished casemated masonry structure with a light-house on its southwestern end (see table of lights, page 20), is in the middle of the river about 4 miles above North Point, and about the same distance below Fort McHenry. **Hawkins' Point** and light-house (see table of lights, page 20) is to the westward of Fort Carroll; the **Quarantine Grounds** and anchorage are just above Hawkins' Point, on the western side of the channel. **Fort McHenry** is a masonry structure on the western point at entrance to Baltimore Harbor and 4 miles above Fort Carroll. The grassy slopes of some unfinished earthworks face the channel down the river. **Lazaretto Point** and light-house is on the eastern side of the entrance to Baltimore Harbor (see table of lights, page 20). The grain elevators of the B. & O. R. R. and the N. C. R'y show very prominently to vessels approaching the city of Baltimore. **Federal Hill** is a high hill, with a tall flag-staff, on top, about 1¾ miles **NW.** from Fort McHenry. The Wind Signals of the U. S. Signal Service are displayed from this flag-staff, and can be plainly distinguished by vessels standing up the river or at anchor in the harbor.

Pilots.—Pilotage for the port of Baltimore is compulsory for foreign vessels, for vessels from a foreign port, and vessels sailing under register, except those engaged exclusively in the coasting trade. Vessels of over 100 tons sailing under a coasting license are exempt from compulsory pilotage, provided they apply for and obtain from the board of pilots in the city of Baltimore a license to navigate Chesapeake Bay without a pilot; for this license, which is good for twelve months from date of issue, a charge of six cents per ton is made. Pilotage laws and rates for the State of Maryland are given in Appendix I.

Maryland pilots will be found cruising at the entrance of Chesapeake Bay. On the stern, foresail, and mainsail of every pilot-boat is painted the name of the boat and the port from which it hails.

Tow-boats.—Large and powerful tow-boats will be found cruising in the lower part of Chesapeake Bay or in Hampton Roads. Vessels sailing up the bay and bound to Baltimore, if of more than 15 feet draught, should take a tow-boat at the entrance of the Craighill or Brewerton channels. Tow-boats will generally be found near the mouth of the Patapsco River waiting to be engaged to tow vessels through the dredged channels.

The Tow-boat Owners Association of Baltimore has regular rates for towage, which they publish in pamphlet form. See, also, "Tow-boats" under heading "Hampton Roads."

Anchorages.—The anchorage limits in the harbor of Baltimore are prescribed by Ordinance No. 61 (see Appendix I), and it is the duty of the harbor master of the first district to carry out the provisions of this ordinance. Vessels can find good anchorage in 22 to 25 feet water on either side of Fort McHenry Channel above Fort Carroll, keeping at least 300 feet outside of the dredged channel marked by buoys. Vessels outward bound usually anchor to the westward of the Fort McHenry Channel and south of Lazaretto Point.

Harbor Regulations for the port of Baltimore are given in Appendix I. The harbor is divided into six districts, each in charge of a harbor master, who has control of the berthing and shifting of vessels, etc., in his district. The limits of the districts are:

1st. East of Jones' Falls.

2d. West of Jones' Falls to Commerce street.

3d. West of Commerce street to east side Bowly Wharf.

† This range is not readily distinguished. See Sailing Directions, section 2, following.

4th. East side Bowley Wharf, including Light and Pratt streets and all wharves on south and west sides of harbor.

5th. City Dock and Jones' Falls.

6th. That part of the harbor known as the South, West, and Middle branches of the Patapsco River.

(See also Appendix I.)

Quarantine Regulations, Port of Baltimore.†—*I.* All vessels arriving from sea between April 30 and November 1 [except from ports in the United States north of Cape Henry] are required to stop at Quarantine Ground, and there await the arrival and orders of the quarantine hospital physician or his assistant.

Any vessel violating this regulation, or any order given by the quarantine hospital physician or his assistant, in conformity therewith, will incur a penalty of $500, and further a penalty of $50 for every hour the said vessel shall remain in any position in violation thereof.

II. Masters, pilots, or other persons having charge of vessels coming to the port of Baltimore, whether from sea or elsewhere, at any and all seasons of the year, on board of which there may be, or may have been, at any time during the voyage, any sickness of an infectious or contagious character, or which would authorize a suspicion that it might be infectious or contagious, are required to stop at Quarantine and there await the arrival of the quarantine hospital physician or his assistant, and shall not leave there without the written permission of said physician or his assistant; and said masters, pilots, and other persons having charge of said vessels are warned not to suffer any person who may be on board, or may come on board before the quarantine officers, to leave said vessels, or any baggage, goods, or other article to be landed or brought on shore from said vessels, until the written permission of the quarantine hospital physician or his assistant shall be first obtained.

Any violation of this regulation will subject the master, pilot, or other person so offending to a fine of $500, and a like penalty will be imposed for any violation of the orders of the quarantine hospital physician or his assistant, given in pursuance thereof, or for any refusal to make full disclosure of all circumstances in relation to the health of the officers, passengers, and crew on board of said vessels at the time of inquiry and during the voyage.

III. Any person who shall go on board, or have communication otherwise than by speaking with the persons on board any vessel brought to or detained at Quarantine, before he or she shall have obtained permission in writing from the quarantine hospital physician or his assistant, shall be fined $20 for each and every offense.

IV. If any person on board such vessel shall leave it and come on shore without the permission of the quarantine hospital physician or his assistant, he or she shall be fined $50.

V. Any person removing or attempting to remove any baggage or merchandise detained at Quarantine under any of the health ordinances of the city of Baltimore, without the permission of the quarantine hospital physician or his assistant, will be fined $20 and all expenses of returning said baggage or merchandise into the charge of said physician or his assistant.

VI. Persons engaged in the act of violating any of the foregoing regulations or orders of the quarantine hospital physician or his assistant, in pursuance thereof, will be subjected to summary arrest, besides incurring the pecuniary penalties named.

VII. N. B.—Masters of vessels are authorized by act of Congress to arrest and hold as prisoners, to be delivered to the proper authorities, any persons who, not being in the United States service or authorized by law, shall come on board their vessels without leave, prior to the actual arrival of said vessels at their port of destination and before they shall be completely moored.

For extracts from Quarantine Laws see Appendix I.

Wind Signals of the **U. S. Signal Service** are displayed from the building No. 2 South Holiday street. These signals can be seen in some parts of the harbor. For a list of Wind Signal Stations see page 22, and for an explanation of the signals and their use see Appendix II.

Wind signals which can be seen from all parts of the harbor are shown from the Marine Observatory at Federal Hill Park.‡

A Time-ball is dropped daily (Sundays excepted) on the Baltimore and Ohio R. R. Office at noon of the 75th meridian, 5 *hours Greenwich mean time.* The dropping of this ball is regulated by the U. S. Naval Observatory, Washington, D. C. It is hoisted five minutes before noon and can be seen from many parts of the harbor; in case of no signal the ball is lowered after 12 hours, 5 minutes P. M.

Wharves.—The deepest draught vessels are berthed at the piers of the B. & O. R. R. at Locust Point and at the N. C. R'y piers at Canton; 24 feet of water can be taken alongside the elevator of the N. C. R'y. east of Lazaretto Point. The other wharves in the harbor have from 15 to 24 feet of water at their outer ends; in the Middle Branch a depth of 15 feet is found at the principal wharves. The facilities for loading and discharging cargoes are of the best, and no difficulty is experienced in berthing the largest vessels.

† Printed in pamphlet form, in three languages, by the order of the Board of Health.

‡ The Observatory is conducted by Marcus L. Dudley, Esq., Exchange Reading Room, Baltimore, Md.

Repairs.—The facilities for repairs to hulls of vessels and machinery of steamers are of the best. There is one dry-dock, two floating docks, and three marine railways capable of taking out vessels of over 500 tons, besides other smaller marine railways. The dimensions of the principal ones are:

Character.	Length (feet).	Breadth (feet).			Draught (feet).	Remarks.
		Entrance.	Top.	Bottom.		
Dry-dock	470	80	115	45	22	Largest single vessel taken, 366 feet long, 42 beam, and 3,603 tons register. Two steamers, 1180 and 1,273 tons respectively, 217 and 200 feet long, were taken at one time.
Floating-dock	210	80			12½	1,500 tons lifting capacity.
" "	141	56				500 " " "
Marine railway	305					1,500 tons capacity.
" "	225	60			13	1,800 " "
" "	234				10	800 " "
" "	126	27			5	200 " "

There are large machine and boiler-shops capable of turning out any kind of work required for the machinery of steamers.

Supplies.—Coal in unlimited quantities can be obtained alongside the wharves or from lighters in the stream. Water can be had alongside wharves or from water-boats. Provisions and ship-chandler's stores of all descriptions can be had in the city.

Tides.—The mean rise and fall of tides is 1.3 feet. For other tidal data see table, page 22.

Ice.—Baltimore Harbor and the Patapsco River are frozen over in severe winters, but steamers and ice-boats keep the dredged channels open so that vessels assisted by steam can always enter the harbor. In severe winters wooden vessels frequently put extra sheathing around their bows to prevent the chafe of drift-ice.

SAILING DIRECTIONS, PATAPSCO RIVER AND BALTIMORE HARBOR.

The directions under Section 1, through Craighill and Cut Off channels, are good for a least depth of 27 feet if the dredged channels are closely followed. By the directions under Section 1 A, through the Brewerton Channel, depths varying from 19 to 27 feet can be carried. The directions under Section 1 B carry a least depth of 14 feet. Only the smaller class of vessels enter the Patapsco River outside of the dredged channels. The directions under Section 2 carry a depth of 27 feet to the city of Baltimore.

1. ***Approaching and Entering by the Craighill and Cut Off channels.—From the Southward.***—Having followed the directions under Section 6, "Sailing Directions, Chesapeake Bay," page 32, when Sandy Point Light-house bears **W.**, distant about ¾ mile, steer **N.** by **W.** ½ **W.**; this course should lead fair for the 1st-class red nun-buoy (No. 2) which marks the southern entrance to the Craighill Channel. Leave red nun-buoy No. 2 on the starboard hand and steer **N.** ¼ **E.** following the line of red buoys which mark the eastern edge of the channel. When Bodkin Point bears about **W NW.** two black can-buoys should be left on the port hand and a red and black horizontal striped spar-buoy on the starboard hand; these buoys mark the entrance to the Cut Off Channel. The course now changes to **N NW.** ½ **W.** and follows the line of black buoys which mark the western edge of the Cut Off Channel. When up to the 1st class black can-buoy No. 17 change the course to **NW.** by **W.** ¾ **W.**, and follow the directions in Section 2 following.

At night.—With Sandy Point Light-house bearing **W.**, distant about ¾ mile, steer **N NW.** until the color of Sandy Point Light is changed from white to red. Keep on the edge of the red rays of this light until the Craighill Channel range-lights are brought in line and then follow the range, course about **N.** ¼ **E.** Standing in on the Craighill Channel range keep a lookout for the Cut Off range-lights, which will be seen to the westward of Seven Foot Knoll Light-house on the port bow. When the Cut Off range-lights are in line steer for them, course **N NW.** ½ **W.** Seven Foot Knoll Light will be left about 500 yards on the starboard hand when half-way along the Cut Off Channel. When a little past Seven Foot Knoll Light a lookout should be kept for Hawkins' Point Light, which should

be seen to the westward and a little south from Fort Carroll Light. (Leading Point Light, the rear light of the Brewerton Channel range, will be opened out.)

When Hawkins' Point Light bears **NW** by **W.** ¾ **W.** head for it on this bearing, keeping Hawkins' Point and Leading Point lights in range, and follow the directions in Section 2 following.

Caution.—Vessels of heavy draught should not attempt to enter at night, even under favorable conditions, on account of the width of the channels, which ranges from 400 to 250 feet.

Note.—It should be remembered that, when approaching the entrance to the Craighill Channel, the Craighill Channel range-lights will be seen to the eastward and the Cut Off Channel range-lights to the westward of Seven Foot Knoll Light-house. (See the characteristics of these lights in the table on page 20.)

Remarks.—The 1st-class red nun-buoy (No. 2.) at the entrance of the Craighill Channel is nearly 3 miles **N.** ½ **W.** from Sandy Point Light-house and off the mouth of Magothy River. As soon as this buoy is made it should be steered for and left on the starboard hand. The red buoys on the eastern edge of Craighill Channel are spars. To the westward several black buoys are seen, which mark shoal spots lying outside the channel; these should not be mistaken for the buoys of the Cut Off Channel. Standing up the Craighill Channel the range-lights (see table, page 20) will be ahead and **Seven Foot Knoll Light-house** on the port bow; to the westward of the latter the front range light-house of the **Cut Off Channel range** † will be seen on the southwestern end of North Point (see table, page 20). As the entrance of the Cut Off Channel is approached, the two black can-buoys will be seen, and, in a northwesterly direction, the black spar-buoys marking the western edge of the Cut Off Channel. When entering the Cut Off Channel a red and black horizontal striped spar-buoy, marking the junction of the Craighill and Cut Off channels, will be left on the starboard hand.

Standing up the Cut Off Channel the two range-lights (see table, page 20) will be ahead; Seven Foot Knoll Light-house will be on the starboard bow and left 500 yards on the starboard hand while it is being passed; Fort Carroll and light-house, Hawkins' Point Light-house, and the village at Steelton will be seen to the westward, and some of the larger buildings of the city of Baltimore will be seen on a clear day. After passing Seven Foot Knoll Light-house the 1st-class black can-buoy (No. 17), marking the turning point into Brewerton Channel, will be made, and should be left close on the port hand; the red and black horizontal striped spar-buoy which will be seen on the eastern side of the channel will be left on the starboard hand. A long line of red spar-buoys, marking the northern edge of Brewerton channel, will be seen stretching to the southeastward and northwestward from the head of the Cut Off Channel.

Dangers.—**Lower Thirteen Foot Lump** is on the western side of the dredged channel, about 1¾ miles above red nun-buoy No. 2, and has 13 feet of water over it as indicated by its name. A buoy (can, black, No. 1) marks this spot, which should be left on the port hand; this buoy should not be mistaken for the buoy marking the entrance of the Cut Off Channel, which is nearly 2½ miles farther to the northward.

There are numerous lumps on both sides of the Craighill and Cut Off channels which have from 8 to 13 feet of water over them; they are of a shifting nature and a detailed description of them would be useless; some are marked by buoys. Vessels entering should keep in the dredged channels; some local knowledge is necessary for vessels of 7 feet draught to enter from the southward outside of the dredged channels.

Shoals with 1 to 6 feet of water over them make out to the eastward and northeastward from Bodkin Point for a distance of ⅞ mile.

1 A. ***Approaching and Entering by the Brewerton Channel.—From the Southward.***—Having followed the directions under Section 6, "Sailing Directions, Chesapeake Bay," page 32, leave Sandy Point Light-house ¾ mile on the port hand and continue the **N.** by **E.** ¾ **E.** course about 4½ miles farther, until Love Point Light-house bears **SE.** ¾ **E.**, distant 3 miles; Lower Mid-channel buoy (spar, white and black perpendicular stripes) will then be close aboard. Then change the course to **N.** ¾ **E.** and continue this course 3¾ miles until Seven Foot Knoll Light-house bears **W.** by **N.** and red spar-buoy No. 2 is close aboard. Then steer **NW.** by **W.** ¾ **W.**, leaving red spar-buoy, No. 2, about 50 yards on the starboard hand, and follow the red spar-buoys which mark the northern edge of the channel. Continue the **NW.** by **W.** ¾ **W.** course for 4¾ miles, which will lead to the junction of the Brewerton and Cut Off channels, and then follow the directions in Section 2 following.

Note.—A stranger should not attempt this channel at night, as some difficulty may be experienced in distinguishing the range-lights.

Remarks.—On the **N.** by **E.** ¾ **E.** course Chester River entrance will be opened out on the eastern shore and the Lower Mid-channel buoy (spar, white and black perpendicular stripes) should be made ahead. On a clear day some of the Craighill Channel buoys may be seen off the port beam. The course leads nearly in the middle of the bay and well clear of the shoals off the mouth of the Patapsco River. On the **N.** ¾ **E.** course from the Lower Mid-channel buoy the Upper Mid-channel buoy (spar, white and black perpendicular stripes) will be left about ¼ mile on the starboard hand and Swan's Point Shoal buoy (spar, red, No. 22) will be left about ¾ mile on the starboard hand. Brewerton Channel Entrance buoy (spar, red, No. 2) should be made a little on the port bow.

† At night the electric lights on Sparrow Point (Steelton), which can be distinguished by their white color and are visible from all points, should not be mistaken for the Cut Off Channel range-lights which are visible only when on or nearly on the range.

When turning to stand into Brewerton Channel, the range light-houses of the Craighill and Cut Off channels will be on the starboard bow and Seven Foot Knoll Light-house on the port bow. The red buoys marking the northern edge of the Brewerton Channel are spars.

Dangers.—**Shoals**, with 17 feet of water near the end, make out 1¼ miles in a northwesterly direction from **Love Point** (the southern point of entrance to Chester River); these shoals are not marked.

Numerous shoal spots, some of them with as little as 6 and 8 feet of water over them, lie to the westward of the sailing lines and off the entrance to the Patapsco River. **Belvidere Shoal**, 8 feet of water, lies 5 miles **N.** ⅓ **E.** from Sandy Point Light-house and is marked by a buoy (spar, black, No. 27). **Nine Foot Knoll**, 8 feet of water, lies 2¼ miles **E SE.** ¼ **E.** from Seven Foot Knoll Light-house and is marked by a buoy (spar, black, No. 1). **Six Foot Knoll**, 6 feet of water, lies to the westward of Nine Foot Knoll and is marked by a buoy (spar, black, No. 3). There are several spots with 12 feet of water to the westward of the sailing line and to the eastward of a line between Belvidere and Nine Foot Knoll buoys.

Swan's Point Shoal extends a little over 1⅝ miles **W SW.** from Swan's Point; its western end is marked by a buoy (spar, red, No. 22).

Between the entrance buoy (spar, red, No. 2) and the junction of the Craighill Channel there are lumps on both sides of the channel with depths of from 15 to 17 feet, with deeper water around them.

Seven Foot Knoll, 6 to 10 feet of water, extends nearly ⅜ mile **NE.** by **E.** from the light-house; the western edge of the knoll borders on the Cut Off Channel.

1 B. ***Approaching and Entering around North Point.—From the Northward.***—These directions, if closely followed, will carry a least depth of 14 feet.

Standing down the bay after having passed Mitchell's Bluff, continue in the channel until the front light-house of the Craighill Channel range bears **W.** ¼ **N.**; steer for the light-house on this bearing, and after having stood on this course about 3 miles and the light is 2¼ miles distant ahead, haul to the northward so as to leave it about 500 yards on the port hand. When abreast of the light steer **W.** by **S.** until the Brewerton Channel buoys are reached, when follow the directions in Section 2.

Currents.—The flood current sets to the northward and the ebb to southward across the shoal which extends to the eastward from the front light-house of the Craighill Channel range. In approaching the light-house allowance should be made for the current, which varies in strength with the force and direction of the wind.

Remarks.—On the **W.** ¼ **N.** course, heading for the front light-house of the Craighill Channel range (see table, page 20), North Point will be a little on the starboard bow and the rear light-house of the Craighill Channel range will be broad off the starboard bow. The **W.** by **S.** course leads about ⅞ mile to the southward of North Point and clears the shoal which makes to the southward from it.

Dangers.—**A large shoal**, with a least depth of 6 to 9 feet of water over it, lies to the northward of the sailing line near the main channel; the southern end of this shoal is 5¾ miles **S.** by **W.** ¾ **W.** from Pool's Island Light-house.

A long narrow shoal, with a least depth of 4 feet over it, makes off 2 miles in an **E.** by **S.** direction from the front light-house of the Craighill Channel range. This shoal is avoided by hauling to the northward when approaching the light-house on the **W.** ¼ **N.** course.

North Point Shoal extends out about ⅝ mile to the southward from North Point; it has 1 to 7 feet of water over it, and is marked off its southern end by a buoy (spar, red and black horizontal stripes).

2. ***From North Point to Lazaretto Point, by the Brewerton and Fort McHenry channels.***—When in the Brewerton Channel continue the **NW.** by **W.** ¾ **W.** course, following the line of red buoys with Hawkins' Point Light-house ahead. When within 1⅛ miles of Hawkins' Point Light-house and abreast of black spar-buoy No. 11, which is left on the port hand, change the course to **NW.** by **N.**, and continue to follow the line of red buoys which mark the eastern side of the Fort McHenry Channel up to Lazaretto Point.

If bound into the harbor above Lazaretto Point, take a tow-boat.

If of less than 23 feet draught and desiring to anchor, come to in 24 to 25 feet of water at least 300 feet to the westward of the dredged channel when on a line between the Northern Central Railway elevator and the Marine Hospital, with the former bearing about **NE.** by **E.** *Or vessels of 19 feet or less draught*, when the southern end of the Northern Central elevator bears about **N.** by **E.** ½ **E.**, can steer **NW.** by **W.** and anchor, in the natural channel of the river, with the flag-staff on Fort McHenry bearing between **N.** and **NE.**

Note.—The rear light of the Brewerton Channel range (**Leading Point Light-house**, see table, page 20) is not readily distinguished in the daytime until past the junction of the Cut Off Channel, and at night the light is shut out when near the junction of the Brewerton and Fort McHenry channels.

Remarks.—Standing up the Brewerton Channel above North Point, Old Road Bay and North Point and Welshman's creeks will be opened to the westward of North Point. The entrance to Rock Creek will be opened in

the south shore; when abreast of Steelton, Stony Creek will be opened in the south shore. On the southeastern side of Sparrow's Point (Steelton) is a large wharf; a dredged channel, marked by buoys, leads from Brewerton Channel to this wharf. At night Steelton is lighted by electric lights. Standing up the Fort McHenry Channel below Fort Carroll, Bear Creek is open to the westward of Steelton. Passing Fort Carroll, Curtis' Creek will be gradually opened to the westward. **The Quarantine Anchorage** is between Curtis Creek entrance and Hawkins' Point, and several yellow buoys, which mark the anchorage, are left on the port hand. The large elevators of the B. & O. R. R. are prominent ahead, with the grassy slopes of the batteries at Fort McHenry in the foreground. **Lazaretto Point** and light-house are a little on the starboard bow; between it and Fort McHenry is the entrance to the harbor. The Patapsco River above Fort McHenry, known locally as "The **Southern Branch**," is opened out when about 1 mile from Lazaretto Point.

Dangers.—There are no dangers in the dredged channels; the depth outside of the Brewerton Channel above North Point ranges from 15 to 17 feet. Along the Fort McHenry Channel the depth outside of the dredged channel is from 20 to 24 feet.

Rock Point Shoal has 5 to 12 feet of water over it, and extends $\frac{5}{8}$ mile to the northward from Rock Point. The northern edge of the shoal is marked by a buoy (spar, black, No. 9), which bears about **SW.**, distant $1\frac{3}{8}$ miles from the front light-house of the Cut Off range.

A rock with $\frac{1}{2}$ foot water over it, and marked by a buoy (spar, red and black horizontal stripes), lies in the middle of Old Road Bay on a line between North and Sparrow's points.

A wreck, marked by a red and black horizontal striped spar-buoy, lies $1\frac{5}{8}$ miles **W NW. ½ W.** from the front light of the Cut Off Channel range.

A shoal, with 10 feet of water near its end, extends $\frac{5}{8}$ mile to the southward and about the same distance to the westward from Sparrow's Point. This shoal is not marked, and vessels should not stand to the northward of the line of the red buoys when passing the point.

A spot with 8 feet of water over it, and marked by a buoy (spar, red, No. 2), lies about $1\frac{1}{2}$ miles miles **NW.** by **W.** from Rock Point and about $\frac{1}{2}$ mile from the shore.

A shoal with 6 feet of water over it makes out nearly $\frac{3}{4}$ mile to the southward from **Soller's Point**, the western point of entrance to Bear Creek, leaving a narrow channel to the northward of Fort Carroll with a depth of 15 feet. Strangers should pass to the southward of Fort Carroll.

The eastern shore of the river above Fort Carroll should be given a berth of $\frac{1}{2}$ mile.

Fishing Point Shoal makes out nearly $\frac{1}{2}$ mile to the eastward from the northern point of entrance to Curtis' Creek; the eastern edge of this shoal is marked by a buoy (spar, black, No. 15).

Fort McHenry Shoal extends to the southward from the point at Fort McHenry and has 17 feet of water on its end and 5 feet of water 200 yards from shore. Two buoys (spar, black, Nos. 17 and 19) mark the southeastern and eastern edge of this shoal.

EASTERN SHORE OF CHESAPEAKE BAY FROM CAPE CHARLES TO POKOMOKE SOUND†

This stretch of shore, about 43 miles in length, includes many creeks that are navigable for small vessels. It borders a fertile, agricultural country, and the transportation of farm produce employs many small sailing vessels and some of the steamers engaged in the bay trade. The creeks have many landings from which this produce is shipped. The shore is low and without any prominent natural landmarks except **Butler's Bluff**, which is about midway between Cape Charles and Old Plantation Flats Light-house, and shows bare, bluff faces when seen from the bay. On **Fisherman's Island**, just south of Cape Charles, are two small buildings belonging to the **U. S. Quarantine Station**. Other buildings are to be erected and a wharf is to be built. **Old Plantation Flats** and **Cherrystone light-houses** (see table, page 16) are the principal aids.

Shoals extend out $\frac{1}{2}$ mile to 3 miles from the shore, and across the mouths of the creeks, where they form bars. The channels across the bars of the more important creeks are marked by buoys.

Strangers desiring to enter any of the creeks are advised to take a pilot (generally an oysterman or fisherman living in the vicinity).

FISHERMAN'S INLET

is a narrow channel between Fisherman's Island and Cape Charles and is only used by small vessels. The channel is narrow, crooked, and has a depth of $7\frac{1}{2}$ feet, but is without aids to assist a stranger. The tidal currents are very strong; their velocity to the westward is about $3\frac{1}{2}$ knots.

OLD PLANTATION CREEK

is a shallow, unimportant stream about $7\frac{1}{2}$ miles above Cape Charles; its entrance lies east from Old Plantation Flats Light-house.

CHERRYSTONE INLET ‡

is a narrow channel leading into a shallow creek in the eastern shore about $4\frac{1}{2}$ miles above Old Plantation Flats Light-house. This channel is marked by Cherrystone Light-house, two range-lights (see table, page 16), and a number of buoys; it is the approach to Cape Charles City and to Cherrytsone Wharf, a landing about $3\frac{1}{2}$ miles above

† Shown in parts on Coast and Geodetic Survey charts **131, 132, 133**, scale of each $\frac{1}{80,000}$, price of each $0.50.

‡ Shown on Coast and Geodetic Survey chart **132**, scale $\frac{1}{80,000}$, price $0.50.

the light-house. The least depth in the channel to Cape Charles City is 10 feet and to Cherrystone Wharf 9 feet. Between Cherrystone Light-house and Wescott's Point the inlet is exposed to northerly and westerly winds but the shoals and Cherrystone Island somewhat break the sea.

Cape Charles City, on the eastern shore, **NE.** from Cherrystone Light-house, is the terminus of the N. Y., Phila. & Norfolk R. R. which has a dredged basin with a depth of 11 feet for the steamers plying to Norfolk. This basin is reached through a dredged channel marked by piles, which extend out from the shore to the channel of the inlet; a pile-beacon marks each side of the entrance to this channel, the northern one having a light. Though this basin is private property, a number of small vessels seek refuge in it from sudden westerly gales, taking care, however, to anchor so as not to interfere with the passage of the steamers, tugs, and barges of the R. R. Co.

King's Creek, a narrow shallow stream, only navigable for small craft, empties into Cherrystone Inlet just to the northward of Cape Charles City.

Cherrystone Wharf is a long wharf and small village on the eastern shore, about 2½ miles above Cape Charles City. Small steamers of the Old Dominion line, running from Norfolk, make this one of their landings.

The deepest draught of vessels engaged in the carrying trade from Cape Charles City is 10 feet, and from Cherrystone Wharf 8 feet. Strangers entering the inlet sometimes take a pilot, lying off and on to the southwestward of Cherrystone Light-house, with signal set, until one comes off from the shore. Bituminous coal in small quantities, for steamers, and water, through pipe and hose, can be had at the wharf in Cape Charles City; provisions can be obtained in the town. There is no danger from ice in the winter. The tidal currents set across the entrance to the channel south of Cherrystone Light-house but follow the general direction of the channel above the light-house. The mean rise and fall of tides is 2.5 feet.

GENERAL DIRECTIONS FOR ENTERING CHERRYSTONE INLET.

These directions are good for a draught of 10 feet or less, and lead up to the entrance of the dredged channel into the basin.

Approach Old Plantation Flats Light-house on any course between **N.** by **E.** through **E.** to **S SE.** and pass to the northward of the light-house, giving it a berth of ½ mile. Bring Old Plantation Flats Light-house to bear **S.**, distant ½ mile and steer **NE. ½ N.**, which will lead upon the range and fair between black can-buoy No. 1 and red nun-buoy No. 4. Make allowance for the tide which sets across the channel with considerable velocity at times. When the stake-light on the north beacon bears **N. ½ E.**, steer for it on this bearing, and leave the black buoy (spar, No. 3) about 75 yards on the port beam. Leave the beacons on the starboard hand and anchor in the channel to the northward of them, in 18 feet water.

If bound up to Cherrystone Wharf, the buoys should be closely followed.

Remarks.—**Cherrystone Light-house** should receive a berth of at least 1¼ miles while to the westward of it. The water shoals abruptly on both sides of the channel above black can-buoy No. 1. Vessels bound into the basin should enter the dredged channel slowly, as there are usually a number of small vessels at anchor inside. The range-beacons do not show very distinctly in the daytime; the rear light is the higher of the two.

HUNGERS CREEK †

is 9 miles above Cherrystone Light-house, and is entered through a narrow buoyed channel which commences about 3 miles below the mouth of the creek. This channel leads to the northward on the eastern side of a long shoal, which extends along the shore with 1 foot of water over it. The entrance buoy to this channel (nun, red, No. 2) is 6 miles to the northward of Cherrystone Light-house. There is 6 feet of water on the bar at low water, but a stranger should not enter without a pilot.

Mattawoman Creek, at the mouth of Hungers Creek, is shallow and of no importance. Sailing directions of practical use cannot be given; the chart is the best guide for approaching.

NASWADDOX CREEK †

empties into the eastern side of Chesapeake Bay 13 miles above Cherrystone Light-house and 11¼ miles **E NE. ¼ E.** from Wolf Trap Light-house. A bar, with 3 to 4 feet of water over it, extends across the mouth of the creek. **Glebe Farm** and **Merton**, two landings on the creek, ship farm produce in vessels of 5 feet or less draught engaged in the trade. Strangers seldom enter the creek. Pilots, generally local fishermen, can be had by making signal off the entrance.

OCCOHANNOCK CREEK †

empties into the eastern side of Chesapeake Bay about 18 miles to the northward of Cherrystone Light-house and 14 miles **E SE. ¾ E.** from Windmill Point Light-house. The mouth of the creek is obstructed by extensive shoals, which make out 1¼ miles from the shore. Two buoyed channels with a depth of 5 feet at low water lead into the entrance across these shoals. The South Channel entrance buoy (spar, black, No. 1) is 3½ miles below the mouth of the creek, the channel leading to the northward from the buoy. The North Channel entrance buoy (can, black

† Shown on Coast and Geodetic Survey chart 133, scale $\frac{1}{80,000}$, price $0.50.

No. 1) lies west of the mouth of the creek and about 1¼ miles off shore. The deepest draught taken into the creek at high water is 6 feet, and 5 feet can be taken up to **Rew's Wharf**, which is considered the head of navigation. The several landings on the creek ship farm produce and oysters in small sailing vessels and the steamers of the Eastern Shore Steamboat Co. Strangers seldom enter except with the assistance of a pilot, usually a fisherman living at the mouth of the creek.

Sailing directions of practical use to a stranger cannot be given; the buoys are the only aids into the entrance of the creek, and above them some local knowledge is necessary to keep in the channel.

Craddock Creek is a small, shallow estuary about midway between the mouths of Occohannock and Nandua creeks. It has extensive shoals lying off the entrance and is navigable only for very small craft.

NANDUA CREEK †

empties into the eastern side of Chesapeake Bay about 23 miles to the northward of Cherrystone Light-house. A buoyed channel with 6 feet at low water leads across the shoals off the entrance into the mouth of the creek. The deepest draught vessels entering the creek is 7 feet; this draught can be taken up to Nandua.

Nandua, a village on the creek, has some trade in farm produce carried in sailing vessels, and steamers of the Eastern Shore Steamboat Co. Strangers seldom enter. **Pilots** can be obtained by lying off and on outside of the buoys with signal set, until one comes off from shore. The channel inside the mouth of the creek is fairly marked by the shoals which rise abruptly on both sides and have but little water over them at low water.

PONGOTEAGUE CREEK †

empties into the eastern side of Chesapeake Bay about 29 miles above Old Plantation Flats Light-house and about 6½ miles to the southward of Watt's Island Light-house. The entrance is obstructed by shoals, over which a buoyed channel leads into the creek to the landings on its shores. The depth of water in the channel is 10 feet. **Bogg's Wharf**, about 2½ miles above the mouth, can be reached by vessels of 7 feet draught. Farm produce is shipped from the landings; it is carried in small sailing vessels and the steamers of the Eastern Shore Steamboat Co.

Sailing directions of practical value cannot be given; the chart and buoys are the best guides, but a stranger should not enter without a pilot.

ONANCOCK CREEK ‡

empties into the eastern side of Chesapeake Bay about 31 miles above Old Plantation Flats Light-house and 4½ miles **SE.** by **S.** from Watt's Island Light-house. The entrance is obstructed by a bar through which a channel 100 feet wide and 8 feet deep at low water was dredged in 1880 under the supervision of the U. S. engineers. This channel is marked by buoys, the outer one bearing **S SE.**, distant 3½ miles from Watt's Island Light-house.

The northern point at entrance is low and shows a bare sand beach backed by trees; the southern point is wooded.

Onancock, a village at the head of navigation nearly 5 miles above the mouth of the creek, has considerable trade in farm produce and lumber carried in small vessels engaged in the bay trade and in steamers of the Eastern Shore Steamboat Co. The deepest draught entering and bound up to Onancock is 7 feet; this draught is taken in by the steamers and larger sailing vessels.

Strangers entering should take a pilot, as there are no marks, except those known to local pilots, to assist in keeping a vessel in the channel above the mouth of the creek. **Pilots** can be had by making signal outside the bar, coming to anchor near the entrance buoy, or standing off and on until boarded by one. Fresh water through pipe and hose and provisions and ship-chandler's stores can be had at Onancock.

General Directions for approaching Onancock Creek.—Bring Watt's Island Light-house to bear **N NE.**, distant 2½ miles, and steer **E SE. ½ E.** until up to the entrance buoy (nun, white and black perpendicular stripes); anchor just to the northward of this buoy, or lay off and on until a pilot is obtained.

CHESCONESSEX CREEK §

empties into the eastern side of the bay at the entrance to Pokomoke Sound and about 4½ miles **E SE.** from Watt's Island Light-house. When fair off the entrance of the creek the southern point at entrance will appear as a long, low point with several small buildings; a little farther to the southward is a noticable detached group of trees with bushy tops. The channel leading between shoals off the entrance is marked by buoys and has a depth of 15 feet into the mouth of the creek, but above this it shoals gradually to a depth of 7 feet, which depth can be taken nearly 2 miles above its mouth. Farm produce is shipped from the landing in vessels engaged in the bay trade. Strangers seldom enter the creek; they should take a pilot, as there are no aids above its mouth to assist a stranger.

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† Shown on Coast and Geodetic Survey chart **132**, scale $\frac{1}{80,000}$, price $0.50.

‡ Shown in part on Coast and Geodetic Survey charts **132, 133**, scale of each $\frac{1}{80,000}$, price of each $0.50.

§ Shown on Coast and Geodetic Survey chart **133**, scale $\frac{1}{80,000}$, price $0.50.

GENERAL DIRECTIONS—OLD PLANTATION LIGHT-HOUSE TO POKOMOKE SOUND ENTRANCE.

The following directions are good for vessels drawing 9 feet or less, bound into Pokomoke Sound, or to any of the numerous creeks indenting the eastern shore.

Having entered Chesapeake Bay as directed on pages 25–28, or, coming from Hampton Roads, bring Old Plantation Light-house to bear **E.**, distant about 1¾ miles. There should then be 6 to 7 fathoms of water and the course along the eastern shore is **N.** by **E.** ½ **E.** This made good for 32½ miles leads up to black buoy No. 1, at the entrance to Pokomoke Sound, and along the eastern shore at an average distance of 2 miles from the beach. The shoaling along this stretch of the eastern shore is irregular and in many places very abrupt, and vessels of more than 9 feet draught should keep farther off shore than the course given above would lead. Vessels of more than 9 feet draught would not enter any of the creeks and would therefore have nothing to gain by hugging the shore.

If the course **N.** by **E.** ½ **E.** is made good the mouths of many of the creeks will be visible and some of the buoys at the entrance to the channels leading to the mouths will be seen.

The shore-line presents no well-marked natural features that can be easily recognized by, or are of practical value to a stranger navigating along it.

If desiring to enter any of the numerous creeks, take a pilot off the entrance or be guided by the aids and chart; consult the descriptions already given of the creeks and channels leading into them

POKOMOKE SOUND †

is an estuary of Chesapeake Bay making into the eastern shore about 43 miles above Cape Charles; it is separated from Tangier Sound by several islands and large shoals, which extend about 10 miles to the southward from the mainland and are marked near their southern end by Watt's Island Light-house. The sound is about 13 miles long in a **NE.** by **N.** and **SW.** by **S.** direction and about 9 miles wide at its widest part. Large flats occupy almost the whole of it, leaving only comparatively narrow channels into Pokomoke River, at its head, and the numerous creeks which indent its eastern shore. Large oyster-beds cover the bottom, where the depth ranges from 6 to 18 feet. **Watt's Island Light-house** (see table, page 18) marks the western side of entrance, and buoys are placed on the ends of the most prominent shoals to mark the channel up to the mouth of the Pokomoke River. There are no natural aids, the shores bordering the sound being low and marshy, backed by cultivated fields and woods.

Strangers seldom enter Pokomoke Sound or its tributaries. The deepest draught of vessels entering is 9 feet, but only 7 feet can be taken into Pokomoke River or any of the tributaries of the sound.

DEEP CREEK,

a shallow creek of little importance, is in the southeastern side of Pokomoke Sound; it is reached through a narrow and crooked channel which leads between shoals that are not marked. A draught of 7 feet can be taken up to the mouth of the creek, but the creek itself only has 3 to 5 feet of water.

HUNTING CREEK

empties into the southeastern side of Pokomoke Sound to the eastward of Deep Creek. A channel marked by three buoys leads from the deep water of the sound to the entrance. The landings on the creek have considerable trade in farm produce, oysters, and wood. The deepest draught taken in is 7 feet; this draught can be taken about 2 miles above its mouth.

Strangers should not enter without a pilot, as there are none but local aids above the mouth of the creek and the channel is quite narrow.

GUILFORD CREEK

is a broad, shallow creek, with several branches, on the eastern side of the sound about 2½ miles **NE.** from the entrance of Hunting Creek. A draught of 7 feet can be taken into the creek and 4 to 6 feet into the branches. The same buoyed channel that leads into Hunting Creek leads part of the way to the entrance of Guilford Creek. Only vessels well acquainted with the locality enter; strangers should take a pilot off Watt's Island Light-house.

MESSONGO CREEK

is a shallow creek in the eastern shore of the sound, north of Guilford Creek and south of the mouth of Pokomoke River. An unbuoyed channel with a depth of 8 feet leads between shoals, from the deep water of the sound to the mouth of the creek. Above its mouth several buoys are placed to mark the channel to the landing. Strangers should not enter this creek without a pilot.

POKOMOKE RIVER

empties into the head of Pokomoke Sound, and is the approach to several villages and landings which have a large trade in farm produce, lumber, and cordwood. Just inside the mouth of the river, where it is 1 to 1½ miles wide, are extensive shoals called the "The Muds," which have 4 to 5 feet of water over them, but the bottom is so soft that

† Shown on Coast and Geodetic Survey charts: 133, scale $\frac{1}{80,000}$, price $0.50; 376, scale $\frac{1}{400,000}$, price $0.50.

vessels with a good breeze work into the river with their keels 1 foot in the mud. Above the mouth the principal obstructions (trees, stumps, and sharp bends) have been removed, and the channel improved under the supervision of the U. S. engineers. At present (1890), a draught of 7 feet can be taken up to **Snow Hill**, the head of navigation on the river, 28 miles above its mouth.

Strangers seldom enter; the channel above Shelltown is narrow and crooked and requires local knowledge and a fair wind for its navigation.

Shelltown is a small village and landing on the west bank of the river, about 5 miles above its mouth.

Rehoboth, on the west bank of the river, about 12 miles above its mouth, is a small village and landing.

Newtown or Pokomoke City, a town on the east bank of the river, about 19 miles above its mouth, has several saw and flour-mills and two marine railways for taking out vessels that trade on the river and in the sound. The deepest draught vessels trading to Newtown is 7 feet.

Snow Hill is a village on the east bank of the river, at the head of navigation, about 28 miles above its mouth. It has considerable trade in farm produce and general merchandise, carried in sailing vessels and the steamers of the Eastern Shore Steamboat Co. The deepest draught taken up to Snow Hill is 7 feet.

Freshets are not dangerous; they raise the river from 1 to 5 feet at Snow Hill.

The mean rise and fall of tides is about 2.6 feet at the entrance of the river. The direction and force of the wind has considerable influence on the tides.

GENERAL DIRECTIONS—POKOMOKE SOUND.

1. ***Approaching and Entering.—From the Southward.***—If drawing 9 feet or less, follow the directions on page 18. If drawing more than 9 feet, pass $2\frac{1}{2}$ to 3 miles to the westward of Old Plantation Light-house and steer **N.** by **E.** $\frac{1}{2}$ **E.**

When Watt's Island Light-house (see table, page 18) is made steer for it, course **N NE.** $\frac{1}{2}$ **E.**, and when about $2\frac{3}{4}$ miles from the light-house haul to the eastward, so as to pass $1\frac{1}{2}$ to $2\frac{1}{2}$ miles to the southward of it and about $\frac{1}{2}$ mile to the southward of Little Watt's Island Shoal buoy (spar, black, No. 1); then be guided by the directions in Section 2 following.

Remarks.—Watt's Island Light-house (see table, page 18) should be made bearing between **N NE.** and **NE.** by **N.**, and to the northward of it Watt's Island (long, narrow, and low) will be seen. On the south side of the entrance the land, if seen, will appear low and very broken, as there are a number of small islands lying off the mainland to to the northward of the entrance to Pongateague Creek.

Dangers.—**Extensive shoals** make out in all directions from Watt's Island but their edge, bordering on the channel into Pokomoke Sound, is marked by three black spar-buoys which are numbered 1, 3, and 5, and bear as follows from Watt's Island Light-house: No. 1, $2\frac{1}{4}$ miles **SW.** $\frac{3}{4}$ **S.**; No. 3, about 1 mile **SE.** $\frac{1}{4}$ **S.**; No. 5, $3\frac{1}{4}$ miles **NE.** $\frac{1}{4}$ **E.**

On the south side of the entrance to Pokomoke Sound shoals extend out from the mainland to a distance of 3 to 4 miles, leaving the channel into the sound about $1\frac{1}{4}$ miles in width.

1 A. ***Approaching and Entering.—From the Northward.***—Coming down the bay, pass from 1 to 4 miles to the eastward of Smith's Point Light-house (see table, page 18) and steer **S.** until it bears **N NW.** $\frac{1}{2}$ **W.**, then bring it over the stern and steer **S SE.** $\frac{1}{2}$ **E.** On this course Tangier Island Shoal buoy (nun, red, No. 10) should be made a little on the port bow; pass $\frac{1}{4}$ to $\frac{3}{4}$ mile to the southward of it and steer **E SE.** $\frac{1}{2}$ **E.** This course made good for about $4\frac{1}{2}$ miles will lead $\frac{1}{2}$ to 1 mile to the southward of Tangier Island Flats buoy (spar, black, No. 1), and made good 4 miles farther will lead $\frac{1}{4}$ to $\frac{3}{4}$ mile to the southward of Little Watt's Island Shoal buoy (spar, black, No. 1) at the entrance to Pokomoke Sound, leaving Tangier Sound Light-house 2 miles on the port hand.

The above directions are good for vessels of 12 feet draught or less; vessels of greater draught should steer a more southerly course from Tangier Island Shoal buoy (nun, red, No. 10), but such vessels do not enter Pokomoke Sound. Allowance should be made for the tidal currents; the flood sets to the northward and ebb to the southward.

To proceed up the sound to Pokomoke River entrance be guided by the directions in Section 2 following.

Remarks.—**Tangier Island** (low, ragged, and without prominent distinguishing features) will be seen on the port hand. From its shore extensive shoals make out in all directions. On the **S SE.** $\frac{1}{4}$ **E.** course Tangier Island Shoal buoy should be on the port beam when Tangier Sound Light bears **E.** **Watt's Island Light-house** (see table, page 18), to the southward of Watt's Island, will be made on the port bow.

2. ***From Pokomoke Sound Entrance to Pokomoke River Entrance.***—Having *Little Watt's Island Shoal buoy* (spar, black, No. 1), bearing **N.**, distant about $\frac{1}{2}$ mile, steer **E NE.** about $2\frac{1}{4}$ miles. *Little Watt's Island* (southeast) *Shoal buoy* (spar, black, No. 3) will be made on the port bow; when it is about $\frac{1}{2}$ mile on the port beam, change the course to **NE.** $\frac{3}{4}$ **N.** and continue for

about 3 miles; *Beach Island Shoal buoy* (spar, red, No. 2), to the westward of Beach Island, will then be about ¼ mile on the starboard hand. Now steer **N NE.** about 1 mile, and leave *Upper Watt's Island Shoal buoy* (spar, black, No. 5) about ⅜ mile on the port hand. When the latter buoy bears abeam about ⅜ mile distant, steer **N. by E.** about 3¾ miles. On this course *Tunnel Island Spit buoy* (spar, red, No. 4) will be left ¼ mile on starboard hand. When this buoy bears abeam, distant about ¼ mile, steer **NE. ½ N.** This course leads close to the southward of Broad Creek buoy (spar, black, No. 7). Vessels going higher should take a pilot unless familiar with the channel up the river.

Having entered Pokomoke Sound and brought Little Watt's Island Shoal buoy (black, No. 1) to bear **N.**, distant ½ mile,—*If bound to Onancock Creek* steer **E SE.** for 2¾ miles; *if bound to Chescomessex Creek* steer **E NE. ⅞ E.** for 3½ miles. These courses made good will lead to the entrance buoys, where a pilot should be taken if going up the creeks.

Remarks.—In going up Pokomoke Sound or entering its tributaries vessels must be guided mainly by the buoys, as the land is low and the shore-line very broken and without marked natural features that might be of use to a stranger. A stranger entering the sound may anchor, in 3¼ to 11 fathoms of water, 1½ to 3¼ miles to the southward of Watt's Island Light-house, and there get a pilot for the sound or its tributaries.

TANGIER SOUND. †

This sound, on the eastern side of Chesapeake Bay with its southern entrance about 40 miles above Cape Charles, lies between the mainland of the eastern shore and several large islands which extend in a general north and south direction. The sound is about 27 miles long north and south, and has an average width of about 4 miles; it is noted for large oyster-beds which nearly cover that portion of the bottom, which has a depth of 6 to 18 feet of water over it.

There are three principal entrances; the southern entrance, between Watt's Island Light-house on the east and Tangier Sound Light-house on the west, has the best water and greatest width. The middle entrance (**Kedge's Straits**), between Smith's Island on the south and South Marsh on the north, is abreast the mouth of the Potomac River and leads into the sound from the westward. The northern entrance (**Hooper's Straits**) leads from the westward, near the entrance to Honga River, into the northern end of the sound.

The shores are low, generally flat, and in some parts marshy, presenting few marked natural features. Extensive shoals and oyster-beds (with channels between them leading into the tributaries of the sound) extend off from the land on both sides. **Watt's Island, Little Fox Island,** and **Great Fox Island** extend in a north and south direction on the eastern side of the southern entrance and separate Tangier Sound from Pokomoke Sound; the openings between these islands are very shallow and can only be used by small boats.

The chief tributaries are Little Annemessex, Big Annemessex, and Manokin rivers, Monie Bay, Wicomico and Nanticoke rivers, and Fishing Bay. These are the approaches to several towns and villages which have a large trade in farm produce, oysters, wood, lumber, and general merchandise. The deepest draught of vessels entering the sound is 13 feet, but the carrying is done principally in vessels owned in the bay and of less than 9 feet draught.

In the daytime, in clear weather, the navigation of the sound is rendered comparatively easy by the light-houses and buoys which mark the most prominent dangers. In the tributaries local knowledge or a pilot is necessary. **Tow-boats** are seldom used except on occasions when ice interferes with the passage of the oyster boats to Baltimore, or during the fruit season when the wind is contrary; vessels then engage tow-boats, usually from Baltimore. There are no regular tow-boats engaged in towing vessels in the sound.

The general direction of the **tidal currents** is north and south, following the channel and diverging slightly off the entrances of the tributaries and straits. Their velocity is greatly influenced by the force and direction of the wind.

LITTLE ANNEMESSEX RIVER

empties into the eastern side of the sound 4 miles above Watt's Island Light-house. The entrance, marked by **Jane's Island Light-house** (see table, page 18), is about ¾ mile wide, but the channel, which has been improved by dredging, is only 266 to 425 feet wide up to the town of Crisfield. The shores of the river are low, flat marshes, covered with coarse grass; about 2 miles above its mouth the houses of the town of Crisfield show conspicuously.

Crisfield, a small town on the east bank of the river, 2 miles above its mouth, is the largest oyster depot on the eastern shore of Maryland; it also has some trade in lumber and wood. Coasting vessels and vessels in the bay trade of 12 feet draught and less are engaged in the carrying trade. Steamers from Baltimore make regular trips to Crisfield for freight and passengers.

The channel though narrow is well marked by two light-houses and a number of buoys; it was dredged to a depth of 12 feet at low water, but the depth and width are said to be decreasing.

Anchorage for vessels over 7 feet draught is in the channel; vessels of less draught can anchor on the flats south of Somer's Cove Light-house (see table, page 18).

† The lower part of Tangier Sound, to Deal's Island, is shown on Coast and Geodetic Survey chart **133**, scale $\frac{1}{80,000}$, price $0.50. The upper part is shown on chart **134**, scale $\frac{1}{80,000}$, price $0.50. Tangier Sound is also shown on chart **376**, scale $\frac{1}{400,000}$, price $0.50.

Strangers usually take a pilot, coming to anchor south of Jane's Island Light-house with signal set until one comes off from shore, or, an oysterman is taken lower down the sound.

There are two marine railways at Crisfield capable of taking out the vessels that trade there. Water can be had alongside the wharf and bituminous coal in limited quantities can be had by special arrangement with the Eastern Shore Steamboat Co.

The mean rise and fall of tides at Crisfield is 1.9 feet.

BIG (GREAT) ANNEMESSEX RIVER

enters the eastern side of Tangier Sound about 16 miles north of Watt's Island Light-house and opposite Kedge's Straits; its entrance bearing **E. ¼ S.**, distant 6¾ miles from Solomon's Lump Light-house. The river is wide and full of flats and shoals; several shallow creeks empty into it. **Holland Point**, about 5 miles above its mouth, is the head of navigation and can be reached by vessels of 8 feet draught. The shores are low and marshy, backed by farms. The only settlements are **Fairmount** and **Marion**, the former on the north side and the latter on the south side, some distance back from the shore line.

There is some trade in lumber and oysters; small sailing vessels, owned in the vicinity, carry practically the whole of it. When strangers enter, which rarely occurs, they should either take a pilot at Crisfield or at the mouth of the river. The channel is not buoyed, and there are no natural aids to assist a stranger in entering.

Ice seldom endangers shipping, though the whole river freezes over in winter.

The general direction of the tidal currents is with the channel, and the mean rise and fall of tides about 2 feet.

Sailing directions for the river would be useless; local knowledge is necessary to avoid the shoals.

MANOKIN RIVER

empties into the eastern side of Tangier Sound about 20 miles above Watt's Island Light-house, and **NE.** by **E.** from Kedge's Straits. The mouth, though wide, is obstructed by extensive sand shoals and oyster beds, between which a comparatively narrow and crooked channel leads into the river from near the mouth of the Big Annemessex. Another channel, with a depth of 6 feet, leads into the river from the northward, passing south of Deal's and Little islands. The entrances to both of these channels are marked by buoys; there are no aids to assist a stranger to keep in the channel above the entrance. A local pilot is necessary.

The river is navigable for small craft to **Princess Anne**, the county seat of Somerset County, which is about 16 miles above its mouth. Vessels of 7 feet draught can go up about 9 miles; their cargoes are then lightered up to Princess Anne. There are several landings on the lower part of the river, but no villages of importance. **Fairmount** is on the neck of land between the mouths of the Manokin and the Big Annemessex. At the mouth of **Teague's Creek**, near Fairmount, there is a small marine railway.

The principal trade is in oysters, lumber, and farm produce, carried entirely in small vessels owned in the vicinity. **Pilots** can be obtained at the mouth of the river but strangers seldom enter.

The **tidal currents** follow the general direction of the channel and the mean rise and fall of the tides is about 2 feet, much affected, however, by prevailing winds.

DEAL'S ISLAND

on the eastern side of Tangier Sound and the north side of the entrance to Manokin River, is a small island and village from which considerable farm produce and oysters are shipped to Baltimore and northern markets. **Little Island**, a small island lying just to the southward of Deal's Island, is mostly low marsh, but little elevated above high-water mark; near its western side the land is a little higher and has a few houses. The passage between Deal's Island and Little Island, called the **Lower Thoroughfare**, is available only for small craft. A channel has been dredged, under the supervision of the U. S. engineers, from the 7 foot curve in Tangier Sound to the wharf at the entrance to Lower Thoroughfare; this channel, in 1882 had a width of 80 feet and depth of 6 feet at mean low water. Strangers should not enter the Lower Thoroughfare without a pilot.

MONIE BAY AND WICOMICO RIVER

have a common entrance on the eastern side of Tangier Sound near its head and east of Hooper's Straits. Monie Bay, shoal and of no importance, has two shallow creeks emptying into it near its head. Vessels entering the Wicomico encounter strong tidal currents setting across the channel at the mouth of Monie Bay, and in winter heavy ice from it is also a source of danger.

The entrance from Tangier Sound is more than 2 miles wide but is obstructed by large oyster-beds, between which a narrow, crooked channel leads into Wicomico River. This channel is marked by **Great Shoals Light-house** (see table, page 18) and a number of buoys and beacons for a distance of 4 miles; farther up there are only local aids, which are of no use to a stranger. Strangers should take a pilot if bound into the river.

Salisbury, a village about 17 miles above the mouth of the river, is at the head of navigation. A dredged channel 90 to 145 feet wide and 7 feet deep at low water leads from 2 miles below to Salisbury. The greatest draught of vessels entering the river is 9 to 10 feet, but this draught requires high water. **White Haven** is a village on the north shore of the river about 6 miles above Great Shoals Light-house; it has 3 small marine railways. There is also a small marine railway about 5 miles below Salisbury.

Salisbury, White Haven, and the different landings, have considerable trade in lumber and farm produce carried principally in vessels owned in the vicinity; strangers are also employed in the carrying trade. Steamers make regular trips between Baltimore, Salisbury, and other landings on the river. **Pilots** for the river can be had from Long Point, or from Dame's Quarter Creek, when abreast of Great Shoals Light-house.

The **tidal currents**, when fairly in Wicomico River, follow the general direction of the channel, but in entering the river caution is necessary, as the strong tidal current of Monie Bay, especially the flood, sets across the channel and has a tendency to set a vessel on the shoals. The mean rise and fall of the tides is about 2.7 feet at the mouth of the river and 3.2 feet at Salisbury.

NANTICOKE RIVER

empties into the head of Tangier Sound from the northeastward; its entrance being just north of the entrance to Monie Bay and Wicomico River. About 24½ miles above its mouth the river is divided into the **East** and **West** branches; several creeks of no importance, except **Broad Creek**, empty into the river and these branches. Nanticoke River has a navigable channel with a least depth of 8 feet at low water from its mouth to the town of **Seaford, Del.**, 36 miles above. The deepest draught vessels entering the river is 13 feet at high water, this draught can be taken to the village of Vienna, 21 miles above the entrance.

The western point at entrance to the river is marked by **Clay Island Light-house**,† (see table, page 18) on the southwestern extremity of Clay Island. The channel, leading between oyster-beds and shoals at the mouth of the river, is marked by buoys for a distance of 10 miles from its entrance; above this there are none but local aids.

Strangers entering the river should take a pilot; if coming through Hooper's Straits one should be taken at Bishop's Head; if coming up Tangier Sound from the southward a vessel can follow the buoys until up to Roaring Point where a pilot should be taken.

Vienna is a village on the west bank about 21 miles above the mouth of the river. **Riverton**, on the east bank, about 3½ miles above Vienna, is a small village of little importance; the **East** and **West** branches join abreast the village where the river is known as **The Forks**. **Sharptown** is a village on the east bank about 28 miles above the mouth of the river on the East Branch. **Galestown** is a small village on the west bank at the mouth of a small creek about 1 mile above Sharptown. A landing is about ⅛ mile above the mouth of this creek. **Laurel** is a town at the head of navigation on Broad Creek; the latter empties into East Branch from the eastward about 1 mile above Galestown Wharf. A dredged channel, with 4 feet at low water, leads to the town of Laurel. **Seaford** is a town on the west bank of the East Branch about 36 miles above the mouth of the river. It has railroad and steamboat communication. Two bridges cross the river at this point, the upper being a close bridge.

Crotcher's Ferry is a small village on West Branch about 3½ miles above The Forks. **Federalsburg** is a small town on the West Branch about 11 miles above The Forks. Vessels of 5 feet draught can go nearly up to the town.

These villages have considerable trade in lumber and farm produce, carried by vessels owned in the vicinity and by strangers. Steamers engaged in the bay trade ply between Seaford and landings on the river and Baltimore.

FISHING BAY

is the continuation of Tangier Sound, to the northward, above Clay Island and Bishop's Head. It is full of oyster-beds and shoals, and is of little commercial importance; oysters and some ship-timber are carried principally in vessels engaged in the bay trade. The prevailing depth in the lower part of the bay is 7 to 11 feet. A narrow channel has 14 feet of water as far up as **Fishing Point**—5½ miles above Clay Island Light-house—; this channel is not buoyed. Vessels of over 6 feet draught should not pass above Fishing Point without a pilot. A stranger entering the bay should take a pilot at Bishop's Head or just below Clay Island Light-house. The deepest draught vessels entering the bay is 10 feet; vessels of 6 feet draught sometimes go up as far as the mouth of the **Black Water River**—about 3 miles above Fishing Point.

GENERAL DIRECTIONS—TANGIER SOUND.

1. ***Approaching and entering the Southern end of the Sound.—I. Coming from the Southward.***—Keep at least 3 miles from the eastern shore. When Tangier Sound Light-house is made bring it to bear betweeen **N.** and **NE.** and steer for it. Pass about ¾ mile to the eastward of the light-house, and when it bears **W.** follow the directions in Section 2.

II. Coming from the Northward.—Follow the directions on page 87 for approaching Pokomoke Sound from the northward, and when to the southward of Tangier Island Flats, south end, buoy (spar, black, No. 1) haul to the northward; pass about ¾ mile to the eastward of Tangier Sound Light-house and be guided by the directions in Section 2.

Remarks.—Keep well off the eastern shore; there are no dangers in approaching the Sound from the southward. Watt's Island should not be approached closer than 3 miles, when to the southwestward of it, on account of the shoals which surround the island. **Watt's Island**, seen from the southward, is low and flat, with scattered groups

† This light will be discontinued when the light-house on Shark's Fin Shoal is completed.

View of Southern Entrance to Tangier Sound, Watts Id. Lt. Ho. bearing E.N.E. distant 5 Miles.

View of Entrance to Kedge's Straits, the Lt. Ho. bearing E.NE. ½ E., distant 4½ Miles.

Entrance to Choptank River from the Northward, Sharp's Id. Lt. Ho. bearing S.SE. ½ E., dist. 3 Miles.

of trees and a few houses; the light-house shows prominently from this direction; it is on a small islet to the southward of Watt's Island. **Tangier Island** is low, flat, and partly wooded; it has quite a village and a landing for steamers. **Tangier Sound Light-house**, a screw pile structure showing a fixed white light with a red sector covering the shoals to the westward, shows prominently off the southeastern end of Tangier Island. **Cod Harbor** is a shallow cove in the southeastern end of Tangier Island; it is entered from Tangier Sound.

2. ***From abreast Tangier Sound Light-house to abreast Solomon's Lump Light-house.***—Having entered the sound as directed in section 1 foregoing, pass about ¾ mile to the eastward of Tangier Sound Light-house and steer **N.** by **E.** for about 6 miles. This course made good will lead up to Great Fox Island shoal buoy (nun, red, No. 2). Leave this buoy ¼ to ½ mile on the starboard hand and steer **N.** ¾ **E.** until Jane's Island Light-house bears **E.**, distant about ¾ mile. Now steer **N NE.** ¾ **E.**, passing about ¼ mile to the westward of Jane's Island shoal buoy (nun, red, No. 4). This course made good for 2¾ miles will lead about ¼ mile to the eastward of Terrapin buoy (spar, black, No. 5), and when it bears well abaft the beam steer **N NW.** ¼ **W.** about 3¾ miles. Piney Island Shoal buoy (spar, red, No. 6) should be made directly ahead. Haul more to the westward so as to leave this buoy about ⅜ mile on the starboard hand, then follow the directions in Section 3.

When Solomon's Lump Light-house bears **W.** by **N.** you should then be about 1¼ miles south of Piney Island Shoal buoy, and may anchor in 4 to 7 fathoms by standing to eastward until the water shoals to this depth.

If bound into Big Annemessex River or into Manokin River take a pilot.

If bound into Little Annemessex River to Crisfield.—When on the **N.** ¾ **E.** course coming up the sound Jane's Island Light-house bears **NE.** by **N.**, steer for it. When the light-house is about ⅜ mile distant ahead, steer about **NE.** by **E.** and be guided by the aids and chart, or take a pilot. The channel is narrow and cannot readily be followed by a stranger, although it is well buoyed.

Remarks.—From the southern entrance of the sound to abreast Solomon's Lump Light-house, a distance of about 17 miles, the channel is nowhere less than ¾ mile wide, and in some places it has a width of about 2 miles; the depth varies from 3 to 17 fathoms.

The land on both sides is low and without any very marked features; the shore line is very broken and irregular. **Great Fox Island**, on the eastern side of the sound, about 7 miles above Watt's Island Light-house, is low, flat, and bare. It has two remarkably tall, slim poplar trees and a few houses.

In standing to the northward after passing Great Fox Island buoy, **Jane's Island Light-house**, **Somers' Cove Light-house** (see table, page 18), and the houses of Crisfield will be seen to the northward and eastward.

Dangers and Aids.—**Shoals** with 2 to 18 feet of water extend 2 miles to the westward from Watt's Island.

The broad opening between Tangier Island and Smith's Island to the northward is completely filled by an extensive shoal ground, having ½ to 1 foot of water over it, and by numerous small islands and spots bare at low water.

Great Fox Island Shoal buoy (nun, red, No. 2) is on the western edge of the shoal, making out 1½ miles to the westward from Great Fox Island.

Jane's Island Light-house (see table, page 18) is just to the northward of the entrance to Little Annemessex River, near the end of the shoal which makes out to the westward from the northern point at entrance.

Jane's Island Shoal buoy (nun, red, No. 4), lying ½ mile **NW.** ½ **W.** from Jane's Island Light-house, marks the western edge of the shoals at the mouth of Little Annemessex River, and the eastern side of the channel on the sound.

Terrapin buoy (spar, black, No. 5), about 2¼ miles **N.** ½ **E.** from Jane's Island Light-house, lies on the western side of the channel and on the eastern edge of the extensive shoals making out 3 miles to the eastward from Smith's Island. To the southward of this buoy the edge of the shoals runs in a southwesterly direction; to the northward of the buoy the edge curves to the northwestward. The narrowest and deepest part of the channel is abreast this buoy.

Piney Island Shoal buoy (spar, red, No. 6), about 3½ miles **N.** by **W.** ¾ **W.** from Terrapin buoy, marks the southwestern edge of the extensive shoal flats lying between the channel of Manokin River and the channel of Tangier Sound. This buoy is to the northwestward of the entrances to Big Annemessex and Manokin rivers. It is left well on the starboard hand going up the sound.

3. ***From abreast Solomon's Lump Light-house to Clay Island Light-house.***†—Having come from the southward as directed in Section 2 foregoing, when about ⅜ mile to the westward of Piney Island Shoal buoy, steer **N.** by **W.** ½ **W.** This course made good for 3 miles will lead close to the westward of Deal's Island Shoal buoy (spar, red, No. 8). From this buoy steer **N.** for 4 miles, when Haines' Point buoy (spar, red) should bear **E.**, 1 mile distant. Then change the course to **N.** by **E.** ⅞ **E.** so as to pass ¼ mile to the westward of Drumming Shoal buoy (spar, red, No. 10), on the north end of Drumming Shoal.

From Drumming Shoal buoy the course to Shark's Fin Shoal buoy (spar, black, No. 7), lying ⅛ mile **SW.** by **S.** from Clay Island Light-house, is **N.** by **W.** When up to this buoy, if bound

† A light-house is to be erected on the north end of Shark's Fin Shoal.

up Fishing Bay take a pilot; if bound out through Hooper's Straits reverse the directions for entering by those straits.

If bound into Monie Bay or Wicomico River.—When ¼ mile to the westward of Drumming Shoal buoy (spar, red, No. 10) steer **E NE. ½ E.**, pass about 200 yards to the southward of Nanticoke Point Spit buoy (spar, red and black horizontal stripes), and continue the course until up to Long Point Flats buoy (spar, red, No. 2). Leave this buoy close-to on the starboard hand, and steer about **E. ¾ S.** so as to pass 200 yards to the southward of Great Shoal Light-house. Anchor near the light-house and take a pilot if bound up the Wicomico river; or, be guided by the aids, leaving them on the side indicated by their color.

If bound up the Nanticoke River.—When about ¼ to ½ mile to the westward of Drumming Shoal buoy (spar, red, No. 10) steer **NE. ⅞ E.** This course will lead north of Nanticoke Point Spit buoy (spar, red and black horizontal stripes) and just to the southward of Clay Island Shoal buoy (spar, black, No. 1). When about 500 yards to the eastward of this buoy steer **N. by E. ½ E.** and leave Oyster Rock buoy (spar, red, No. 4) about 150 yards on the starboard hand, then steer **N. by E.** Roaring Point buoy (spar, red, with bush) will be made ahead and left 100 yards on the starboard hand. Strangers bound above Roaring Point should take a pilot. Good anchorage is found in the channel below and just above Roaring Point.

Remarks.—The channel from Solomon's Lump Light-house to Clay Island Light-house is about ¾ mile wide and has a depth of from 3 to 13 fathoms. The shore line on both sides is low and very broken, and presents no marked natural features that might be used by a stranger.

Standing up the Nanticoke River, Roaring Point (low sand-spit backed by trees, with a landing and several houses on its south side) will be readily distinguished. Along the eastern shore of the river are extensive oyster-beds.

Dangers and Aids.—Extensive shoals make out from the mainland and islands, but a detailed description of them that would be of value to a stranger cannot be given. The buoys and light-house are the only guides. Very light-draught vessels, when beating, might manage to keep off the shoals by careful and constant use of the lead.

KEDGE'S STRAITS.†

The middle entrance into Tangier Sound from Chesapeake Bay lies between South Marsh on the north and Smith's Island on the south; it bears **E.** from Point Lookout Light-house, distant about 13 miles. This entrance to the sound is the most direct passage to the Manokin, Big Annemessex, and Little Annemessex rivers, for vessels coming down Chesapeake Bay; it is marked by **Holland's Island Bar** and **Solomon's Lump** light-houses (see table, page 18). The channel has a least depth of 9 feet and is marked by two buoys. On both sides of the straits the land is low, with a few trees; the only marks easily recognized are the old light-tower on Fog Point and the light-houses.

The deepest draught taken through the straits is 9 feet, usually near high water; strangers seldom enter. **Floating** ice in the winter makes the navigation of the straits very dangerous: tugs from Baltimore are generally employed to tow oystermen through the ice.

GENERAL DIRECTIONS—ENTERING TANGIER SOUND BY KEDGE'S STRAITS.

These directions are good for a draught of 8 feet; local knowledge is necessary to carry a greater draught. Strangers are advised not to use this passage except in the daytime.

I. ***If coming from the Southward.***—Keep at least 2 miles from the shore of Smith's Island, and when Holland's Island Bar Light-house is made steer for it on any bearing between **N.** and **NE.** When Solomon's Lump Light-house bears **E.** steer about **E.** by **N.** until the entrance buoy (spar, white and black perpendicular stripes) is made, when the directions in par. III should be followed.

II. ***If coming from the Northward.***—Pass about 2 miles to the westward of Bloodsworth and Holland's islands, and about 1¼ miles to the westward of Holland's Island Bar Light-house. Steer for Solomon's Lump Light-house when it bears **E SE. ½ E.**, passing about ⅜ mile south of Holland's Island Bar Light-house, until the entrance buoy is made.

III. ***When the entrance buoy is made*** steer for it, course about **E.** by **N.**, and pass it close-to on either hand; then steer **E.** about 1 mile, when the course should be changed to **E SE. ½ E.**, keeping Solomon's Lump Light-house a little on the starboard bow; leave the light-house about 100 yards on the starboard hand and steer about **E.**, heading so as to pass close to the southward of South Marsh Spit

† Shown on Coast and Geodetic Survey Chart **133**, scale $\frac{1}{80,000}$, price $0.50.

buoy (spar, black, No. 1). When up to this buoy steer about **E.** by **S.**; this course leads into the channel of Tangier Sound. Then:

If bound up the sound, when the water has deepened to 10 fathoms steer about **N.** until Piney Island Shoal buoy (spar, red, No. 6) is made, when follow the directions in Section 3 "Tangier Sound," page 91.

If bound down the sound.—On the **E.** by **S.** course, when the water has deepened to 10 fathoms or over, steer about **S SE.** ¼ **E.** until Terrapin buoy (spar, black. No. 5) is made, when the directions (reversed) in Section 2 "Tangier Sound," page 91, should be followed.

Remarks.—In approaching Kedge's Straits no very prominent landmarks will be noticed. The most conspicuous objects seen will be Holland's Island Bar Light-house, the old white light-house tower on **Fog Point** (the northwest point of Smith's Island), the trees to the southward of it, and Solomon's Lump Light-house on the shoals making out to the northward of the island. **South Marsh**, the low, irregularly shaped island on the north side of the straits, is without any prominent marks. Northwest from South Marsh are several small islands; **Holland Island**, the largest and southernmost of these, has several houses and a few trees which will be seen in passing along to the westward of the island.

Dangers and Aids.—**A shoal**, with 1 to 6 feet over it, makes to the southward from Holland's Island, and is marked near its southern side by **Holland's Island Bar Light-house.**

Solomon's Lump Light-house (see table, page 18) is on the south side of the channel, near the middle of the straits.

Entrance buoy (spar, white and black perpendicular stripes) is at the western entrance of the straits, 1¾ miles **W NW.** ½ **W.** from Solomon's Lump Light-house.

South Marsh Spit buoy is on the north side of the channel, a little more than ¾ mile **E NE.** ¾ **E.** from Solomon's Lump Light-house.

HOOPER'S STRAITS,†

the northern entrance from Chesapeake Bay into Tangier Sound, is the most direct passage for vessels coming down Chesapeake Bay bound to Fishing or Monie bays and the Wicomico or Nanticoke rivers. It leads between Hooper's Island and the mainland on the north and Bloodsworth Island on the south. The channel leads between shoals which make out from the shore on both sides: it is marked by several buoys and Hooper's Straits Light-house.‡ The least depth found, when closely following the channel, is 10 feet, but 9 feet usually is the greatest draught of vessels passing through the straits at high water. Strangers bound to any of the tributaries of Tangier Sound can find pilots at **Bishop's Head**, the north side of the eastern entrance to Hooper's Straits.

GENERAL DIRECTIONS—APPROACHING AND ENTERING TANGIER SOUND BY HOOPER'S STRAITS.

Strangers of over 8 feet draught should take a pilot; vessels of 8 feet or less draught should have no difficulty in entering by the following directions. Strangers should not attempt to enter at night.

I. ***If coming from the southward.***—Give the shore of Bloodsworth's Island a berth of 1½ miles and steer for the southeastern end of Hooper's Island until within 1¼ miles of it; then haul to the eastward, and when Hooper's Straits Light-house bears **E.** by **N.** steer for it on that bearing until Bloodsworth Island Flats northwest end buoy (nun, red, No. 2) is made, when the directions in par. III should be followed.

II. ***If coming from the northward.***—Keep at least 2½ miles from the shore of Hooper's Island until its southern end bears to the northward of **E NE.** When Hooper's Straits Light-house bears between **E.** by **N.** and **E.** ½ **N.** steer for it until Bloodsworth Island Flats northwest end buoy (nun, red, No. 2) is made.

III. ***When Bloodsworth Island Flats northwest end buoy is made,*** steer for it on any bearing between **NE.** by **E.** and **E.** Pass ¼ mile to the northward of this buoy and steer for Hooper's Straits Lighthouse, bearing **E.** ½ **N.** When ½ mile from this light-house haul to the southward and steer about **SE.** by **E.** ½ **E.** so as to pass about midway between the light-house and Bloodsworth Island Flats north end buoy (spar, red, No. 4). Continue the **SE.** by **E.** ½ **E.** course until red buoy No. 4 bears **SW.** ½ **W.**, then steer **E SE.** ⅞ **E.** for ⅝ mile; the light-house should then bear **NW.** by **W.** and Bishop's Head Shoal buoy (spar, black, No. 1) should be seen bearing **SE.** ¼ **S.** Steer for this buoy, pass 250 yards to the southward of it, and then steer about **NE.** ¾ **E.** until Clay Island

† Shown on Coast and Geodetic Survey chart **134**, scale $\frac{1}{80,000}$, price $0.50.

‡ A light-house is to be built on the north end of Shark's Fin Shoal, in Tangier Sound, which is also an aid for this passage.

Light-house bears **NE.** by **E.** $\frac{3}{4}$ **E.** Then steer for the light-house until Shark's Fin Shoal buoy (spar, black, No. 7) is brought to bear **SE.** $\frac{3}{8}$ **S.**, when steer for it.

To stand down the sound, reverse the directions on pages 91–92, for proceeding up the sound, or, get a pilot at Bishop's Head.

IV. ***At night.***—Hooper's Straits and Clay Island light-houses have red sectors which cover the edge of Bishop's head Shoals. Vessels of less than 8 feet draught may stand in for Hooper's Straits Light-house (course **E.** $\frac{1}{2}$ **N.**), and pass about $\frac{1}{4}$ mile to the southward of it. Then steer about **SE.** $\frac{1}{2}$ **E.**, keeping in the white rays of Hooper's Straits Light until the red rays of Clay Island Light have been crossed. When well in the white rays of Clay Island Light steer about **NE.** by **E.**, crossing the red rays of Hooper's Straits Light and keeping in the white rays of Clay Island Light. Continue the **NE.** by **E.** course until within about 1 mile of Clay Island Light, then turn to the southward and anchor $\frac{1}{2}$ to 1 mile **S SW.** from the light-house.

Remarks and aids.—The channel of the straits is marked by three buoys and two light-houses. The tidal currents sometimes have considerable velocity and allowance should be made for them.

Bloodsworth Island Flats buoy, northwest end (nun, red, No. 2.), is at the western entrance of the straits and at the northwest extremity of the shoals, making out $1\frac{1}{2}$ miles from Bloodsworth Island.

Hooper's Straits Light-house (see table, page 18) is on the north side of the channel near the edge of the shoals making out to the westward from Bishop's Head.

Bloodsworth Island Flats buoy, north end (spar, red, No. 4) is on the northern edge of the shoals making out to the northward from Bloodsworth Island. This buoy lies about $\frac{3}{4}$ mile **S.** by **E.** $\frac{1}{2}$ **E.** from Hooper's Straits Light-house, and the channel leads between them.

Bishop's Head Shoal buoy (spar, black, No. 1) marks the southern extremity of the shoals extending to the southward from Bishop's Head.

Shark's Fin Shoal is an extensive shoal making to the northeastward about $2\frac{3}{4}$ miles from the eastern side of Bloodsworth Island. It is marked at its northeastern end by a buoy (spar, black, No. 7) which is left on the starboard hand by vessels standing through the straits and down Tangier Sound.

Clay Isand Light-house (see table, page 18), at the western extremity of Clay Island, is an aid in passing through the straits or standing up or down Tangier Sound.

HONGA RIVER †

is a large, irregular body of water on the eastern side of Chesapeake Bay, between the main land and Hooper's Island, about 70 miles above Cape Charles. It is about 12 miles long in a general **N NW** and **S SE.** directon, full of oyster beds and shoals, and has a narrow, crooked channel with a least depth of 19 feet to within 4 miles of its head. **Hooper's Island,** which separates the river from Chesapeake Bay, is about 9 miles long, in several places very narrow, and separated from the main land at its northern end by a narrow shallow stream called **Fishing Creek.**

The river is of little commercial importance and is seldom entered by strangers. Its trade consists of oysters, cordwood and timber, carried mainly in vessels engaged in the bay trade. Steamers from Baltimore stop at one of the landings on the river. The western entrance to Hooper's Straits is also the approach to the entrance of Honga River. The channel at the entrance is marked by two buoys, but above **Windmill Point,** about 3 miles from its mouth, there are no aids to assist in keeping a vessel in the channel except those known to local pilots. Strangers bound into the river should take a pilot at the entrance, coming to anchor, if necessary, until one is procured.

Fox Creek, a large irregular bight in the eastern shore of the river, about 2 miles above the entrance, is shallow, but has a buoyed channel with 7 feet of water. The steamboat landing is on this creek.

There are several small settlements on both shores of the river, but none of them are of commercial importance.

GENERAL DIRECTIONS—HONGA RIVER.

In approaching, follow the directions (page 93) for approaching Hooper's Straits, pass $\frac{1}{4}$ to $\frac{3}{4}$ mile to the westward of *Bloodsworth Island Flats* northwest end buoy (nun, red, No. 2) and steer about **N.** $\frac{1}{2}$ **E.** until *Outer buoy* (spar, black, No. 1) is made. Pass close to the eastward of this buoy and steer **N.** $\frac{1}{2}$ **W.** for *Inner buoy* (spar, black, No. 3). Outer and inner buoys are on the edge of the shoals making out to the eastward from the southeastern end of Hooper's Island. These shoals rise very abruptly from the channel.

When up to Inner buoy, haul gradually to the westward. *Crab Point Shoal buoy* (spar, red, No. 2) marking the entrance to Fox Creek will be made to the northward, and should be left on the starboard hand. When this buoy bears **N.**, distant a little less than $\frac{1}{2}$ mile, steer **W NW.** $\frac{5}{8}$ **W.**, and when Windmill Point bears **N.**, anchor in about 5 fathoms.

If desiring to proceed further up, a pilot should be obtained.

If desiring to enter Fox Creek, pass 200 to 400 yards to the northward of *Crab Point Shoal buoy* and steer **E NE.** $\frac{3}{4}$ **E.** for *Long Point Shoal buoy* (spar, black, No. 1). Seven feet may be taken into Fox Creek.

† Shown on Coast and Geodetic Survey chart **134,** $\frac{1}{80,000}$, price $0 50

TAR BAY †

is the shallow, unimportant body of water east of Barren Island, on the eastern shore of Chesapeake Bay, east of Pautuxent River entrance. Large shoals extend to the southward of Barren Island and along the western shore of Hooper's Island to its southern end.

LITTLE CHOPTANK OR HUDSON RIVER ‡

empties into the eastern shore of Chesapeake Bay about 90 miles above Cape Charles and 55 miles below Baltimore. The river, for some distance above its mouth, is wide but full of extensive shoals and oyster beds. A draught of 15 feet can be taken into the mouth of the river, but strangers over 9 feet draught should not enter without a pilot. The entrance is marked by two buoys and inside the points at entrance are two more, above which there is a good anchorage in 12½ to 19 feet water, soft bottom. A number of creeks, navigable for small vessels, empty into the river above its mouth; on the north shore are **Brook's**, **Hudson**, **Phillip's**, and **Beckwith's** creeks, and on the south shore are **Slaughter**, **Wolford's**, **Tobacco Stick**, and **Church** creeks. There are others of less importance.

Wood, lumber, farm produce and oysters are shipped from the landings on the river and its tributaries, in vessels engaged in the bay trade; strangers seldom enter the river.

Pilots can be had by making signal off the entrance, coming to anchor, if necessary, until boarded by one. Strangers bound into the river should take a pilot.

GENERAL DIRECTIONS—LITTLE CHOPTANK RIVER.

The following directions lead to an anchorage in the mouth of the river, and are, if closely followed, safe for vessels of 15 feet draught. Vessels should not attempt to run into this river, unless the buoys can be plainly seen; there are no lights to assist at night.

I. ***Approaching and Entering—From the Southward.***—Steer so as to pass 2 miles to the westward of **James Point** (the northwest point of James Island and the southern point at entrance to the river) then bring the eastern shore of Sharp's Island to bear **N.** by **E.** ½ **E.**, and stand for it. James Point Shoal buoy will be made on the starboard bow, when follow the directions in par. III.

II. ***Approaching and Entering—From the Northward.***—Give the western shore of Sharp's Island a berth of at least 2 miles, pass to the westward of Sharp's Island Shoal buoy (nun, red, No. 16) and when James Point bears **SE.** by **S.** steer for it until James Point Shoal buoy is made.

III. ***When James Point Shoal buoy*** (spar, red, No. 2) at the western entrance to the river is made, steer for it; pass close to the northward of it and then steer **SE.** by **E.** ½ **E.** On this course Hill's Point Shoal buoy (spar, black, No. 1) should be made on the port bow and left about ½ mile on the port hand. Abbott's Point Shoal buoy (spar, red, No. 4) will be made on the starboard bow and should be left about ¼ mile on the starboard hand. After passing this buoy, anchor; no directions that would be of use to a stranger can be given for proceeding up the river; a stranger should take a pilot.

Dangers.—Shoals with 1 to 18 feet of water over them extend out 1¾ miles to the northward from James Island. The channel into the river has 15 to 18 feet of water and leads across these shoals about 2 miles to the northward of James Point. On the north side of the channel the shoal has a least depth of 9 feet.

A shoal also makes out about 1⅝ miles in a northeasterly direction from James Island, but has a depth of not less than 15½ feet over its outer part. Abbott's Point Shoal buoy (spar, red, No. 4), marking this shoal, lies one mile **NE.** ½ **E.** from the northeastern point of James Island.

The extremities of the shoals making out to the westward from Hill's Point and Ragged Point are marked by black spar-buoys.

Anchorage.—In the bight between the northern point of James Island and Hoopers' Point, the northeastern point of Taylor's Island, good anchorage will be found in 12 to 18 feet water, soft bottom, by giving the shore a berth of at least ½ mile.

CHOPTANK RIVER §

empties into the eastern side of Chesapeake Bay about 95 miles above Cape Charles and 50 miles below Baltimore. **Sharp's Island** and light-house lie off the middle of its northern entrance in Chesapeake Bay. This river has a least depth of 4 fathoms in the channel up to the town of Cambridge, and is navigable for vessels of 9 to 10 feet draught to within 2 miles of Denton, or about 45 miles above Sharp's Island Light-house. Above Denton the river is being improved by dredging; the project contemplates a channel, with a depth of 6 feet at low water up to Greensborough,

† Shown on Coast and Geodetic Survey chart **134**, scale $\frac{1}{80,000}$, price $0.50.

‡ Shown in parts on Coast and Geodetic Survey charts: **134**, **135**, scale of each $\frac{1}{80,000}$, price of each $0.50.

§ Shown on Coast and Geodetic Survey chart **135**, scale $\frac{1}{80,000}$, price $0.50.

which is about 54 miles above Sharp's Island. Two bridges cross the river between its mouth and Greensborough; the first about 35 miles above Sharp's Island, and the second at Denton; these bridges have draws about 55 feet wide in the clear.

Numerous creeks empty into Choptank River, many of which have from 5 to 10 feet of water and are navigable for the class of vessels trading in Chesapeake Bay. A number of villages and a few towns are situated on the river and its tributaries.

The entrance is obstructed by the shoals making out from the shores of James Island, Sharp's Island, Tilghman's Island, and the main land, and also by detached shoals. The principal dangers along the channel up to the mouth of Hunting Creek, 28 miles above Sharp's Island Light-house, are marked by buoys, and **Choptank River Light-house**, which is off the entrance to Tredhaven (Tread Haven) Creek, 9 miles above Sharp's Island Light-house. A channel leads into the entrance of the river both on the north and south sides of Sharp's Island. The northern channel, marked by Sharp's Island Light-house, has a depth of 15 feet, and leads about midway between **Tilghman's Island**, the northern point at entrance to the river, and Sharp's Island. The southern channel has a least depth of 4½ fathoms and leads to the southward and eastward of Sharp's Island; there are several detached shoal spots in this channel, with 12 to 15¾ feet of water over them, which are not marked. Between the points at entrance and Choptank River Light-house the channel is wide and has a least depth of 3½ fathoms; above the light the channel is narrow and the depths are variable, but a depth of 4 fathoms can be carried up to Cambridge. Above Cambridge the channel is narrow and crooked; although the prominent dangers up to Hunting Creek are marked by buoys, it is advisable for strangers to take a pilot if bound above Cambridge or into any of the tributaries of the river.

Cambridge is a small town on the south bank of the river, about 17 miles above Sharp's Island; it has considerable trade in farm produce, timber and oysters, carried principally in sailing vessels and steamers engaged in the bay trade; a few coasting vessels come here for timber. In summer steamers run daily between Cambridge and Baltimore. There are three marine railways where many small vessels are repaired. A dredged channel 12 feet deep and about 100 feet wide leads from the deep water of Choptank river to the wharf and into a creek called the inner harbor. The mean rise and fall of tides is about 1.7 feet at Cambridge.

Denton, a small town on the east bank of the river about 47 miles above Sharp's Island, was for a long time the head of steamboat navigation; the produce and lumber from higher up the river being brought down in lighters; steamers, and sailing vessels up to 8 feet draught go up to Denton. A draw-bridge crosses the river at this point; width of draw about 55 feet.

Greensborough is a thriving town on the west bank of the river about 7 miles above Denton. A bridge through which lighters can pass crosses the river at this point. The town has considerable trade in farm produce and lumber, and is reached through a dredged channel 5 feet deep at low water. This channel is being improved under the supervision of the U. S. engineers, to permit the steamers making landings farther down the river to go up to Greensborough.

Black Walnut Cove is a shallow, irregular indentation in the south side of Tilghman's Island; it is used by small local vessels as an anchorage in northerly winds. The depth at the anchorage is from 7 to 10 feet, bottom dark blue clay. There are several houses (a small village) on the eastern shore of the cove, and a wharf to the westward of **Black Walnut Point** (the eastern point of the cove).

Harris Creek empties into Choptank River from the northward just to the eastward of Tilghman's Island. The entrance between **Nelson's Point** on the east and **Black Walnut Point** on the west, is about 2¾ miles wide, but there are extensive shoals making out from both shores. Above the entrance the creek becomes narrow and crooked and as there are no aids, it can only be navigated by those well acquainted with the channel. Local vessels of 8 feet draught are taken up about 9 miles above Black Walnut Point to within 1 mile of **Whitman**, a village near its head. Several small, unimportant creeks empty into Harris Creek.

Broad Creek empties into Choptank River from the northward on the eastern side of Nelson's Point. The creek is about 8 miles long and has several tributaries into which a draught of 8 feet can be taken. These waters are frequented only by vessels acquainted with the locality and drawing 9 feet or less water; a draught of 8 feet can be taken to within 1 mile of the town of **St. Michaels**. There are no aids to assist a stranger in entering the creek, **Back Creek** and **Edge Creek** are the two most important tributaries.

Tredhaven (Tread Haven) Creek empties into Choptank River from the northeastward; the entrance lying north of Choptank River Light-house. **Oxford** is a village on the east bank of the creek about 2 miles above Choptank River Light-house. The town of **Easton** is at the head of navigation, about 9 miles above the mouth of the creek. A channel 150 feet wide and 8 feet deep has been dredged in the upper part of the creek to Easton Point. Steamers and sailing packets are engaged in the carrying trade to Baltimore from Oxford, Easton and the landings on the creek. There are no aids, except local ones, to assist in keeping a vessel in the channel. A number of unimportant creeks, into which a draught of 8 feet can be taken, empty into Tredhaven Creek. The mean rise and fall of tides in the creek is about 2 feet.

Secretary Creek is a small stream emptying into Choptank River from the eastward, about 6½ miles above the town of Cambridge. **East New Market** is a small thriving town at the head of the creek about 3 miles above its mouth. A channel 7 feet deep and 100 feet wide was dredged from the deep water of Choptank River to **East New Market Wharf** about 1½ miles above the mouth of the creek and about halfway to the town. Steamers running to Baltimore, and sailing vessels engaged in the bay trade take freight from the wharf. The mean rise and fall of tides is about 1½ feet.

Cabin Creek empties into the eastern side of Choptank River about 1½ miles above Secretary Creek. A channel with a depth of 5½ feet and width of 80 to 150 feet leads from the entrance to the wharf about 500 yards above. Steamers plying to landings on the river stop at this wharf for freight.

Tuckahoe Creek empties into Choptank river from the northward, about 41 miles above Sharp's Island Light-house. **Hillsborough** is the principal village on the creek about 9 miles above its mouth. A draught of 8 feet can be taken 3 miles above the mouth of the creek, and small steamers go as far as **Wayman's**, 3 miles below Hillsborough. Freight shipped from Hillsborough and above is brought down to Wayman's in lighters. The bridge crossing the creek at Hillsborough has a span through which lighters can pass.

Pilots for Choptank River can generally be had when near Sharp's Island by making signal for one. Pilots for the tributaries can be had from the shores at their entrances or at Cambridge.

SAILING DIRECTIONS—CHOPTANK RIVER.

Up to the town of Cambridge the channel (by the passage to the southward of Sharp's Island) has a least depth of 4 fathoms, and by closely following the directions, a stranger should be able to carry at least 3 fathoms to the town of Cambridge. The passage between Sharp's Island Light-house and Tilghman's Island (northern entrance) is good for a depth of 13 feet and can be entered without difficulty by following the directions.

1. ***Approaching and Entering.—From the Southward.***—Coming up Chesapeake Bay, shape the course so as to pass 1½ miles to the eastward of Cove Point Light-house. and stand **N.** by **W.** ½ **W.** for a little over 9 miles until James Point (the northwest point of James Island) bears **E.** ½ **S.**, distant 3⅛ miles (Sharp's Island Light-house will then bear **N.** by **E.** ⅞ **E.** and be a little open to the westward of Sharp's Island). Then change the course to **NE.** ½ **N.** James Point Shoal buoy (spar, red, No. 2.) will be made on the starboard bow and left ¾ mile on the starboard beam. The course leads 1 mile to the southeastward of the southern end of Sharp's Island and 1½ miles to the eastward of the northern end of that island.

Continuing the **NE.** ½ **N.** course Cook's Point Shoal buoy (spar, red, No. 2.) will be made on the starboard bow, when it bears **SE.** by **E.** ¾ **E.**, Sharp's Island Light-house bearing **W.** ½ **S.**; steer **E.** ⅛ **N.** for Choptank River Light-house (see table, page 18) and be guided by the directions in Section 2 following.

It is not advisable for a stranger to attempt to enter at night by the passage to the southward of Sharp's Island; if bound in at night, drawing less than 13 feet, keep to the northward up the bay until abreast Sharp's Island Light-house, then follow the directions in Section 1 A for entering, coming from the northward.

Remarks.—On the **NE.** ½ **N.** course, care must be taken to avoid being set by the ebb current to the southward on to James Point Shoals (see page 95) or by the flood to the northward on to Sharp's Island Shoals. **James Point**, the southern point at entrance to Little Choptank (Hudson) River, is low and flat, with trees some distance back from the extremity of the point. **Sharp's Island** is low and flat; when seen from the southward it shows several groups and some scattered trees. **Tripp's Bay** is the broad, shallow bight between Hill's Point and Cook's Point to the eastward of Sharp's Island. **Cook's Point**, the southern point at entrance to Choptank River, and about 3¼ miles east from the northern end of Sharp's Island, is long, low and flat, with scattered trees; a group of 3 or 4 trees stands near the extremity of the point. **Tilghman's Island**, to the northward of Sharp's Island, when seen from the southward, is in part heavily wooded.

Dangers and aids.—**Shoals** extend out in every direction from Sharp's Island, and to avoid them its southern end should be given a berth of at least 1¼ miles, and its eastern shore a berth of not less than ¾ mile.

About 2¼ miles **SE.** from Sharp's Island Light-house there is a shoal spot ¼ mile long, **SE.** and **NW.**, and ¼ mile wide, with a least depth of 15¾ feet over it. To avoid it do not bring James Point to bear to the westward of **S.** by **W.** until Sharp's Island Light-house bears to the westward of **NW.** ½ **W.**

Cook's Point Shoal buoy (spar, red, No. 2) marks the northern edge of the shoals making out to the northward and westward from Cook's Point. This buoy should not be approached closer than ½ mile unless it bears to the southward of **E.**

Note the description under Section 1 A of the shoals making out from Tilghman's Island.

1 A. ***Approaching and Entering.—From the Northward.***—Steer for Sharp's Island Light-house on any bearing between **S.** by **E.** ½ **E.** and **E.**, pass ⅜ to ⅝ mile to the northward of it and steer **SE.** by **E.** ¾ **E.** On this course Low's Point Shoal buoy (spar, black, No. 1) will be made on the port bow and should be left ¼ mile on the port hand. After passing this buoy haul gradually to the eastward and steer about **E.** by **N.** until Choptank River Light-house bears **E.** ⅛ **N.**, when steer for it on that bearing and be guided by the directions in Section 2 following.

Remarks.—In standing in on the **SE.** by **E.** ¾ **E.** course, Cook's Point will be a very little on the port bow. On the **E.** ⅛ **N.** course for Choptank River Light-house, Cook's Point Shoal buoy will be made on the starboard bow and should be left ¼ mile on the starboard hand. Light-draught vessels will find good anchorage in 7 to 12 feet, sheltered from northerly and westerly winds, ½ to 1¼ miles to the eastward of Low's Point.

Black Walnut Cove is the shallow body of water lying between Low's Point and Black Walnut Point. The anchorage referred to above is off the entrance to this Cove.

Dangers and aids—**Poplar Island Shoals** make out 1¼ miles to the westward from Poplar Island and rise very abruptly from deep water. The western edge of the shoals is marked by Poplar Island Shoal buoy (nun, red, No. 18). **Shoals** with 12 feet and less over them make out 1 mile in an **N NW.** direction from Sharp's Island, extending ¼ mile beyond the light-house.

Shoals make out in all directions from Tilghman's Island, and its shores should not be approached closer than 1¼ miles.

Low's Point Shoal buoy (spar, black, No. 1), lying 1½ miles **E.** ⅞ **S.** from Sharp's Island Light-house, is near the southern extremity of the shoals making out to the southward from **Low's Point** (the southern point of Tilghman's Island).

From Black Walnut Point (the southeastern point of Tilghman's Island) shoals make out over 1½ miles in a southeasterly direction, leaving the channel to the northward of Cook's Point about ¾ mile in width.

2. ***From Cook's Point to Cambridge.*** Having followed the directions in Section 1 or 1 A preceeding, and brought Choptank River Light-house to bear **E.** ⅛ **N.**, run for it on that bearing until between 1 and 2 miles from it, then haul to the southward so as to pass ½ to ¾ mile to the southward of the Light-house, and steer **SE.** by **E.** for Castlehaven Shoal buoy (spar, red, No. 4). Pass just to the northward of this buoy and continue the **SE.** by **E.** course until Chlora's Point, (see description) the point which will have been left on the port hand, bears **N NW.** ½ **W.**, then bring this point over the stern and steer **S SE.** ½ **E.** keeping the bearing astern. On this course a wooded prominent point called Horn Point, will be seen on the starboard bow, and Howell's Point Shoal buoy (spar, black, No. 3) will be made nearly ahead. Pass close to the westward of this buoy, and when the northern extremity of Horn Point bears **W NW.** ¾ **W.**, steer **E SE.** ¾ **E.**, keeping the point on the bearing astern.

Drumming Ground Shoal buoy (spar, black, No. 5) will be made nearly ahead, and should be left close-to on the port hand; Hambrook Bar Shoal buoy (spar, red, No. 6) will be seen a little on the starboard bow. Pass about 200 yards to the northward and eastward of this buoy and then steer **SE.** ¼ **S.** Make good this course for 1¾ miles and anchor when abreast the town of Cambridge.

If going above Cambridge, take a pilot or be guided by the buoys and chart; the channel is fairly well buoyed as far as the mouth of Hunting Creek, 10 miles above Cambridge.

Remarks.—On the **E.** ⅛ **N.** course Harris Creek and Broad Creek will be opened out; **Tod's Point**, (long and low with a few scattered trees) about 2¼ miles to the eastward of Cook's Point, will be left 1¼ miles on the starboard hand, and **Benoni's Point** will be seen on the port bow to the northward of Choptank River Light-house. As the light-house is approached, Tredhaven Creek will be opened out to the northward, and **Island Creek** (small, shallow, and unimportant), to the eastward (in rear) of the light-house.

Chlora's Point, on the north side of the river, 2 miles **SE.** ½ **E.** from Choptank River Light-house, is low near the end, but heavily wooded a little back from its end; it will be plainly seen when on the **SE.** by **E.** course, and will be left a little over ¼ mile on the port hand. Howell's Point (see description) will be seen beyond Chlora's Point.

Castlehaven is the long low point on the south side of the river opposite Chlora's Point and 2 miles **S.** by **E.** ½ **E.** from Choptank River Light-house.

Lecompte's Bay is the large shallow bight making into the southern shore to the eastward of Castlehaven and to the westward of Horn Point. Vessels of 5 feet or less draught may run in and anchor anywhere in this bay, giving the shore a berth of at least ¼ mile.

Horn Point, on the south side of the river, is well wooded and will show quite prominently on the starboard bow when on the **S SE.** ½ **E.** course.

On the **S SE.** ½ **E.** course **Jenkin's Creek**, making into the southern shore, will be seen, and when nearly down to Horn Point **Dividing Creek**, making into the northern shore will be opened out.

Howell's Point, nearly due **E.** from Horn Point and on the opposite side of the river, is a long, low, and narrow

white sand-spit with a few scattered trees, and a clump of trees on the extreme end of the spit. After passing Howell's Point a large shallow bight with marshy islands will be seen to the eastward of it.

On the **E SE. ¾ E** course, **Hambrook Bar**, a long and low point on the southern shore, with a few scrub trees near its end, will be on the starboard bow and should be left ⅜ mile on the starboard hand.

Dangers and aids.—**Shoals** make out mile 1 to the northward of Tod's Point, and the bight between it and Cook's Point is full of shoals.

There is only 12½ feet of water ¼ mile to the southward of Choptank River Light-house, and the light-house should not be approached closer unless to the eastward of it.

Shoals make out a little over ½ mile to the northwestward from Chlora's Point and to the northward from Castlehaven, leaving the channel between the shoals a little less than ¼ mile in width.

Castlehaven Shoal buoy (spar, red, No. 4) is on the northern edge of the shoals making out from Castlehaven, and should be left close-to on the starboard hand when entering.

Drumming Ground is the shoal ground lying on the north side of the channel opposite Hambrook Bar and 1 mile **E SE.** from Howell's Point. This shoal ground rises abruptly from the deep water of the channel, has from 7½ to 18 feet of water over it, and is marked by black spar-buoy No. 5.

Hambrook Bar Shoal buoy (spar, red, No. 6) marks the northeastern edge of the shoal making out in that direction from Hambrook Bar.

GENERAL DIRECTIONS, ENTERING TREDHAVEN CREEK TO OXFORD.

Following the directions in Section 2, "Choptank River," page 98, when on the **E. ⅛ N.** course and about 500 yards from Choptank River Light-house, steer about **N.** by **E.** heading so as to pass about 500 yards to the westward of **Batchelor's Point**, the first point on the eastern shore above the light-house. Continue the **N.** by **E.** course past Batchelor's Point, and then haul to the eastward for the wharves at Oxford. Anchor in 15 feet water, soft bottom, about 350 yards from the shore.

Or, on the **E. ⅛ N.** course for Choptank River Light-house, haul to southward so as to pass ½ mile to the southward of it, then stand to the northward and bring the light-house to bear **W.**, distant about 200 yards: then steer about **N. ¼ W.** so as to leave Batchelor's Point about 500 yards on the starboard hand, and anchor as directed in the preceding paragraph.

EASTERN BAY AND TRIBUTARIES.†

Eastern Bay makes in to the northeastward on the eastern shore of Chesapeake Bay about 104 miles above Cape Charles, and 40 miles below Baltimore. It is a large, irregular body of water, with extensive shoals composed chiefly of oyster beds, and is the approach to several creeks and rivers navigable for vessels of less than 13 feet draught. **Kent Point**, the northern point at entrance, is marked by Bloody Point Bar Light-house. **Poplar Island**, on the south side of the entrance, is surrounded by shoals; these and the shoals making to the southward from Kent Point leave an available channel into the bay about 1 mile wide.

The villages and landings on the bay and its tributaries have considerable trade in farm produce and oysters, carried principally by steamers and sailing vessels engaged in the bay trade. Strangers seldom enter these waters. The shores of the bay are low and present no natural features readily distinguished by a stranger. Buoys mark the most prominent dangers and are the only guides to keep in the channel. Good anchorage is found anywhere in the bay in from 4 to 8 fathoms water, soft bottom, or in the mouths of the tributaries. Strangers bound up the bay or into any of the rivers or creeks are advised to take a pilot, as there are no aids except in the St. Michael's River.

Coxe's Creek empties into the bay from the northward about 2¾ miles to the northeastward of Kent Point. For a distance of 3½ miles above its mouth the least depth in the channel is 10 feet. **Shipping, Warehouse, and Thompson's** creeks are tributaries of Coxe's Creek, which can be entered by vessels of 7 to 9 feet draught. The channel is narrow and crooked, and is not marked; strangers should take a pilot at the entrance. There is a steamboat landing in Shipping Creek.

Crab Alley Creek empties into Eastern Bay from the northward just east of Coxe's Creek. The entrance to the creek between **Parson's Island** on the east and **Bodkin Island** on the west, is about 1¼ miles wide, but is much obstructed by shoals which make out from the shores. Crab Alley Creek is only frequented by local vessels carrying farm produce and oysters. Strangers should not enter without a pilot. There are no buoys or other aids.

Kent Island Narrows is a narrow passage between Kent Island and the main land, and is crossed by a bridge with a draw 60 feet wide. A channel about 100 feet wide and 7 feet deep was dredged through this passage in 1877, under the supervision of the U. S. engineers, but since then this depth has decreased, and only small craft now use this passage. The approach to Kent Island Narrows from Eastern Bay, is through a large bight in the northeastern end of the bay. This bight has a narrow channel, with a least depth of 8½ feet until up to the bar, which is off the southern end of the narrows. There are no aids, and strangers should take a pilot.

Greenwood Creek is a small, unimportant creek emptying into the eastern end of the bay from the northeast-

† Shown on Coast and Geodetic Survey charts **135**, scale $\frac{1}{80,000}$, and **376**, scale $\frac{1}{400,000}$, price of each $0.50.

ward. It has about 3½ feet of water on the bar at its entrance, and 6½ to 10 feet in the channel for a distance of 2 miles above its mouth.

Wye River empties into the eastern end of the bay about SE. by E. ½ E. from Tilghman's Point. This river has several branches, called the **Front Wye, Back Wye, and Big Wye**; these again have numerous small tributary creeks of no special importance. The channels of the Wye River and its branches are narrow and crooked and require local knowledge for their navigation. Vessels drawing from 6 to 9 feet, engaged in the bay trade, enter the river for cargoes of farm produce and cordwood. Strangers seldom enter, and should not attempt it without a pilot.

ST. MICHAEL'S RIVER,

emptying into the head of the bay from the southeastward, is the most important of the tributaries of Eastern Bay, and is the approach by water to the town of St. Michaels. The entrance of the river is obstructed by shoals between which a narrow and crooked, but well-buoyed channel leads up to the town of St. Michaels. A draught of 10 feet can be taken up the river 5 miles above the town. There are several creeks which empty into St. Michaels River and are navigable for vessels of less than 10 feet draught; the most important is **Leeds Creek**, opposite the town of St. Michaels, which has a steamboat landing. Its entrance is marked by two buoys.

St. Michaels is a small town on the west bank of the river about 7 miles above Tilghman's Point, and 14 miles from the entrance to Eastern Bay. It has considerable trade in farm produce and oysters, carried principally in steamers and sailing vessels engaged in the bay trade. The greatest draught taken up to the town is 13 feet, but the vessels trading here and to the landings on the river and its tributaries are usually of 6 to 10 feet draught. There is a marine railway and ship yard at St. Michaels at which many vessels repair; the cradle of the railway is 123 feet long and 23 feet wide.

During the summer a steamer from Baltimore makes trips, stopping at landings on the river up to the bridge, about 7 miles above St. Michaels. Strangers entering the river, if drawing over 10 feet, should take a pilot, coming to anchor in Eastern Bay or at the mouth of St. Michaels River, with signal set, until boarded by one.

SAILING DIRECTIONS, EASTERN BAY AND ST. MICHAEL'S RIVER.

Although 22 feet can be taken in to an anchorage in Eastern Bay, it is seldom entered by any but vessels of 10 feet or less draught engaged in the local trade of the tributaries of the bay.

1. ***Approaching and Entering Eastern Bay.—From the Southward.***—Having followed the directions in Section 5, pages 30–31, "Sailing Directions, Chesapeake Bay," when Bloody Point Bar Light-house is made bring it to bear **N NE. ¼ E.** and run for the light-house on that bearing until the northern extremity of Poplar Island bears **E SE. ½ E.**, then change the course to **NE.** by **E. ¼ E.** This course made good will lead about midway between Poplar Island Spit buoy (spar, red, No. 2) and Kent Island Spit buoy (can, black, No. 1), and directly up to Bodkin Island Shoal buoy (spar, black, No. 3). Pass close to the southward of black buoy No. 3, and steer **NE.** On this course Tilghman's Point Shoal buoy (spar, red, No. 4) will be made on the starboard bow; leave it about ¼ mile on the starboard hand, and if bound up the St. Michaels River, be guided by the directions in Section 2, following.

After entering the bay, if bound up any of the tributaries other than St. Michaels River, or if drawing over 10 feet, take a pilot.

Remarks.—In standing **N NE. ¼ E.** for Bloody Point Bar Light-house, Kent Point will be a little on the staboard bow. Poplar Island will be left about 1½ miles on the starboard hand. On the **NE.** by **E. ¼ E.** course Tilghman's Point (well wooded to the end and quite prominent) will be seen in the distance a little on the starboard bow.

Dangers and Aids.—**Poplar Island Shoal** makes out 1¼ miles to the westward from Poplar Island, and its western edge, with only 9 feet of water over it, is marked by a 2d-class nun buoy painted red (see page 31).

Poplar Island Spit is a shoal, with 1 to 18 feet of water over it, making out a little over 2 miles in a northeasterly direction from the northern end of Poplar Island. The northern extremity of this spit is marked by a red spar buoy, No. 2. On the eastern side of Poplar Island shoals extend to the mainland.

Shoals make out in all directions from Kent Point; the western edge of these shoals is marked by **Bloody Point Bar Light-house** (see table, page 18), and the southern edge by Kent Point Shoal buoy (can, black, No. 1).

On the northern side of the bay, between the entrances to Coxe's Creek and Crab Apple Creek, there is an extensive shoal ground, which extends about 2 miles to the southward from Turkey Point and Bodkin Island; it is marked at its southern edge by Bodkin Island Shoal buoy (spar, black, No. 3). Abreast this buoy the channel is only ⅜ mile in width.

From the southern shore of the bay shoals make ⅛ to ¾ mile.

Wade's Point Shoal buoy (spar, red, No. 2½) marks the northern end of the shoals making off to the northward from Wade's Point; it is left nearly ⅜ mile on the starboard hand on the **NE.** by **E. ¼ E.** course.

Tilghman's Point Shoal buoy (spar, red, No. 4) marks the northern edge of the shoal making out ⅝ mile to the northward from Tilghman's Point.

1 A. ***Approaching and entering Eastern Bay.—From the northward.***—When abreast of Thomas' Point Shoal Light-house (see table, page 18) steer for Bloody Point Bar Light-house; pass ½ to 1 mile to the westward of it, and then haul gradually to the eastward. When about 1 mile south of Bloody Point Bar Light-house steer **E.** Kent Point Shoal buoy (can, black, No. 1) will be made on the port bow, and Poplar Island Spit buoy (spar, red, No. 2) on the starboard bow; pass about midway between these buoys and then steer **NE.** by **E.** ¼ **E.** When Bodkin Island Shoal buoy (spar, black, No. 3) is made steer so as to pass close to the southward of it, and then steer **NE.** This course will lead about ¼ mile to the northward of Tilghman's Point Shoal buoy (spar, red, No. 4); from it, if bound up St. Michael's River, be guided by the directions in Section 2, following.

Note.—See Remarks and Dangers under Section 1.

2. ***From Tilghman's Point up the St. Michael's River.***—The channel of the river as far up as the town of St. Michael's has a depth of 21 feet, but it is so narrow and crooked that strangers of over 10 feet draught should take a pilot.

Having followed the directions in Section 1, or 1 A., preceding, until up to Tilghman's Point Shoal buoy, pass about ¼ mile to the northward and eastward of it and then steer **SE.** ⅞ mile for *Coffee Point Shoal buoy* (spar, black, No. 5), which should be left about 200 yards on the port hand. When this buoy bears **N NE.** steer **S.** ½ **E.** This course will lead up to *Bozman's Island Shoal buoy* (spar, red, No. 6); pass about 80 yards to the eastward of it and then steer about **S.** by **W.** ½ **W.** so as to pass about 60 yards to the westward of the black buoy (spar, No. 7), which will be seen to the southward.

Continue the **S.** by **W.** ½ **W.** course until well to the southward of black buoy No. 7, then haul to the eastward and steer about **SE.** by **E.** for *Hamilton's Point Shoal buoy* (spar, red, No. 8), which leave about 25 yards on the starboard hand and then steer **S SE.** ⅛ **E.**.

On the **S SE.** ⅛ **E.** course *Scotland Point Shoal buoy* (spar, red, No. 10) will be nearly ahead; pass about 25 yards to the northward and eastward of this buoy and then steer **S.** ½ **W.** Pass close to *Fairview Point Shoal buoy* (spar, black, No. 9), and then steer **S.** ¾ **E.** for *Stony Point Shoal buoy* (spar, red, No, 12). Leave red buoy No. 12 about 100 yards on the starboard hand and steer **SW.** ½ **W.** for about ½ mile. The last course and distance will lead to abreast the town of St. Michael's where anchorage in 16 to 22 feet of water will be found.

If bound farther up the river take a pilot or be guided by the buoys and chart.

Remarks.—Shoals make out from both sides of the river, leaving the channel quite narrow in places. A detailed description of these shoals that would be of use to vessels navigating the river cannot be given. The chart and buoys must be the principal guides.

CHESTER RIVER †

empties into the eastern side of Chesapeake Bay, about 134 miles above Cape Charles and opposite the mouth of the Patapsco River; it is important as the approach, by water, to the towns of Queenstown, Centreville, Chestertown, and Crumpton, and to numerous small villages and landings which have a considerable trade in farm produce cord-wood, and timber. Kirby's landing, about 39 miles above its mouth, is the head of navigation, and Crumpton, about 36 miles above its mouth, can be reached by vessels of 8 to 9 feet draught, through a channel 120 feet wide and 8 feet deep, which was dredged under the supervision of the U. S. Engineers in 1880.

The deepest draught of vessels trading in the river is 9 to 15 feet, and the usual draught 6 to 8 feet. Numerous small creeks empty into the river, some of which are navigable for vessels of 8 feet draught, and are entered by the class of vessels trading in the bay. The entrance of the river, marked by Love Point Light-house, is somewhat obstructed by a long shoal making out to the northeastward from Love Point and the shoals which make out from the west shore of Eastern Neck and Eastern Neck Island. The most prominent dangers in the river and the dredged channel below Crumpton are marked by buoys.

The channel leads from the northward into the river, and has a least depth of 19 feet at the entrance; this depth can be taken to the mouth of Southeast Creek, a distance of 25 miles, but the channel for a greater part of this distance is narrow and crooked and has several detached spots above Queenstown with 14 to 18 feet over them.

†Shown in parts on Coast and Geodetic Survey charts 135, 136, scale of each $\frac{1}{80,000}$, price of each $0.50; and 376, scale $\frac{1}{400,000}$, price $0.50. The entrance of the river is also shown on chart 388, scale $\frac{1}{40,000}$, price $0.25.

Though the channel is well buoyed a stranger should not go above Queenstown without a pilot. A draw-bridge crosses the river at Chestertown and another at Crumpton; the draw of the latter has a width of 37½ feet. The channels leading into several of the tributaries of the river are marked by buoys, but as a rule they are narrow and require local knowledge for their navigation.

Kent Island Narrows, about 5 miles above Love Point Light-house, is described under the heading "Eastern Bay." The approach from Chester River is over a bar with only 3 feet of water on it.

Jackson's Creek, in the south shore, about 6 miles above Love Point Light-house, has a buoyed channel with about 7 feet of water.

Queenstown Creek, or **Queenstown Harbor**, on the east side of the river, about 9 miles above its mouth, is the harbor for the town of **Queenstown**. The depth of water in the creek (inner harbor) is 9 to 10 feet, and is reached through a channel 100 feet wide and 8 feet deep, which was dredged under the supervision of the U. S. Engineers, in 1880, from the deep water of the river channel into the creek. Queenstown has considerable trade in farm produce and oysters, carried in sailing vessels and steamers engaged in the bay trade.

Corsica Creek, on the east side of the river, about 15 miles above Love Point Light-house, is the approach to the town of **Centreville**, which is about 5 miles above the mouth of the creek. **Centreville Landing**, about 1 mile below the town, is the head of navigation on the creek and is reached through a dredged channel 80 feet wide and 8 feet deep. Steamers and sailing vessels engaged in the bay trade make landings on the creek as far up as Centreville Landing. The channel in the creek and at its entrance is marked by buoys. Strangers should not enter without a pilot.

Gray's Inn Creek, on the west side of the river, nearly opposite the entrance to Corsica Creek, is of little importance; some farm produce is shipped in vessels engaged in the bay trade from the farms on its shores. The channel has 8 to 12 feet of water for a distance of 2½ miles above its mouth. The buoys to the eastward of the entrance mark the channel into Langford Creek.

Langford Creek (**Lankford's Bay**), on the west side of the river opposite Corsica Creek, has several small creeks and two forks which are navigable for the class of vessels engaged in carrying farm produce. The channel into the creek is marked by several buoys, but it is seldom used by strangers. The last buoy is placed about 1 mile above the eastern point of entrance; above this there are no aids and the channel is narrow and crooked.

Chestertown is a thriving town on the west bank of the river, about 28 miles above Love Point Light-house. At this point the river is crossed by a draw-bridge. Steamers from Baltimore and sailing vessels are engaged in the carrying trade from Chestertown. The depth in the channel up to the town is 10 feet.

Crumpton is a small town about 8 miles above Chestertown; it has some trade, carried principally in steamers to Baltimore. The depth in the channel to Crumpton is 8 feet. A draw-bridge crosses the river at Crumpton; width of draw 37½ feet.

Kirby's Landing is about 3 miles above Crumpton and is the head of navigation; small vessels with a draught of 5 feet can come to the landing.

There are numerous landings on the river and its tributaries at which the steamers stop and sailing vessels load during the season when fruit and produce is shipped.

Tow-boats are only used during the fruit season.

Strangers bound above Queenstown or into any of the tributaries of the river should take a pilot, making signal for one while below Queenstown, or come to anchor in the entrance with signal set until one comes off from the shore. Persons competent to take a vessel up the river will be found living on its shores. There are no regular licensed pilots.

The mean rise and fall of **tides** in Chester River is about 1.6 feet.

SAILING DIRECTIONS, CHESTER RIVER.

The following directions are available for vessels of 15 feet draught as far as Queenstown.

1. ***Approaching and entering.—From the southward.***—Pass ¼ to 1¾ miles to the eastward of Sandy Point Light-house (see table, page 20), and when it bears **SW.** steer **NE.**, keeping the light-house on the bearing astern. When Love Point Light-house (see table, page 20) bears **SE.** steer **E.** by **S.** Continue this (**E.** by **S.**) course past Love Point Shoal buoy, leaving it about ¼ mile on the starboard hand, and when Love Point Light-house bears **SW.** by **W.**, distant 1 to 1½ miles, steer **S.** by **W.** ½ **W.** and be guided by the directions in Section 2, following.

Vessels of less than 10 feet draught may run across Love Point Shoal anywhere to the northward of Love Point Light-house, and those of less than 7 feet draught can cross the shoal by passing about 500 yards to the southward of the light-house.

Remarks.—On the **NE.** course the river will be gradually opened out to the southeastward. On the **E.** by **S.** course the tendency of both the flood and ebb currents will be to set a vessel to the southward, toward Love Point Shoal.

As Love Point Shoal buoy is approached, the Junction buoy and others marking the channel into Rockhall and Swan creeks may be seen to the northeastward.

Dangers and Aids.—**Shoals** make out ½ to 1 mile from the western shore of Kent Island, and near their edge the water shoals abruptly in some places from 12 or 15 fathoms to 17 or 18 feet.

Love Point Shoal makes out 2 miles in a northeasterly direction from Love Point and is marked near the northern end by Love Point Shoal buoy (spar, red, No. 2). **Love Point Light-house** (see table, page 20), the principal aid in entering Chester River, is a little over 1 mile **NE.** from Love Point and is near the middle of the shoal.

Extensive Shoals make out to the southward and westward from Swan Point and from the mouths of Swan, Rockhall, and Huntingfield creeks. The southern extremity of these shoals is marked by Junction buoy (spar, red and black horizontal stripes); between this buoy and Love Point Shoal buoy the channel into Chester River is about 1 mile in width.

1 A. ***Approaching and entering.—From the northward.***—Pass at least two miles to the westward of Swan Point, leaving Swan Point Shoal buoy (spar, red, No. 22), marking the western edge of Swan Point Shoal on the port hand. When Love Point Light-house is brought to bear to the eastward of **S.** by **E.** ½ **E.** run for it, and when between 1½ and 3 miles from the light-house haul gradually to the eastward so as to pass about 1 mile to northward of it. Leave Love Point Shoal buoy (spar, red, No. 2), which will be seen about ¾ mile to the northeastward of the light-house, about ¼ mile on the starboard hand, and then steer about **E.** by **S.** until Love Point Light-house bears **SW.** by **W.**, distant 1 to 1½ miles, when be guided by the directions in Section 2, following.

See Remarks and Dangers under Section 1, foregoing.

2. ***From the entrance to Queenstown.***—With Love Point Light-house bearing **SW.** by **W.**, distant 1 to 1½ miles, steer **S.** by **W.** ½ **W.** for about 3 miles. Wickes' Beach buoy (spar, black, No. 1) will be made on the port bow and left on the port hand, and Kent Island Shoal buoy (spar, red, No. 2½) will be made on the starboard bow. When buoy (red, No. 2½) bears **NW.** by **W.** ¼ **W.** steer **SE.** by **E.** ¼ **E.** On this course Long Point Shoal buoy (spar, red, No. 4) should be left 200 to 300 yards on the starboard hand and Cockey's Island Shoal buoy (spar, black, No. 3) and Cedar Point Shoal buoy (spar, black, No. 5) about the same distance on the port hand. When the latter buoy (No. 5) bears **N.**, steer **E.** by **N.** This course will lead up to Queenstown Creek Entrance buoy (spar, red, No. 2). To enter Queenstown Creek be guided by the buoys marking the dredged channel, or take a pilot.

If bound farther up the Chester River it is advisable to take a pilot. The following directions, if closely followed, will lead up to the entrance to Corsica Creek. When ¼ mile to the southward of Cedar Point Shoal buoy (spar, black, No. 5) steer **E NE.**, and when Hail Point Shoal buoy (spar, black, No. 7) is made change course to the northward so as to pass about ¼ mile to the eastward of it. When Hail Point Shoal buoy bears **W.**, distant about ¼ mile, steer **N.** by **W.** ¼ **W.** for about 2 miles. Piney Point Shoal buoy (spar, red, No. 6) should then be ahead, about ½ mile distant. Pass about 300 yards to the westward of this buoy, and then steer **NE.** by **N.** for 3 miles. This course and distance made good will lead ¼ mile to the eastward of the buoy (can, red and black horizontal stripes) at Langford Creek entrance and up to the buoy (nun, red, No. 8) at the entrance to Corsica Creek. Here there is a dredged channel, and local knowledge or a pilot is necessary.

Remarks.—**Eastern Neck Island** is a large island in a horse-shoe bend of the river east of Love Point, and is almost connected at its northern end with the mainland.

On the **S.** by **W.** ½ **W.** course, when Love Point Light-house bears about **W.**, another portion of Chester River will be visible across the low marsh-land of the northern end of Eastern Neck Island.

On the **SE.** by **E.** ¼ **E.** course the entrances to **Macums, Piney, Muddy,** and **Jackson's** creeks will be seen and passed on the starboard hand. These creeks are of but little importance; the entrance to Jackson's Creek is buoyed.

On the **E.** by **N.** course Queenstown Creek will be ahead. **Winchester** and **Wolsey** creeks, making into the southern shore, will be passed, and the northern stretch of Chester River will be opened out gradually from behind the southeastern part of Eastern Neck Island.

Dangers and Aids.—**Shoals** make out ⅝ mile to 1¼ miles from the western and southern shores of Eastern Neck Island. The extreme western point of these shoals is marked by *Wickes' Beach buoy* (spar, black, No. 1), lying 1⅝ miles **S SE.** ⅜ **E.** from Love Point Light-house. From this buoy the edge of the shoal extends 2½ miles in a **SE.** by **S.** direction to *Cockey's Island Shoal buoy* (spar, black, No. 3), then in a more easterly direction for 1⅛ miles to *Cedar Point Shoal buoy* (spar, black, No. 5), lying about 1 mile **S.** by **W.** ¾ **W.** from **Cedar Point,** the southern point of Eastern Neck Island.

Kent Island Shoal buoy (spar, red, No. 2½) lies 2⅛ miles **S.** ⅜ **W.** from Love Point Light-house and marks the eastern edge of the shoals making out ¼ to ½ mile from the shore to the southward of Love Point.

Shoals make out a little over 1 mile from the southern shore between Macums Creek and Jackson's Creek. *Long Point Shoal buoy* (spar, red, No. 4) lies on the northern edge of these shoals, 1¼ miles to the northward of Piney Creek.

Above Cedar Point shoals make out from ½ to ¾ mile from both shores of the river; the channel follows, approximately, the middle of the river.

SWAN CREEK AND ROCKHALL CREEK.†

These two small creeks are in the eastern shore of Chesapeake Bay, about 5 miles to the northward of Love Point Light-house; they have some local trade carried in small vessels and steamers from Baltimore. A buoyed channel leads from the entrance of Chester River, to the northward along the eastern edge of an extensive shoal which makes to the southward from Swan's Point, up to the entrance of the creeks. A draught of 8 feet can be taken to the landings, but some local knowledge is necessary to keep in the best water. The entrance buoy to the channel leading into the creeks is 1¾ miles **N NE. ¼ E.** from Love Point Light-house.

Sailing directions of practical value for entering the creeks cannot be given. *To make an anchorage off their entrance,* follow the directions for entering Chester River, and when Love Point Light-house bears **S SW. ¼ W.**, distant about 1½ miles, follow the buoys to the northeastward. Round the second black spar buoy that will be passed and steer about **N. ⅞ W.**, leaving a red spar buoy on the starboard hand when abreast of the entrance to Rockhall Creek. Anchor a short distance to the northward of this buoy in 12 to 18 feet water.

CHESAPEAKE BAY, ABOVE THE PATAPSCO RIVER.‡

Chesapeake Bay, above the mouth of the Patapsco River, extends in a general **NE.** direction about 30 miles to the mouths of the Susquehanna and Northeast rivers. A number of rivers and creeks empty into the bay from the eastward and westward; they are the approach by water to many landings and a number of towns and villages, of which the principal ones are Still Pond, Georgetown, Chesapeake City, Elkton, Charlestown, Northeast, Havre de Grace and Port Deposit.

The tributaries flow through a fertile agricultural country, which has a large trade in fruits, vegetables, grain, and hay, and also in lumber and ship-timber. Shipments are made principally in vessels engaged only in the bay trade, but coastwise vessels are also engaged in carrying cargoes from Havre de Grace and Port Deposit. A number of small steamers ply between the landings and villages and the cities of Baltimore and Philadelphia. The western approach to the Chesapeake and Delaware Canal is through Elk River and Back Creek, the former emptying into the bay about 24 miles above the mouth of the Patapsco River.

Numerous shoals make out from the shores, and other detached ones lie in the bay, but a good channel, marked by buoys, and two light-houses, with a least depth of 17 feet, favors the eastern shore and leads up to Turkey Point and into Elk River. Above Turkey Point a good channel, with a least depth of 14 feet, leads along the eastern shore to the mouth of Northeast River. To the westward of this channel are the extensive flats, through the western part of which a narrow, buoyed channel—improved under the supervision of the U. S. Engineers—having a depth of 12 feet at low water, leads into the Susquehanna River.

The bay is navigable for strangers of 13 feet draught as far as Turkey Point and into the mouth of the Elk River; if bound above this, or into any of the tributaries of the bay, a pilot should be employed. If bound to Havre de Grace or Port Deposit, vessels of 10 to 12 feet draught are advised to take a tug or pilot.

Pilots are usually fishermen, who will be found in the bay. **Tow-boats** can be had from Havre de Grace, or at the mouth of the Patapsco River.

BACK RIVER, HAWK COVE, MIDDLE RIVER, AND GUNPOWDER RIVER

empty into Chesapeake Bay from the westward, between the rear light of the Craighill Channel range and Pool's Island Light-house. They have a common entrance, which is 3 miles **W. ½ S.** from Pool's Island Light-house and leads between **Spry's Island** on the north and **Miller's Island** on the south. These waters are of little commercial importance; they are only frequented by vessels engaged in the bay trade and by sportsmen in the shooting season. A stranger over 5 feet draught should not enter without a pilot. **Back River**, the southernmost of these waters, is entered through **Hawk Cove**; the latter lies to the northeastward of the entrance and just to the southward of the mouth of **Middle River**. A few vessels from Baltimore enter Back and Middle rivers to load fertilizers, oyster-shells, and wood; 8 feet can be taken about 2 miles above their entrances. **Gunpowder River** is the northernmost of these tributaries. A narrow, deep, but crooked channel leads from the common entrance into the mouth of this river, but above its mouth the river is shallow and has only 7 feet at low water for a distance of 3 miles; above this and up to the P., W. & B. R. R. bridge, which crosses the river 5½ miles above its mouth, the depth is 5 and 6 feet.

Fairlee Creek is a small and unimportant stream, with a very narrow entrance, emptying into the bay on the eastern shore, 3 miles **SE.** by **E. ½ E.** from Pool's Island Light-house.

WORTON CREEK

empties into the bay on the eastern shore about 2 miles to the northeastward of Fairlee Creek and **E.** from Pool's Island Light-house. Considerable farm produce and fruit are shipped from this creek during the season. It is a good, though small, anchorage for vessels of 8 feet or less draught. Extensive flats, with 8 to 10 feet of water over them, extend to the westward 1½ miles, from the mouth of the creek to the edge of the channel

† Shown on Coast and Geodetic Survey chart **136**, scale $\frac{1}{80,000}$, price $0.50.

‡ Shown on Coast and Geodetic Survey charts, **136**, scale $\frac{1}{80,000}$, price $0.50; **376**, scale $\frac{1}{400,000}$, price $0.50.

in the bay; these flats are good anchorage in easterly winds. Inside the mouth of the creek good anchorage, sheltered from all winds, is found in 8 to 13 feet water. There are no aids to assist a stranger in entering. (See sailing directions following, in Section 1.)

BUSH RIVER

empties into the bay on the western shore, about 2¾ miles to the northward of Pool's Island Light-house. This river is shallow and full of flats, but is navigable for vessels of 8 feet draught for a distance of 4 miles above its mouth. A bridge of the P., W. & B. R. R., with a draw 24 feet wide, crosses the river nearly 7 miles above the entrance, and 6 feet of water can be carried ¼ mile above the bridge. Strangers should not enter without a pilot. There are no aids placed to mark the channel in the river or at the entrance. The rise and fall of tides is about 1¾ feet.

STILL POND

is a broad bight in the eastern shore of the bay, about 6½ miles **NE.** from Pool's Island Light-house. It has a depth of 10 feet, and affords good anchorage, sheltered from southerly and easterly winds, for vessels of 8 or 9 feet draught. At the head of the bight **Church Creek** empties into it from the southward and **Still Pond Creek** from the eastward. The village of **Still Pond** ships some farm produce in vessels engaged in the bay trade. The anchorage is easy of access to strangers, but the navigation of the creeks requires local knowledge and a light draught. There are no aids to assist a stranger in entering.

SASSAFRAS RIVER

empties into the bay on the eastern shore, about 10 miles **NE.** of Pool's Island Light-house and 5 miles to the southward of Turkey Point Light-house. There is a large trade along this river in farm produce, lumber, and coal, carried principally in vessels owned in the vicinity. Steamers ply between Georgetown and the river landings and Baltimore and Philadelphia. The deepest draught vessels trading in the river is 8 to 10 feet; this draught can be taken up to **Georgetown,** 9 miles above Grove Point, the northern point at entrance. **Betterton** is a village on the south shore of the entrance, about 2½ miles east of Howell's Point. The channel of the river is comparatively straight, but shoals make out from both sides, leaving the channel quite narrow in some places. There are no aids to assist a stranger, and a pilot should be taken by those who enter. The mean rise and fall of tides is 2.3 feet.

ROMNEY CREEK,

on the western shore, **W. ¾ N.** from Howell's Point, is of little importance. There is 5 feet of water on the bar at its entrance and a somewhat greater depth in the narrow, crooked channel of the creek. Strangers should not attempt to enter without a pilot.

ELK RIVER

empties into Chesapeake Bay from the northeastward, about 24 miles above the mouth of the Patapsco River. **Turkey Point Light-house,** on the southern end of Elk Neck (see table of light-houses, page 20), marks the western point at entrance. This river is navigable for vessels of 7 feet draught as far as the town of **Elkton,** 15 miles above its mouth. For a distance of 7 miles the channel follows a general mid-river course and has a depth of 16 feet; above this it shoals rapidly and is narrow and crooked, and should not be attempted by a stranger. **Elk River** and **Back Creek,** one of its tributaries, are the western approach to the **Chesapeake and Delaware Canal,** through which a draught of 9 feet can be taken. There are no aids on the river except a stake-light (see table, page 20) on the eastern shore, 5½ miles above Turkey Point Light-house.

Bohemia River is a tributary of Elk River, emptying into it from the eastward about 4 miles above Turkey Point. A draught of 7 feet can be taken up about 3½ miles above its mouth. There are no aids in the river, and a stranger should not enter without a pilot.

Back Creek is the most important tributary of Elk River, into which it empties from the eastward about 7½ miles above Turkey Point. **Chesapeake City,** about 4¾ miles above the mouth of the creek, is a small town at the entrance of the **Chesapeake and Delaware Canal.** The locks of the canal are 220 feet long, 24 feet wide, and allow a draught of 9 feet; the bridges crossing the canal are open draw-bridges and do not necessitate the striking of topmasts.

Elkton is a small town at the head of navigation on the Elk River. It is reached through a dredged channel about 1 mile long, 70 to 80 feet wide, and 7 feet deep, which was excavated under the supervision of the U. S. Engineers in 1880–1885. The town has several manufactories and some trade by water, shipments being made principally in vessels engaged in the bay trade.

Strangers of 8 to 10 feet draught can pass up the Elk River as far as the mouth of Back Creek by closely following the directions in this volume, or by studying the chart. If bound into any of the tributaries or to Elkton, take a pilot at Turkey Point.

NORTHEAST RIVER

empties into the head of Chesapeake Bay. The mouth of the river is about 5 miles **N. by E. ½ E.** from Turkey Point, and between the points at entrance is 1¼ miles wide. A channel, with a least depth of 14 feet, leads along the western

shore of Turkey Neck from the point to the entrance of the river. Above the entrance the width of the river first increases and then decreases to the town of Northeast, which is at the head of navigation, about 4½ miles above the mouth of the river. The channel above the entrance has a depth of 7 to 9 feet for a distance of 2½ miles, and above this a depth of 5 feet to the entrance of the dredged channel, which has a width of 60 feet and depth of 5 feet to the town of Northeast. The rise and fall of tides in the river is about 2 feet.

Charlestown is a small town on the west bank of the Northeast River, 2½ miles above its mouth. The deepest draught vessels trading here is 7 to 8 feet and the usual draught about 6 feet. **Northeast**, a small town at the head of navigation, about 2 miles above Charlestown, has several manufactories and some trade by water; the deepest draught of vessels trading there is 6 feet. It is on the line of the P., W. & B. R. R.

Strangers drawing 6 feet can enter Northeast River and pass up as far as Charlestown by close attention to the sailing directions in this volume, or by studying the chart. Local knowledge is required to pass above Charlestown, and a pilot should be taken there if bound to Northeast. Tugs are sometimes used and can be had from Havre de Grace.

SUSQUEHANNA RIVER

empties into the northwestern part of the head of Chesapeake Bay and is the approach by water to the towns of Havre de Grace and Port Deposit. Large quantities of lumber are rafted down the river and shipped from these towns. The river is approached through a narrow channel marked by buoys and Fishing Battery Light-house (see table, page 20); this channel has been improved by dredging, under the supervision of the U. S. Engineers, and was 100 feet wide and 12 feet deep at low water in 1885, the date of the last work. The entrance of the river, about 6¼ miles **N NW. ¼ W.** from Turkey Point Light-house, is marked on its western side by Havre de Grace Light-house and the town of Havre de Grace. At the upper part of the town, and just below Watson's Island, the river is crossed by a railroad draw-bridge, and ⅞ of a mile farther up another railroad draw-bridge crosses the river and the northern end of Watson's Island.

Havre de Grace, on the western point at entrance to the river, has considerable trade in coal, lumber, and sand, carried in coasting vessels and vessels engaged in the bay trade. The mean rise and fall of tides at Havre de Grace is 1.5 feet. **Port Deposit**, on the eastern shore of the river, about 4 miles above Havre de Grace Light-house, has considerable trade in hay, grain, ice, and lumber, carried in coasters and bay vessels. Tow-boats can be had at Havre de Grace, and should be taken by vessels bound to Port Deposit, as some difficulty may be experienced in going through the two railroad draw-bridges

SAILING DIRECTIONS FOR HEAD OF CHESAPEAKE BAY, ABOVE PATAPSCO RIVER ENTRANCE.

The following directions are good for a draught of 13 feet at any stage of the tide as far as Turkey Point Light-house, about 33 miles above Sandy Point Light-house. A draught of 18 feet can be taken this distance with a favorable tide and local knowledge.

1. ***From Sandy Point Light-house to abreast Worton Point.***—Having followed the directions in Section 6, "Sailing Directions, Chesapeake Bay," page 32, when Sandy Point Light-house bears **W.**, distant about ¾ mile, steer **N.** by **E.** ⅞ **E.** about 8¼ miles; Swan Point will then bear **E.** by **S.**, distant 1¾ miles. Then shape the course **NE.** ⅞ **N.**, and having stood on this course nearly 5 miles, leave Mitchell's Bluff buoy (spar, black No. 1) on the port hand. Continue the **NE.** ⅞ **N.** course about 1¼ miles above black buoy No. 1, and then steer **N NE. Easterly**, so as to pass about 1¾ miles to the eastward of Pool's Island and Light-house and ⅞ mile west of Worton Point.

To enter Worton Creek.—Vessels of 8 feet or less draught, when on the **N NE. Easterly** course, standing up the bay, bring Pool's Island Light-house to bear **W.** and steer **E.** for the entrance of the creek. Enter the creek, keeping midway between the points at the entrance, and anchor in 11 to 13 feet when inside.

Remarks.—The **N.** by **E** ⅞ **E.** course leads past two mid-channel buoys (spar, white and black perpendicular stripes) and about ¼ mile to the westward of Swan Point Shoal buoy. The numerous buoys marking the shoals off the entrance of Patapsco River and the dredged channel to Baltimore are left on the port hand. **Swan Point**, low and marshy, on the eastern shore, bearing about **E.** by **S.** from Seven-foot Knoll Light-house, will be left about 1¾ miles on the starboard hand. Swan Creek and Rockhall Creek are to the eastward of Swan Point. The **NE.** ⅞ **N.** course leads along the eastern shore and to the eastward of the extensive shoals lying in the middle of the bay below Pool's Island. **Mitchell's Bluff**, bare, abrupt bluff with level lands back of it, is about 5 miles above Swan Point. There is a large summer hotel to the southward of the bluff. On the **N NE. Easterly** course **Worton Point** (abrupt, with bare yellow bluff faces) is on the starboard bow and should be left ⅞ mile on the starboard hand. **Pool's Island**, low, with light-house on its northwestern point (see table, page 20), will be left about 1¾ miles on the port hand. Fairlee Creek and Worton Creek entrances will be passed before reaching Worton Point, and Worton Point Shoal buoy is left ⅜ mile on the starboard hand.

View of the Head of the Bay and Entrance to Elk River, Turkey Pt. bearing NE $\frac{3}{4}$ E, distant $3\frac{1}{4}$ Miles, and Sandy Pt. N. $\frac{3}{4}$ E, distant 2 Miles.

Dangers.—**Shoals** make out from the eastern shore below Swan Point for a distance of two miles; above Swan Point for a distance of 3 miles the eastern shore can be approached as near as $\frac{5}{8}$ mile. Abreast Mitchell's Bluff the shore can be approached to $\frac{3}{8}$ mile, but the water shoals very abruptly from 10 fathoms to 6 feet inside of $\frac{3}{8}$ mile from the shore. The large bight at the entrance to Fairlee and Worton creeks is full of shoals, with 5 to 15 feet of water over them, which extend out to the edge of the channel.

On the western side of the channel below Swan Point are numerous detached spot with depths of 6 to 17 feet of water over them; many of these are not marked. They are avoided by following the mid-channel buoys. About 3 miles above Swan Point, on the western side of the channel, is a large shoal, with spots having a depth of 6 to 12 feet over them; it extends to the northward and eastward in a broken line nearly up to Worton Point and to the eastward of Pool's Island. *Mitchell's Bluff buoy* (spar, black, No. 1) marks a 9-foot spot on the western side of the channel, about $4\frac{3}{4}$ miles above Swan Point. *Middle Ground buoy* (spar, black, No. 3) is on the eastern edge of a shoal with 8 to 12 feet water over it, and about $2\frac{1}{4}$ miles **S. by E. $\frac{3}{4}$ E.** from Pool's Island Light-house. To the eastward of Pool's Island, and on the west side of the channel are three spar-buoys which mark a narrow channel through the shoals east of the island; this channel is the most direct for vessels trading between Baltimore and the head of the bay.

Worton Point Shoal lies to the northwestward of Worton Point; it has spots with 6 to 11 feet of water over them, and its western edge is marked by a buoy (nun, red, No. 2). Abreast of this buoy the channel is about $\frac{5}{8}$ mile wide, and on its western side are the extensive shoals which make off from the western shore and the mouth of Bush River.

2. ***From Worton Point to Turkey Point.***—Passing $\frac{7}{8}$ mile west of Worton Point, as directed in Section 1, preceding, leave Worton Point Shoal buoy (nun, red, No. 2) about $\frac{1}{4}$ mile on the starboard hand, and when the buoy bears **S.**, distant about $\frac{3}{8}$ mile, shape the course **NE. by E. $\frac{1}{4}$ E.**; this course continued for $11\frac{1}{2}$ miles will lead into the entrance to Elk River, and about $\frac{3}{4}$ mile to the southward of Turkey Point Light-house.

I. If bound up Elk River to the mouth of Back Creek.—These directions are good for a draught of 12 feet in the daytime, but 9 feet is the deepest draught that can be taken into Back Creek. Continue the **NE. by E. $\frac{1}{4}$ E.** course as directed in the preceding paragraph, passing south of the wreck buoy off Turkey Point, and when Turkey Point Light-house bears **NW.**, distant $\frac{5}{8}$ mile, steer about **NE. $\frac{1}{2}$ E.**, keeping in the middle of the river. When 2 miles above Turkey Point Light-house, *Cabin John's Creek* will be open on the starboard hand, and $1\frac{3}{4}$ miles farther up Bohemia River entrance will be open on the starboard hand. Nearly $1\frac{1}{4}$ miles above *Town Point*, the northern point at entrance to Bohemia River, is a wharf and **stake-light** (see table, page 20). Round the stake-light, leaving it 300 to 400 yards on the starboard hand, and when it bears about **S.**, steer about **E. $\frac{3}{4}$ N.** *Old Field Point* is the next point on the north shore about $\frac{3}{4}$ mile above the stake-light; when this point is well abaft the port beam, haul to the northward so as to leave *Court House Point*, the next point on the south shore, about 200 yards on the starboard hand. Anchor in the channel just to the northward of Court House Point, off the mouth of Back Creek.

II. If bound up the Northeast River.—From Worton Point Shoal buoy, steer **NE. by E. $\frac{1}{4}$ E.** about 9 miles, until Bear Point bears **NW. by W. $\frac{3}{4}$ W.**; then steer **N NE. $\frac{1}{2}$ E.**, so as to pass a little over $\frac{1}{2}$ mile to the westward of Turkey Point Light-house. Continue the **N NE. $\frac{1}{2}$ E.** course above Turkey Point, giving the eastern shore a berth of $\frac{3}{8}$ mile until abreast of Red Point, the entrance to Northeast River. Vessels of 6 feet or less draught can follow a mid-river course to Charlestown.

III. If bound up the Susquehanna River.—These directions are good for vessels of 11 feet draught in the daytime. Steer **NE. by E. $\frac{1}{4}$ E.** for 9 miles from Worton Point Shoal buoy (nun, red, No. 2), and when Bear Point bears **NW. by W. $\frac{3}{4}$ W.**, then steer **N. $\frac{1}{2}$ W.** until Fishing Battery Light-house bears **NW. $\frac{1}{2}$ N.** Anchor and await a pilot or tow-boat.

Vessels of 7 feet or less draught can, in day-light, with a leading wind, follow the buoys up to Havre de Grace. The cut through the shoals is not regular, and the buoys must be closely followed.

Remarks.—On the **NE. by E. $\frac{1}{4}$ E.** course, **Howell's Point** (thickly wooded, trees ending abruptly), the southern point at entrance to Sassafras River, about $4\frac{3}{4}$ miles above Worton Point, will be on the starboard bow and left about $\frac{1}{4}$ mile on the starboard hand. **Still Pond Harbor** will be passed about midway between Worton Point and Howell's Point. When up to Howell's Point, Sassafras River entrance will be opened to the eastward and **Turkey Point Light-house**, on the southern end of Elk Neck (see table, page 20), should be made a little on the port bow; Elk River entrance will be right ahead. **Spesutie Island**, a large, low island on the western side of the bay opposite Turkey Point Light-house, is separated from the main land by a shallow body of water (**Spesutie Narrows**); **Bear Point** is the southern point of Spesutie Island, and bears about **W. $\frac{3}{4}$ S.** from Turkey Point Light-house. On the **N NE. $\frac{1}{2}$ E.** course, standing for the entrance to Northeast River, **Turkey Point** and Light-house (see table, page 20) will be on the starboard bow, and **Rocky Point**, a high, steep point about $2\frac{3}{4}$ miles above Turkey Point, will be a little on the starboard bow and is left $\frac{1}{4}$ mile on the starboard hand. **Turkey Point**, seen from the southward, is high and

mostly wooded, with several noticeable bare patches about half-way up the hillside. **Red Point**, the eastern point at entrance to Northeast river, is 5 miles above Turkey Point.

On the **N. ½ W.** course for the Susquehanna River, the eastern shore of Spesutie Island should be given a berth of ⅝ mile. **Fishing Battery Light-house** (see table, page 20) will be open to the eastward of **Locust Point**, the northeastern point of Spesutie Island, and the town of Havre de Grace and **Havre de Grace Light-house** will be a little on the port bow. Approaching the northeastern point of Spesutie Island, Locust Point Shoal buoy will be made and the spar-buoys marking the cut up to the mouth of the Susquehanna will be seen to the northwestward.

Dangers.—To avoid the shoals making from the eastern shore between Worton Point and Howell's Point, keep to the northward of a line drawn from Worton Point Shoal buoy (nun, red, No. 2) to Howell's Point. The northern side of Howell's point is bold to.

Shoals make off from the western shore between Bush River entrance and Spesutie Island. The channel follows the eastern shore. **Shad Battery Shoal**, off the western shore, about 2¾ miles above Worton Point, is marked at its eastern edge by a buoy (spar, black, No. 5). There is a 9-foot spot ½ mile **SE. ½ S.** from the buoy, and an 8-foot spot about 1⅝ miles **E. ¾ N.** from the buoy. Above Howell's Point the western shore should receive a berth of 2 miles until well above the entrance to Sassafras River.

Shoals make off to the southward from Turkey Point for a distance of ⅝ mile; a wreck buoy (spar, red and black horizontal stripes) is on the southeastern edge of the shoal.

The head of the bay above Turkey Point is one large shoal with 2 to 10 feet of water over it. A comparatively narrow channel leads into Northeast River and another into the Susquehanna River. The channel leading into the Susquehanna River is well marked by a number of buoys, and by Fishing Battery and Havre de Grace Light-houses.

APPENDIX I.

PILOTS AND PILOTAGE, HARBOR CONTROL QUARANTINE, ETC.

VIRGINIA.

Extracts from Virginia Pilot Law, passed by the General Assembly of Virginia, April 19, 1882.

PILOTS.

8. If any pilot-boat shall not have her name and the port to which she belongs marked ten feet below the head of her foresail on each side, in letters at least nine inches long, the owners thereof shall have no fees of pilotage, except in case of steam pilot-boats, which shall have her name on each bow instead of on her foresail.

12. The master of every vessel (other than a coasting vessel having a pilot license) inward bound from sea shall take the first Virginia pilot that offers his services, Cape Henry bearing west of south, to Smith's Point, Yorktown, Newport News or Norfolk, or any intermediate point; and any such vessel outward bound shall take the first pilot that offers his services at Smith's Point, Yorktown, Newport News or Norfolk, or any intermediate point to sea; and any master refusing to do so shall immediately pay to the said pilot full pilotage from the sea to Newport News, Smith's Point, Yorktown, or Norfolk, or from said ports to sea, as the case may be; but no master of a vessel coming from sea shall be compelled to take a pilot after arriving within the line at which Cape Henry bears west of south.

Provided further, that any registered vessel arriving within the line of Cape Henry, bearing west of south, without having taken a pilot, bound for Norfolk, Newport News or Richmond, shall not be liable for pilotage, but the master may pilot his own vessel to Hampton Roads, and then employ any steamboat or tow-boat to tow his vessel to her port of destination but in no instance will any master be allowed to employ any steamboat or tow-boat below Hampton Roads without paying full pilotage to the first regular pilot that offers his services to said vessel; and any master so employing any steamboat or tow-boat below Hampton Roads without a pilot on board of such vessel, when one shall have offered his services, shall be liable to the penalties prescribed in section 10 of this act. This proviso applies only to inward bound vessels.

13. No master shall be required to have a pilot to conduct his vessel or steamboat above Newport News, Yorktown, Mobjack Bay, Urbana or Smith's Point, but he may, by himself or by any person regularly employed on board, pilot his own vessel, or he may employ the services of any tow-boat to tow his vessel to her port of destination above any of the above-named points.

14. Pilots shall appoint agents one for Norfolk city and one for Richmond, who shall grant licenses to coasting vessels trading in the waters of this commonwealth, for which licenses such agents shall receive ten cents per ton for one year; and coasting vessels having such licenses shall be free to sail without pilots to or from sea, but all vessels sailing under a coasting license of the burden of seventy tons or more, coming from or going to sea, not having obtained a license from such agent, shall be subject to the same regulations and pilotage as registered vessels belonging to citizens of the United States.

15. The master of any coasting vessel wanting a pilot to any port in this State shall signify it by a signal at his foremast or foretop-mast head, whereupon a pilot shall repair to and pilot said vessel.

16. Pilots shall have pilotage at the following rates: For every vessel owned by citizens of the United States, and for any vessel owned by a citizen or subject of any foreign State, whose vessels are by treaty placed on the same footing as vessels of the United States, if the vessels be spoken or boarded to the eastward of Cape Henry, there shall be paid for each foot the vessel draws as follows: From sea to Smith's Point, West Point, Newport News, Norfolk, or any place between Smith's Point, West Point, Newport News or Norfolk, vessels drawing ten feet and under, two dollars and fifty cents; vessels drawing thirteen feet and over ten feet, three dollars; vessels drawing fourteen feet and over thirteen feet, three dollars and fifty cents; vessels drawing sixteen feet and over fourteen feet, four

dollars; vessels drawing over sixteen feet, four dollars and fifty cents. If the vessel shall be boarded or spoken twenty miles or more eastward of Cape Henry, twenty-five cents per foot shall be added to the foregoing rates. There shall be paid the same pilotage from Smith's Point, West Point, Newport News, or Norfolk, or any intermediate point to sea, as from sea to those places; and from Newport News to Jamestown, or any place between Newport News and Jamestown, one dollar and thirty-five cents per foot; from Newport News to Richmond, or any place between Jamestown and Richmond, two dollars and fifty cents per foot, and the same rates of pilotage shall be paid from said places respectively down. Vessels coming from sea to Hampton Roads, and thence to any port in Maryland, shall be subject to the same rates of pilotage as vessels bound from Newport News to sea. All vessels coming to Hampton Roads seeking, in ballast, shall only pay one-half pilotage in and one-half out; provided, however, that if such vessel coming to Hampton Roads seeking is afterwards chartered to load in any port or place in this State, she shall pay the usual pilotage in and out as though she had come to a direct port. All steamers calling in any port or place in this State for the sole purpose of coaling shall only pay one-half pilotage in and one-half pilotage out. All vessels that go from Norfolk to Newport News to load or to finish loading, and all vessels that go from Newport News to Norfolk to load or finish loading, shall, if they take a pilot, which shall be optional with the master, pay a fee of ten dollars to the pilot for transporting any such vessel to or from either place.

19. Any pilot who shall attend any vessel with his boat, at the request of the master or owner, shall have fifty dollars per day, and any master carrying any pilot to sea, shall pay him wages at the rate of seventy-five dollars per month.

20. If any vessel having no pilot on board follow another that has a pilot, such pilot shall have pilotage for the vessel so following.

21. Any pilot being detained on board any sea-going vessel shall be entitled to three dollars for each day he may be so detained, to be paid by the master, owner, or consignee of such vessel. If any such pilot be carried beyond the limits of his state against his will, he shall be entitled to recover the sum of three hundred dollars from the master or owner of the vessel upon which he may have been carried away. All vessels having a branch pilot and arriving at the pilot station, shall remain there fifteen hours, if required, to give such pilot an opportunity to be taken off, under a penalty of fifty dollars.

23. The first pilot who meets a vessel coming in which his branch entitles him to conduct, shall have the right to take charge of and conduct her into York River, Hampton Roads, Newport News, Norfolk, Mobjack Bay, Urbana, or Smith's Point, aforesaid, and to receive the pilotage allowed by law; but any pilot that boards a vessel off any vessel other than his boat, shall give the same up to the first authorized pilot that offers his services from a lawful Virginia pilot-boat anywhere below the Thimble Light; and the master of any such vessel employing a pilot from any other than a lawful Virginia pilot-boat, shall be liable to the first regularly licensed pilot who offers his services from a lawful pilot-boat of this State anywhere below Thimble Light.

26. Pilots may state their accounts, verified by affidavits, and lodge them with their agents in Norfolk, Richmond, Newport News, or Yorktown, or wherever they may think it necessary to appoint such agent for collection; and if any person liable on any such account shall fail to pay the amount thereof to the agent or the pilot himself within three days after demand made, he shall pay five dollars (in addition to said amount) to said pilot.

27. The board of commissioners may decide any controversy between pilots to whom it has granted branches, or between any such pilots and the master, owner, or consignee of any vessel which may arise under any law concerning pilots. Its decision shall be final. If such decision requires the payment of money, the board shall enter a judgment therefor, on the record of its proceedings; and on a copy thereof being put into the hands of any sheriff, constable, or sergeant, he shall enforce payment thereof as if it were an execution against the property of the debtor, and have the same fee.

29. Nothing herein shall authorize such board to decide upon the liability of a pilot or his apprentice to any party injured by his negligence or misconduct, or to prevent such party from recovering for all damages occasioned thereby.

35. Any pilot first meeting a vessel coming from sea shall inquire into the health of her crew and the place from which she last came, and if she has a dangerous or infectious disease on board, or comes from any place from which vessels are required to perform quarantine in this State, or any port thereof, he shall direct said vessel to follow his boat, and carefully conduct her to the nearest place appointed for vessels to quarantine, and shall, as soon as possible, give notice thereof to the health officer of the port nearest thereto, for which service said pilot shall be entitled to an extra fee of seven dollars beyond the regular fees of pilotage, to be paid by the master or owner of said vessel; and if any pilot shall be permitted to go on board a vessel without being informed of contagious disease being on board, and be obliged to remain on board, or perform quarantine in consequence thereof, he shall have three dollars for every day's detention, to be paid as aforesaid.

37. Nothing in this act shall be deemed to apply to vessels bound for any point on the Potomac,

and no vessel bound to or from any point on the Potomac shall be required to pay pilotage. But if she does take a pilot she shall pay the regular rate to Smith's Point.

38. This act shall be in force from its passage.

Extracts from the Act of the General Assembly, creating the Board.

BOARD OF HARBOR COMMISSIONERS OF NORFOLK AND PORTSMOUTH.

1. * * * For the purpose of preserving and improving the harbor of Norfolk and Portsmouth, seven commissioners shall be appointed by the Governor—three residents of the city of Norfolk, two of the city of Portsmouth, and two of the county of Norfolk.

2. * * * The said commissioners shall be a board to be known as The Board of Harbor Commissioners of Norfolk and Portsmouth, * * * .

3. * * * The said board of harbor commissioners shall have full power to regulate and define the port warden's line along the water-front of the cities of Norfolk and Portsmouth, and the Elizabeth River and branches thereof, for five miles above and below the limits of said cities. * * * The said board, or a majority of them, shall have the authority to cause the removal of any wharf, dock, wreck, or other obstruction to navigation, or that may, in their opinion, be injurious to the harbor, at the expense of the owner or owners, or the parties causing the obstructions; provided the rights of any owner or owners of wharves, whose lines have heretofore been fixed by authority of State legislation, are in no wise to be disturbed.

6. * * * The said board of harbor commissioners shall have power to make and enforce such rules and regulations for the preservation of the harbor as they may from time to time deem necessary.

7. * * * The board of harbor commissioners shall have power to appoint annually all harbor-masters for the cities of Norfolk and Portsmouth, and assign their duties, and fix their compensation, * * * .

Regulations adopted by the Harbor Commissioners.

HARBOR-MASTERS.

Their jurisdiction is concurrent over the harbor of Norfolk and Portsmouth. They are vested with authority to designate the anchorage ground of all vessels, and are required to keep the channel-way and track of steamers clear. It is their duty to berth vessels at their appropriate wharves and docks; and when called upon by the proprietor or occupant of any wharf or dock to change the berth of any vessel lying at such occupant's premises, it is made their duty to move such vessel to some other wharf, or to a safe anchorage in the stream. They are charged with the execution of the police regulations which have been or may hereafter be adopted for the better government of the harbor, * * * * * .

The practice of boarding vessels below, or on their arrival in the harbor is deemed no longer necessary, and the harbor-masters are henceforth relieved of this duty; but they are required to see that the regulations forbidding vessels from anchoring in the channel-way, or in the track of steamers is strictly observed.

They shall be entitled to receive as compensation fees, as follows, viz:

Three dollars ($3) per month from each steamer (except those trading through the canals, ferry-boats, and tugs) that runs regularly to the port; and from all transient vessels arriving from or destined to any foreign port, as follows:

Schooners and brigs	$3 00
Barks	4 00
Ships	5 00
Steam-ships	5 00

They shall also be entitled to receive from all vessels in the coasting trade arriving here, whose length over all is 75 feet and upwards, a fee of $3, to be paid only once in a twelve-month. The harbor-masters are required to keep a register of all such coasting vessels for reference and for examination by the commissioners.

They are required to see that the regulations of the United States Government requiring fog-horns to be blown or ship's bells rung by all vessels anchored within the harbor during the prevalence of fog are strictly conformed to. * * * * * .

REGULATIONS REQUIRED TO BE OBSERVED IN THE HARBOR.

1. No vessel having gunpowder on board shall approach any wharf nearer than 200 yards. Such vessels shall anchor out of the way of passing steamers, and shall keep a red flag flying while receiving or discharging powder.

The handling of powder to and from vessels in the harbor must be under the supervision of a harbor-master, whose duty it is to see that every precaution against danger of ignition and explosion is adopted and rigidly observed.

2. All vessels at the end of wharves, or in docks, shall, when required, haul either way to accommodate vessels going in or coming out from such wharves or docks. They shall not occupy regular steamers' or sailing packets' berths without permission from the recognized occupants of such wharves and docks. And they are required to rig in all fore-and-aft spars, have boats hoisted up under the bow, and davits turned up, as the harbor-master may direct.

3. Vessels when not engaged in loading or discharging cargo shall give place to such vessels as are ready to receive or deliver freights. And if the captain or person in charge of any vessel refuse to move said vessel when notified by the occupant of the wharf at which she is lying, the harbor-master shall order him to haul to some other berth, or in the stream; and should the captain or person in charge refuse to obey the orders of the harbor-master, then the harbor-master shall himself move the vessel at the owner's expense, by use of steam-tug if necessary, and shall be entitled to a fee of $5, to be recovered from the owners of the offending vessel.

4. Vessels dropping out from wharves or docks preparatory to departure for sea, must anchor under the direction of a harbor-master, so as not to obstruct passing vessels in the channel-way.

5. All vessels, boats, and lighters over 10 tons burden shall have at all times a ship-keeper on board, and all such are required to move whenever ordered to do so by a harbor-master; and no vessel, boat, or lighter shall anchor or make fast to any wharf so as in any way to obstruct the passage of any regular ferry-boat.

6. Whenever the services of a harbor-master are required to move a vessel from the stream to any wharf, after being once berthed at her wharf, to land or receive cargo, or from any wharf to the stream, or from one wharf to another, the harbor-master when so employed shall be entitled to receive from the master or agent of such vessel for his services a fee not less than $2 nor more than $5, according to the size of the vessel, viz:

For a medium-size schooner	$2 00
For brigs and large schooners	3 00
For ships and barks	5 00

It is not intended to invest the harbor-master with any right or privilege to superintend in person the shifting of vessels from berth to berth. This section is designed only to provide for cases when harbor-masters are actually employed by masters or consignees, or when the authority of a harbor-master is invoked to move a vessel from berth to berth against the will of the master.

7. It shall not be lawful for any boat or vessel propelled in whole or in part by steam to enter the harbor at or above the Naval Hospital Light, or to depart from said harbor or any part of it at a greater speed than four miles per hour. And the master or commander of any such boat or vessel who shall enter or depart from said harbor within the above limits, at a greater speed than here prescribed, shall forfeit and pay the sum of $50 for each and every offense, * * * . And in addition such master or commander shall be liable for any damage done to any vessel or wharf by his steamer going at any greater rate of speed than is here prescribed.

This order, so far as relates to the speed of steamers, is not intended to apply to regular ferry steamers. * * * The harbor-master, will see that due notice of this section is served on the masters of all steamers.

8. The harbor-masters have full authority, and they are hereby required so to regulate the manner in which a vessel shall lie at any of the public wharves, that the facilities for discharging and receiving cargoes may be afforded as generally as may be practicable, and as will best promote the public interest. Any person having charge of any vessel, who shall refuse or neglect to obey the harbor-master in carrying out this section, shall forfeit and pay a fine of $5 for each and every offense.

9. No person in charge of any ship or vessel shall permit any fire to be kept on the deck thereof while lying at any wharf or dock within the harbor, between the hours of 10 o'clock at night and 5 o'clock in the morning, from the 1st of April to the 1st of October; and between the hours of 9 o'clock at night and 6 o'clock in the morning from 1st October to 1st April. Any one offending against this section shall forfeit and pay a fine of $20 for each and every offense.

10. Stone, coal, ballast, sand, manure, oyster-shells, ashes, or dirt of any kind whatsoever, shall not be taken on board any vessel lying at a public or private wharf, under a penalty of $20, unless the master of such vessel first obtain the written permission of a harbor-master. And the harbor-masters are required, before granting permission as aforesaid, to see that the master of such vessel has taken all necessary precautions to prevent injury to the navigation of the harbor by any such articles falling therein.

11. If any person shall cast or throw any ballast, dirt, oyster-shells, filth, or trash into the water in any part of the harbor of Norfolk and Portsmouth, or on the shores of said harbor below high-water mark, unless for the purpose of making a wharf, after permission obtained for the purpose, and which wharf shall be sufficiently inclosed and secured so as to prevent injury to navigation, such person so

offending shall forfeit and pay for every offense not less than $20 nor more than $50. * * * [The term "Harbor of Norfolk and Portsmouth" in this section, as well as in all other sections where it occurs, is meant to include the jurisdiction of the commissioners, viz: five miles above and five miles below the limits of the two cities.]

12. If any vessel shall be lying in any dock in Norfolk or Portsmouth, or at the entrance thereof, so as to obstruct any vessel that shall be coming into the same, or moving from one place to another therein, or going out of the same, the vessel so obstructing, unless actually engaged in loading or unloading, and then, if deemed expedient by the harbor-master, shall be removed to such place as shall be necessary to give room to the passing vessel, under a penalty at the rate of $5 per hour for the delay which shall be occasioned to the passing vessel, unless in cases where some unavoidable casualty or accident may make it impracticable to remove such obstructing vessel.

13. It shall be the duty of the captain or other person having in charge any vessel lying at any of the public wharves or docks, to top the yards, rig in the jib-booms, and place the anchor or anchors on the deck of such vessel whenever required so to do by the harbor-master, or the occupant of any wharf or his agent; and any person having charge of any vessel who shall neglect or refuse to obey the directions aforesaid, shall forfeit and pay a fine of $5 for each and every offense.

14. No ballast of any kind, or coal, shall be landed on any wharf or dock in the harbor, except by permission and under the supervision of the harbor-masters, who are directed to see that every precaution is observed to prevent its falling into the water. And for such supervision the supervising harbor-master shall be entitled to receive from all such vessels, $1 per day for each day or part of a day they are engaged in landing ballast. Any one offending against this section shall forfeit and pay a fine of not less than $5 nor more than $20. No fee shall be charged for supervising the landing of coal, but offenders shall be liable to the fine.

15. No pitch or tar, or other inflammable matter shall be heated on board any vessel lying at any wharf or dock in the harbor. But the same may be done on a floating stage or lighter. Penalty $5 for every offense.

16. Vessels coming to anchor ~~at~~ any point above Hospital Light, must anchor on or as near the flats as possible, so that the channel-way will not be obstructed; and if to remain over forty-eight (48) hours, they must be moored with both anchors, so as not to swing within 100 yards of any wharf.

17. All vessels coming to anchor below the Naval Anchorage buoy abreast the Hospital Light, shall anchor in a direct line with said buoy, and shall be moored so as to keep the channel-way to the southward well open for vessels bound in or out.

18. Vessels whose draught of water will admit of loading on the flats, out of the way of passing steamers, will be permitted so to load, but no vessel whose draught of water, when loaded, is over eight feet, will be allowed to load in the stream, except in cases of emergency, and then only by special permission from the harbor commissioners.

19. Shooting from the deck of any vessel or boat within the harbor is positively prohibited. Any violation of this order will subject the party so offending to a fine of $5.

20. Steamers of all classes are expected to use coal as fuel for their engines; but should any steamer plying this harbor use wood as fuel, "spark catchers," or some other effectual spark extinguisher must be attached to the smoke stacks of all such steamers so as to prevent the escape of burning flakes. A non-observance of this section will subject the offending steamer and owners to a fine of $20 for each and every offense, and to full damages for any loss that may be sustained by fire traceable to any such steamer using wood for fuel.

21. The dumping of ashes from steamers into the waters of the harbor is strictly forbidden, under a penalty of not less than $20 nor more than $50 for each and every offense. * * *

23. Piles, *painted red*, have been driven along certain sections of the unimproved water front of the harbor to make the established port warden lines. Similarly painted piles will be driven in all the unimproved sections so soon as port warden and limiting lines are decided upon for those sections. Masters of all classes of craft, and all other persons are forbidden from making fast to these piles, or to disturb them in any way, under a penalty of $6 for every offense.

It is ordered, that in all cases where a penalty is not affixed for a violation of any section of the Harbor Regulations, the penalty in each case shall be not less than $5 nor more than $20.

QUARANTINE.

Extracts from Virginia Code, 1887.

Sec. 1734. *Cities and towns may establish quarantine grounds.*—The council of any city or town may establish a quarantine ground for such city or town, and the councils of any two or more cities or towns may establish a quarantine ground for their common use, * * * .

Sec. 1735. *Quarantine regulations for vessels.*—The council of any city or town may from time to time prescribe the quarantine to be performed by all vessels arriving within the harbor or vicinity of such city or town, and regulations therefor, not contrary to law.

Sec. 1736. *To whom and what quarantine regulations extend; penalty for violation.*—Such regula-

tions may extend to all persons, goods, and effects arriving in such vessels, and to all persons who go on board of the same. If any person violate such regulations, * * * he shall be fined not less than five nor more than five hundred dollars.

Sec. 1377. Vessel and cargo, if infected, to be put in quarantine.—The health officer in such city or town may cause any vessel arriving in its port or vicinity, if the vessel or its cargo be, in his opinion, so foul or infected as to endanger the public health, to be removed to the quarantine ground, * * *.

Sec. 1378. Penalty on master of vessel, etc., refusing to answer inquiries.—If any master, seaman, or passengers * * * refuse to answer on oath such inquries as may be made by any health officer or other authorized person, relating to such infection or disease, he shall forfeit not less than one hundred nor more than five hundred dollars.

Sec. 1379. Masters to deliver bill of health, etc.—The master of a vessel ordered to perform quarantine shall deliver to the officer appointed to see it performed, his bills of health and manifests, and his log book and journal. If he fail to do so, or repair in proper time after notice, to the quarantine ground, or depart thence without authority to do so, he shall be fined not exceeding five hundred dollars. * * *.

MARYLAND.

Extracts from the 39th Article of the Maryland Code.

PILOTS.

12. It shall not be lawful for any person to act as pilot, notwithstanding his having obtained a warrant as aforesaid, unless he or the company to which he belongs shall keep one sufficient boat of at least twenty-six feet keel, straight rabbet and decked, and well found, under the penalty of one hundred and fifty dollars for every vessel such person shall undertake to conduct or pilot.

13. No pilot shall make any demand to pilot any vessel, unless he shall have a branch or license to the destined port of said vessel; and the name of every boat and the place she belongs to shall be put on her stern and on her mainsail and foresail in large letters.

15. The board of examiners may make such rules and orders for the government and regulation of pilots licensed by them as they may think proper, not contrary to the provisions of this article; and they may, by their order, deprive any pilot of his license, or suspend him for a limited time, for breaking such rules or orders, or omitting anything required by the same, or for acting in any manner contrary thereto. And if any pilot so suspended or deprived shall, during the time of suspension or deprivation, take upon himself to conduct or pilot any vessel, he shall forfeit and pay one hundred and fifty dollars for each offense.

16. All masters of foreign vessels and vessels from a foreign port, and all vessels sailing under register, bound to and from Baltimore city, except vessels engaged exclusively in the coasting trade, shall take a licensed pilot, or in case of refusal to take such pilot, shall himself, owners, or consignees, pay the said pilotage as if one had been employed; and such pilotage shall be paid to the pilot first speaking or offering his services as pilot to such vessel before Cape Henry bears south, if inward bound.

17. The master or owner of every vessel sailing under a coasting license over one hundred tons shall, before going to sea, apply to the board of pilots for a license to navigate the Chesapeake Bay without a pilot, and shall pay to the said board of pilots for such license at the rate of six cents per ton; and such license shall be good for twelve months from the date thereof.

18. The master or owner of every vessel required to take out license under the last two preceding sections, navigating the Chesapeake Bay without such license, shall either take the first licensed pilot who offers to conduct or pilot his vessel to or from sea, or shall pay him full pilotage; but the payment of full pilotage shall not be exacted from any inward bound vessel which, on her arrival and before her departure, shall obtain from the board of pilots a license in pursuance of the provisions of this article.

20. The master or owner of any vessel bound up or down the Pocomoke River, or any river whose mouth is bounded on both sides by the eastern shore of Maryland, shall not be required to take out any license from the board of pilots, or to pay any pilotage to or from any of said rivers, unless a pilot be employed; provided the master or owner of any vessel shall not touch in any of said rivers on their passage to or from Baltimore for the purpose of avoiding any of the provisions of this article.

21. No pilot shall charge or receive any greater or less reward for compensation for his services as such, than as follows: for every vessel inward bound to Baltimore or from Baltimore to sea, drawing fifteen feet water or over, five dollars for each foot of water she may draw; for every vessel drawing twelve feet water and not exceeding fifteen feet, four dollars for each foot she may draw; for all vessels drawing less than twelve feet water, three dollars and fifty cents for each foot she may draw, which rates shall apply to vessels to or from Georgetown.

22. Any vessel having a license under the provisions of this article, which may require a pilot, shall have the services of one at a deduction of 20 per cent. on the pilot rates hereby established, on one inward passage to Baltimore during the existence of said license; and if any vessel bound to sea

shall go to Hampton Roads for any other cause than distress of weather, having a Maryland pilot on board, the master or owner shall pay to said pilot twelve dollars for conducting her in, and ten dollars for taking her out.

25. If any master of any vessel shall carry any licensed pilot to sea against his inclination, he shall pay the said pilot, if said vessel be of over twelve feet draught, one hundred dollars per month, until said pilot's return or death; if said vessel be of over nine feet and not over twelve feet draught, eighty dollars a month, until said pilot's return or death; if said vessel be of nine feet draught or under, sixty-six dollars and sixty-six and two-thirds cents per month, until such pilot's return or death; and for every day's detention at quarantine, by order of the health officers, three dollars per day for every day of such detention.

27. Any pilot being detained on board any vessel, unless such detention be unavoidable, shall be allowed three dollars per day for each day he may be so detained, to be paid by the master, agent, owner, or consignee of said vessel.

28. Whenever a pilot is engaged to pilot a vessel, the master shall continue him (if inward bound) to her first port of discharge or to sea (if outward bound), or pay him full pilotage.

29. The pilots shall be required, under the direction of the board, to keep as many as three pilot-boats at sea, one of said boats to be stationed fifteen miles to the north of Cape Henry, one in the latitude of and ten miles from Cape Henry, and one fifteen miles south of Cape Henry; and the board shall have full power to make rules and regulations for their cruising, and may designate and appoint five pilots and grant them authority to enforce such rules and regulations as they may adopt, and to inspect the boats in service from time to time, and generally do all things which may be necessary for the efficiency of the pilots and the boats used in the service.

30. Nothing contained in this article shall be construed to prevent the employment of any person to pilot a vessel in any of the rivers of this State, except the Patapsco and Potomac rivers, or from any part of the Chesapeake Bay north of the Patapsco River, to any other part of said bay north of said river.

HARBOR REGULATIONS, PORT OF BALTIMORE.

Extracts from Baltimore City Code, 1879, and Supplement to the Baltimore City Code, 1885.

Ordinances No. 61, of May 30, 1879, No. 58, of April 20, 1880, and No. 70, of May 17, 1881, enact as follows:

18 A. The harbor board are hereby authorized and directed to cause the areas hereinafter described, and to be known as anchorage grounds Nos. 1, 2, 3, and 4, to be marked by buoys or otherwise, and all vessels anchoring in the harbor and port of Baltimore shall be required to anchor so as to keep within the limits of the anchorage grounds so designated, and be subject to all the rules, regulations, and restrictions hereinafter mentioned.

18 B. Anchorage ground No. 1 shall be within the following described lines, viz: south and west of a line drawn from the northeast corner of the bulkhead at Clark's ship-yard to the northeast corner of the pier at Beacham & Company's ship-yard.

18 C. Anchorage ground No. 1 shall be used only for the anchorage of bay crafts, and no vessel shall be permitted to anchor or lay within three hundred feet of any pier or bulkhead fronting said anchorage ground; any vessel or vessels anchored in these prescribed lines so as to obstruct any steamboat, sailing-vessel, or craft from free ingress or egress to or from any wharf or dock, shall remove to such place as the harbor-master may direct, after having received a half-hour's notice from him; and in the event of there being no person on board or in charge of such vessel or vessels lying at anchor in violation of this section, upon whom the harbor-master can serve such notice, then it shall be the duty of the harbor-master, and he is hereby authorized and empowered, to cause said vessel or vessels to be removed, the expense of said removal to be borne by the owner or owners thereof, said expense to be recoverable as fines and penalties are now recoverable; any person in charge of any vessel who shall violate the provisions of this section shall forfeit and pay a penalty of five dollars, and a further penalty of five dollars per hour for every hour that such violation shall be continued.

18 D. Anchorage ground No. 2 shall be within the following described lines, viz: a line drawn from the southeast corner of Waters' wharf (Fell's Point) toward the Lazaretto Light-house until it intersects a line drawn from the northeast corner of the Baltimore and Ohio Railroad pier, No. 8, toward the southwest corner of the bulkhead at the Atlantic (or Canton Company's) wharves now used by Malster & Rainey as a ship-yard, and thence northeasterly along said last described line.

18 E. Anchorage ground No. 2 shall be used only for the anchorage of bay crafts and coastwise vessels; any vessel anchored inside of these prescribed lines shall be subject to the same rules and regulations, and the same fines and penalties, as are applicable to anchorage ground No. 1.

18 F. Anchorage ground No. 3 shall be within the following described lines, viz: a line drawn from the foot of Fell street toward the southwest corner of the bulkhead at the Chesapeake Iron Works (Canton) until it intersects a line drawn from the northeast corner of the wharf at Fort McHenry toward the Northern Central Railway Company's elevator (Canton); thence eastwardly

along said last described line to a point five hundred feet west of the pier-head line, as laid down on the plat accompanying this ordinance; thence northwardly, parallel to and five hundred feet west of said line, until it intersects a line drawn from the southwest corner of Bollman's coal-oil pier toward the northeast corner of the Baltimore and Ohio Railroad Company's Elevator A; thence southwestwardly along said last described line drawn from the foot of Fell street to the bulkhead at the Chesapeake Iron Company's wharf.

18 G. Anchorage ground No. 3 shall be used only for the anchorage of inward-bound vessels, excepting, however, bay crafts and coastwise vessels; no vessel shall be permitted to lay at anchor within the prescribed lines for a longer period than twenty-four hours from the time of her arrival; any person in charge of any vessel who shall violate the provisions of this section, after having received one hour's notice from the harbor-master to remove, shall forfeit and pay a penalty of twenty-five dollars, and a further penalty of five dollars per hour for every hour such violation shall be continued.

18 H. Anchorage ground No. 4 shall be within the following described limits, viz: southwestward of a line drawn from the flagstaff at Fort McHenry to the outer or eastern end of the highland of Hawkins' Point, and south of the range of the buoys marking the dredged channel leading to Winans' wharves, in the southwestern branch of the Patapsco, between Fort McHenry and Light street bridge.

18 J. Any vessel anchored in these prescribed lines so as to obstruct any steamboat, sailing-vessel, or craft from free ingress or egress to or from any wharf or dock, shall remove to such place as the harbor-master may direct, after having received one hour's notice from him; any person in charge of any vessel who shall violate the provisions of this section shall forfeit and pay a penalty of five dollars, and a further penalty of five dollars per hour for every hour such violation shall be continued.

18 K. It shall be the duty of the harbor-master to notify any person in charge of any vessel which shall anchor or lay outside of the lines described in the preceding sections to remove such vessel within the said lines; and the person in charge of such vessel shall be required to so remove the same within half an hour after the service of such notice; any person in charge of any vessel who shall violate the provisions of this section shall forfeit and pay a penalty of twenty-five dollars, and a further penalty of ten dollars per hour for every hour such violation shall be continued.

18 L. All vessels, when at anchor or lying within the anchorage grounds described in the foregoing sections, shall, between sunset and sunrise, exhibit, where it can best be seen, but at a height not exceeding twenty feet above the hull, a white light, under a penalty of twenty-five dollars.

18 O. The comptroller of the city is hereby authorized and directed (to buy or have constructed and keep in repair a good and substantial yawl-boat, and) to have a sufficient number of copies of this ordinance printed, which printed ordinance shall be certified to by the comptroller, and the seal of the city attached, and shall be furnished by the comptroller to the harbor-master; and the said harbor-master shall serve a copy of the said ordinance, without plat, on all vessels (excepting, however, bay crafts and vessels under one hundred tons burden) hereafter arriving at the port of Baltimore; and the persons in charge of said vessels upon whom the same shall be served shall pay therefor to the said harbor-master the sum of fifty cents; *provided, however*, that if the person in charge of any vessel shall have a duly certified copy of this ordinance on board and shall exhibit the same to the harbor-master he shall be exempt from the provisions of this section; any master or consignee of any vessel who shall refuse to pay the said harbor-master for a copy of this ordinance shall forfeit and pay a fine of one dollar.

18 P. Fines and penalties imposed by this ordinance shall be recovered as other fines and penalties are now recoverable.

Extracts from Baltimore City Code, 1879.

ARTICLE XXII.—STATUTES.

2. No person, his servant, or agent shall put or throw into the Patapsco River, or any of the navigable branches thereof, any earth, sand, or dirt, or lay out on the beach or shore of said river, below common high-water mark, any earth, sand, or dirt, unless such earth, sand, or dirt be first well secured by stone walls, dovetailed log pens, or otherwise, so that no part thereof may wash into said river or the navigable branches thereof.

3. Any person offending against the provisions of the last preceding section shall forfeit and pay the sum of fifteen dollars, to be recovered before a justice of the peace, * * * one-half to the State and the other half to the person who shall sue for the same.

WHARFINGER AND WHARVES.

22. The Governor, by and with the consent of the Senate, shall biennially appoint one or more persons of integrity as wharfingers in the city of Baltimore.

25. It shall be the duty of the State wharfinger so appointed to take charge of the wharves which he may be directed and authorized to take charge of belonging to or rented by the State within said city, and to charge and collect from all vessels and persons resorting to or using any of said wharves

that he may have charge of the rates of wharfage as are now authorized by any law or ordinance within said city, or may hereafter be established by the mayor and city council of Baltimore.

Extracts from Baltimore City Code, 1879.

ARTICLE XXII.—ORDINANCES.

26. A tonnage duty of two cents per ton shall be and is hereby assessed and levied upon every vessel of sixty or more tons arriving at the port of Baltimore; *provided, nevertheless,* that the sum of money assessed and levied by this section shall be collected from each vessel but once a month, although she may arrive more frequently, and the harbor-masters are hereby authorized to collect the same.

27. It shall be the duty of the captain or commander of any vessel arriving at the port of Baltimore, and subject to the payment of tonnage duties, to exhibit to the harbor-master, at his request, the enrollment or license of said vessel, in order to ascertain the proper tonnage thereof; and if the captain or commander of such vessel shall refuse to comply with the request of the harbor-master such captain or commander shall forfeit and pay the sum of twenty dollars, and the like sum of twenty dollars for every time such vessel may arrive at the port of Baltimore, until the request of the harbor-master is complied with.

33. It shall be the duty of the person having in charge any vessel lying at any of the public wharves or docks to top the yards, rig in the jib-booms, and place the anchor or anchors on the deck of said vessel, whenever required so to do by the harbor-master or the occupier of any wharf or his agent; and any person having charge of any vessel who shall neglect or refuse to obey directions as aforesaid shall forfeit and pay a fine of five dollars for each and every offense.

36. No person in charge of any ship or vessel shall permit any fire to be kept on the deck thereof while lying at any wharf or dock within the city, between the hours of ten o'clock at night and five o'clock in the morning from the first day of April to the first day of October, and between the hours of nine o'clock at night and six o'clock in the morning from the first day of October to the first day of April; and it shall be the duty of the police officers to visit the bay craft within their respective districts and give information of this regulation to some person on board.

37. No person shall remain at anchor for a longer period than one hour in that part of the harbor lying northwest of a line drawn from the terminus of Hull street, at the port warden's line on Locust Point, to the building on the end of Hughes street formerly occupied as a turpentine distillery; and the person in charge of any vessel so remaining at anchor shall forfeit and pay two dollars for every hour such vessel may so remain.

38. It shall not be lawful for any vessel drawing more than eight feet water to enter any of the public docks of the city of Baltimore without first obtaining permission from the harbor-master, whose duty it shall be to provide a suitable berth for such vessel; and any master or skipper of such vessel entering any of the aforesaid docks without such permission shall forfeit and pay, for every such offense, ten dollars, and one dollar for each and every hour he shall obstruct the free passage of said dock thereafter. And it shall be the duty of the harbor-master to keep a free passage in such docks for vessels and scows moving in and out of the same.

48. No ballast shall be landed from any vessel between the months of May and October without permission therefor first obtained from the harbor-master, under a penalty of twenty dollars.

50. It shall not be lawful for any owner, captain, mate, or any other person, to throw overboard into the harbor, from any ship, bark, brig, schooner, sloop, pungy, steamboat, barge, or canal-boat, above the Lazaretto, any ashes, shells, coal, decayed fruit, dead fish, or such garbage as accumulates on any of the above enumerated vessels, or any other kind of filth; and if any person or persons shall violate the provisions of this section he or they shall, after conviction before a justice of the peace, forfeit and pay a fine of twenty-five dollars.

QUARANTINE LAWS, PORT OF BALTIMORE.

Extracts from Baltimore City Code.

ARTICLE XXIII.—ORDINANCES.

Resolution No. 202, of May 17, 1881, declares as follows:

131. The name of the Marine Hospital is hereby changed to the "Quarantine Hospital of the port of Baltimore."

132. All vessels arriving from sea between the thirtieth day of April and the first day of November, and at such other times as the mayor and board of health may direct, shall not approach nearer to the city than the quarantine ground, which shall be upon the southern or main branch of the Patapsco River; and it shall not be lawful for any vessel that is subject to quarantine regulations to approach nearer to the city than a line drawn from the point of Fort McHenry to the hospital ground; nor shall any such vessel come within the Lazaretto light, upon the north side of Fort McHenry, until she has received a written permit from the marine hospital physician, or his assistant, to that effect; and said marine hospital physician or assistant shall board all vessels arriving from sea (except vessels returning in distress, with outward cargo on board), after their arrival at quarantine ground, as soon as

practicable; and such ship or other vessel shall come to anchor whenever required by the marine hospital physician or his assistant, from the thirtieth day of April to the first day of November in each and every year; and it shall be the duty of the said physician or his assistant carefully to examine into the health of all the officers, crew, and passengers of such vessels, the condition of the cargo, the state of the vessel as to cleanliness, and generally into all such circumstances as may in any way affect or concern the health of the city; and if he shall believe it to be unsafe to permit any vessel so examined to unlade her cargo or come to the wharf he shall order said vessel to the Lazaretto wharf, or to some other place outside the city limits, there to perform the necessary purification, which shall be done in such manner as may be directed by said physician or assistant, to his entire satisfaction; or whenever the health of the city, in the opinion of the physician or his assistant, may be endangered, whether from the actual presence of disease or from an unclean condition of the ship, vessel, or passengers, to require such ship or vessel to come to anchor at the quarantine ground, and there remain until the passengers have been removed and the ship or vessel thoroughly cleaned and purified; and all expenses of purification and removal, and all other expenses incurred by said physician or his assistant, to prevent the introduction or propagation of contagious and infectious diseases, to be paid by the master, owner, or consignee of the ship or vessel for which the expense was incurred. And it shall not be lawful for any person commanding or having charge of such vessel to remove her from the place assigned or designated by the said physician or his assistant without his written permission, or to suffer such vessel to be so removed by others; and any ship, vessel, or person violating any of the provisions of this section, or neglecting to comply with any orders issued or given by said physician or his assistant, in conformity thereto, shall be liable to a penalty of five hundred dollars, and a further penalty of fifty dollars for every hour the ship or vessel may remain in any position in violation hereof; and an action for the recovery of all fines, forfeitures, or expenses incurred in carrying into effect any of the provisions of this ordinance, may be laid against the ship or vessel, the master, the owner, or consignee of the ship or vessel so violating each or all of them, at the election of the city.

134. All vessels, after their cargoes are discharged, shall, if deemed necessary by the board of health, be forthwith removed to the stream, and to a proper distance from the wharf, and thoroughly cleansed and ventilated under the direction of the said board; and any person offending against the provisions of this section, or who shall refuse or neglect to comply with the order of the officer or officers charged with its execution, shall forfeit and pay the sum of one hundred dollars, and twenty dollars for every hour thereafter during which said disobedience shall continue.

135. The commander, captain, pilot, or person having charge of any vessel coming to the port of Baltimore, from sea or elsewhere, and on board of which there shall be any person or persons affected with small-pox, varioloid disease, or other eruptive complaint, or infectious or contagious diseases, or whose condition would authorize a suspicion that the malady may be small-pox or any modification thereof, or any other infectious or contagious diseases, or on board of which small-pox, varioloid, or any eruptive disease of a kind which would authorize a suspicion that it had been any form or modification of small-pox, or any other infectious or contagious diseases, shall have appeared at any time during the voyage from the port or place at which the vessel had cleared, shall bring the said vessel to at the quarantine ground, and there await the arrival of the marine hospital physician or his assistant, and not depart thence until a written permission from the marine hospital physician or his assistant shall be obtained for that purpose; and it shall not be lawful for the said commander, captain, pilot, or other person having charge of such vessel, to land or bring on shore, or suffer to be landed or brought on shore, any passenger or passengers, or any of the officers or crew of such vessel, or any part or parcel of the baggage, goods, or effects, or any other articles contained in said vessel, until he has obtained a written permission from the marine hospital physician or his assistant so to do; and it shall, moreover, be the duty of the persons aforesaid having charge of said ship or vessel to make a full disclosure of all such circumstances in relation to the health of the officers, crew, and passengers on board said vessel during the voyage and at the time of the inquiry, as may be necessary to enable the marine hospital physician or his assistant to determine on the measures necessary to be taken in the premises, and particularly to answer any interrogations which may be put to him by said officer in reference to the existence of small-pox, varioloid, or other eruptive, infectious, or contagious diseases among the officers, crew, or passengers on board the vessel at the time of the inquiry, or at any previous time during the passage; and any person neglecting or refusing to comply with any of the requisitions or provisions contained in this section, or with any order of the marine hospital physician or his assistant, in pursuance of and in conformity thereto, shall forfeit and pay the sum of five hundred dollars, and if the said penalty shall have been incurred by the commander, captain, pilot, or other person having charge of such vessel, and he shall abscond or evade the execution of this ordinance, then the said penalty shall be paid by the owner or consignee of such ship or vessel, unless he shall give such information as may lead to the apprehension of the delinquent.

136. The mayor and board of health may, in their discretion, exempt from the quarantine regulations of the city of Baltimore all steam vessels coming into the port of Baltimore from any port in the United States north of Cape Henry, which exemption shall be certified to the physicians at the Marine Hospital, and shall remain in force until countermanded by said mayor and board of health,

and no longer; *provided, however*, that no exemption granted under the provisions of this section shall be so construed as to exempt the commander, captain, pilot, or other person having charge of any vessel coming into the port of Baltimore, or the owners or consignees of the same, from the penalties and fines imposed by section 135 of this article.

139. Vessels arriving from ports north of Cape Henry, free from epidemic or contagious disease, and with cargoes from said ports, shall not be subject to the usual quarantine regulations contained in section 133 of this article, unless, in the judgment of the board of health, compliance with said regulations shall be necessary to protect the health of the city.

140. The marine hospital physician or his assistant shall visit all ships or vessels that may come to at the quarantine grounds, as directed in section 135, as soon as practicable, in daylight, after the knowledge of such fact shall have been by any means obtained by him; and said officers are hereby authorized and directed to send all persons affected with the small-pox, varioloid, or other infectious or contagious diseases who may be found on board such vessels, to the Marine Hospital; to take or direct such measures in regard to the officers, crew, and passengers as in their opinion may be necessary to disinfect them, and to prevent their propagating the disease; to direct all such articles on board the vessels to be landed, in order to be purified from infection, as they may deem proper, and to subject all such articles to such process of disinfection as they may think necessary for that purpose. And the marine hospital physician is, moreover, authorized and required to keep all such articles as he may deem necessary to subject to the disinfecting process aforesaid, under his own care and supervision, until such purpose be accomplished. And it shall be the duty of the marine hospital physician or his assistant, with the approbation of the mayor, to adopt all means or measures consistent with the laws of the United States, the State of Maryland, and of the city of Baltimore, to prevent any communication between the citizens of Baltimore and those detained, until the necessary means are used to disinfect them, their baggage, and other property to the satisfaction of the marine hospital physician or his assistant. And any person removing or attempting to remove any baggage or merchandise, detained in virtue of this section or any of the health ordinances of the city, shall forfeit and pay twenty dollars and all expenses of removing said baggage or merchandise back to the hospital or Lazaretto grounds, as may be directed, and of delivering the same into the charge of the marine hospital physician or his assistant.

141. The expenses which may be incurred in the disinfecting and purifying of vessels, persons, baggage, or other articles from the infection of small-pox or other diseases, as provided for in the preceding section, shall be done at the proper cost and charge of the commander, captain, owner, or consignee of the infected vessel; and such part thereof as it may be necessary for the marine hospital physician or his assistant to incur in the first instance shall be charged to the commander, captain, owner, and consignee, or either of them, at the discretion of the marine hospital physician or his assistant, and collected by him; but if it cannot be so collected the amount which said physician shall have necessarily expended for the purpose aforesaid shall be refunded or repaid by the register of the city, with the approbation of the mayor.

144. The marine hospital physician or his assistant, upon visiting any vessel in compliance with the provisions of this ordinance, whether at quarantine or elsewhere, shall demand and receive from the commander, captain, owner, or consignee of such vessel the following sums of money, viz: From any vessel not exceeding two hundred tons, register measurement, two dollars for each and every voyage; and for vessels over and above two hundred tons one cent a ton for each and every voyage. * * *. And if any commander, captain, owner, or consignee of such vessel shall refuse or neglect to pay the sum authorized to be demanded of him by this ordinance it shall be the duty of the marine hospital physician or his assistant to issue and deliver, or cause to be delivered, to said commander, captain, owner, or consignee a written order, forbidding the landing of any part of the cargo of such vessel until the demand is paid; and if any person so notified shall disobey such order he or she shall forfeit and pay the sum of twenty dollars, and the further sum of twenty dollars for every hour thereafter during which such disobedience shall continue.

150. It shall be the duty of the marine hospital physician or his assistant to carefully inspect the condition of all passengers and passenger ships or vessels arriving at this port from any foreign country; and whenever, in their opinion, the health of the city may be endangered, whether from the actual presence of disease or from an unclean condition of the ship or passengers, to require such ship or vessel to come to anchor at the quarantine ground, and there remain until all the passengers have been removed and the ship or vessel thoroughly cleansed and purified; all expenses of purification and removal, and all other expenses incurred by the marine hospital physician or his assistant to prevent the introduction or propagation of contagious or infectious diseases, to be paid by the master, owner, or consignee of the ship or vessel for which the expense was incurred.

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APPENDIX II.

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:

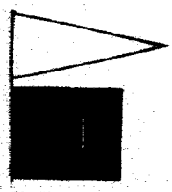
1st. *A Cautionary signal*, a yellow flag with a white center, which indicates that the winds expected are not so severe but well-found and seaworthy vessels can meet them without great danger.

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.

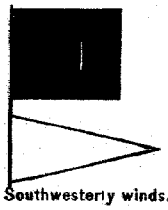
In order to afford the public as exact information as possible regarding the relative position of the storm and the winds expected, two pennants are used. The red pennant indicates that the winds are to be easterly, that is, from northeast to *south*, inclusive, and that the storm-center is approaching. 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.

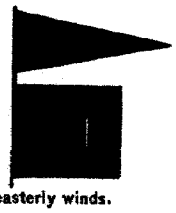
STORM SIGNALS.



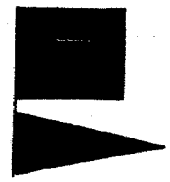
Northwesterly winds.



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.

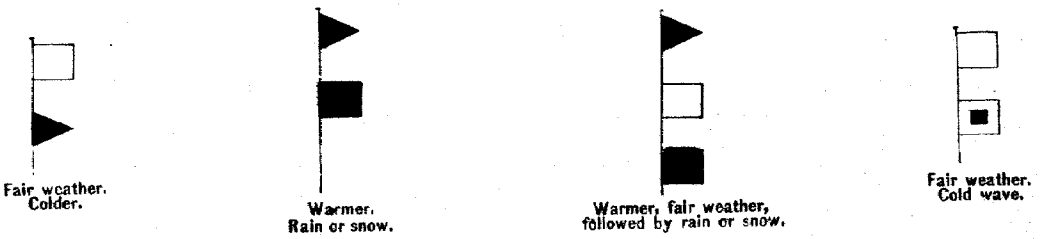
WEATHER, TEMPERATURE, AND COLD-WAVE SIGNALS.

[Adopted by the Signal Service for general use 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 seven 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 III.

REGULATIONS U. S. MARINE-HOSPITAL SERVICE.†

APPROVED APRIL 24, 1885.

(EXTRACTS.)

GENERAL DUTIES OF MEDICAL OFFICERS.

76. The duties of officers of the medical corps are professional, sanitary, and executive. General duties.

77. 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.

80. 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, * * * * *. 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. To examine applicants for relief, and certain other persons as to physical qualifications for enlistment in Government service.

81. 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.

82. 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.

83. 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 color-blindness and general visual capacity, and will give a certificate accordingly. Color-blindness and visual tests.

SANITARY DUTIES.

87. Upon the outbreak of epidemic small-pox 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.

125. 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.

126. 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.

127. The relief stations of the Marine-Hospital Service are grouped into eight districts, as follows: The District of the North Atlantic, the District of the Middle Atlantic, the District of the South Atlantic, the District of the Gulf, the District of the Ohio, the District of the Mississippi, the District of the Great Lakes, and the District of the Pacific.

South Atlantic.†

130. The District of the South Atlantic embraces the following-named relief stations, viz: Alexandria, Va.; Baltimore, Md.; Brunswick, Ga.; Charleston, S. C.; Crisfield, Md.; Darien, Ga.; Edenton, N. C.; Elizabeth City, N. C.; Fernandina, Fla.; Fredericksburg, Va.; Georgetown, D. C.; Georgetown, S. C.; Jacksonville, Fla.; New Berne, N. C.; Norfolk, Va.; Richmond, Va.; Rome, Ga.; Savannah, Ga.; Tappahannock, Va.; and Wilmington, N. C.; together with all other relief stations situated in the same customs districts.

Offices and dispensaries.

139. 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.

141. 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, or in th 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.

142. Seamen taken from wrecked vessels of the United States, 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.

143. 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.

Officers authorized to examine applicants.

144. At relief stations of the first class, the medical officer of the Service in charge, and at relief stations of the second or third class, the proper customs officer, * * * * * will receive the applications of persons claiming the benefits of the marine-hospital fund for care and treatment while sick or disabled.

Seamen must make application for relief.

145. 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.

146. 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.

147. 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.

148. 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.

149. 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.

Seamen to sign certificate.

150. 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.

Treasury Department Circular 20, June 20, 1890.

151. 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. Requirements as to service.

152. When an interval has occurred in the applicant's seafaring service by reason of the closure of navigation, it shall not be considered as excluding him from relief, except the sickness or injury for which he applies for relief be the 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 for any other employment, nor as excluding a seaman who may have been not more than three months away from his vessel, provided it be satisfactorily shown that such absence was due to sickness. Exceptions.

153. 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.

154. 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.

155. 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.

156. 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.

160. In every case where a doubt exists, whether the applicant is entitled to relief under the regulations, the application, accompanied by a statement of the facts, must be immediately referred to the Supervising Surgeon-General for decision; and, when the seaman is in such condition that immediate medical or surgical attendance is necessary, he will be placed under treatment pending the decision, and the action in the case taken by the officer reporting it will be stated in the letter. Certain cases to be submitted to Surgeon-General for decision.

162. 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.

163. 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.

164. 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, whose care and treatment was unauthorized by this Department. Money not to be paid to seamen for expenses of sickness.

165. 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.

166. 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.

167. 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.

171. 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 166, 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.

Temporary arrangements to be made.

172. 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 immediately 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.

Foreign seamen *et al.* not treated.

175. 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.

178. 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.

179. 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.

180. The bed-ticket, * * * * * unless presented on the day it is issued, * * * * * will be forfeited.

STATIONS OF THE SECOND CLASS.

Relief to be furnished on recommendation of physician.

188. Hospital relief will not be furnished at the expense of the marine-hospital fund, except upon the certificate and recommendation of an acting assistant surgeon or of a competent and reputable physician, showing that the applicant requires medical treatment.

Permits for hospital relief. Form 1916.

191. 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.

193. 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.

194. 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.

196. 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.

197. 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.

204. Hospital relief at stations of the third class will not be furnished except in cases of emergency and for a temporary period.

INSANE SEAMEN.

Relief for insane seamen. March 3, 1875, s. 5.

209. 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.

210. 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. * * * * *

213. 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. Burial expenses.

FOREIGN SEAMEN AND EMPLOYÉS OF GOVERNMENT SERVICES.

214. 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, * * * * *. Foreign seamen may be treated.

215. Seamen employed on vessels of the Navy, vessels of the Coast Survey, Light-House Service, Engineer Corps of the Army, and Mississippi River Commission may be admitted for care and treatment as patients of the Marine-Hospital Service only upon the written request of their respective commanding officers, * * * * *. Seamen of various Government services may be admitted.

219. 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.

301. 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.

302. 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.

303. 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.

304. 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.

306. 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.

GOVERNMENT OF NATIONAL QUARANTINES.

322. At ports where quarantine may be established by the Secretary of the Treasury, every vessel, before being permitted to enter, shall present to the collector of customs satisfactory evidence either that said vessel had not, at any time during a period of thirty days immediately preceding its arrival, touched at or communicated with any foreign port where cholera, yellow fever, or small-pox was known to exist in an epidemic form; that there had not been at any time during that period any case of contagious disease on board; and that said vessel does not convey any person or persons, merchandise, or animals afflicted with any infectious or contagious disease, Vessels required to present evidence of being free from contagious diseases before entry. Section 5, Act April 29, 1878, R. S., s. 4792.

or that the said vessel has been thoroughly cleaned and disinfected by the quarantine officer, and is free from infection at the time of entry. The certificate to that effect, of the medical officer of the Marine-Hospital Service, or other agent of the Treasury Department designated by the Secretary of the Treasury to act as quarantine officer for the United States at the port, shall be accepted by the collector of customs as satisfactory evidence, and the medical officer or agent referred to shall, before granting such certificate, satisfy himself that the matters and things therein stated are true.

Vessels from infected ports not allowed to enter until certificate of free pratique is furnished.

323. Vessels coming from a foreign port or country where cholera, yellow fever, or small-pox is known to have existed in an epidemic form within thirty days preceding their arrival, and vessels or vehicles conveying any person or persons, merchandise, or animals affected with any contagious disease, or having had on board at any time during the thirty days preceding their arrival any case of contagious disease, shall not enter any port of the United States until such disinfection or othes precautionary measures shall have been performed as prescribed by these regulations, and the certificate of the medical officer of the Marine-Hospital Service, or other designated agent of the Treasury Department, shall, in such cases, as in the cases referred to in the preceding paragraph, be accepted by the collector of customs as satisfactory evidence of compliance with said regulations.

Infected vessels required to anchor at quarantine station.

324. For purposes of necessary disinfection of a vessel and its cargo, and of the clothing and baggage of persons on board, the said vessel shall be required to repair to and cast anchor at such place as may be designated by the Secretary of the Treasury, at each port respectively, to be known as the United States Quarantine Station.

Methods of disinfection.

325. The disinfection and other precautionary measures referred to in paragraph 323 shall be carried out under the direction and supervision of the United States quarantine officer at each port respectively, and shall consist of, first, the isolation and treatment of the sick; second, the disinfection of all clothing and baggage liable to be infected; third, the removal of the cargo from the vessel to open lighters, and its thorough disinfection by chemical agents, by exposure to free currents of air, or by burning, as the case may require; and fourth, the cleansing and fumigation of the vessel, or such other methods of disinfection as may from time to time be adopted by the Department.

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