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UNITED STATES
COAST AND GEODETIC SURVEY

CARLILE P. PATTERSON
SUPERINTENDENT

ATLANTIC COAST PILOT

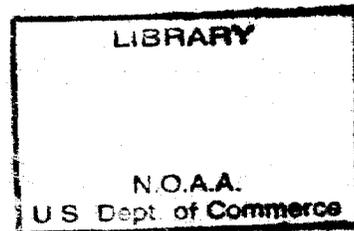
BOSTON TO NEW YORK

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WASHINGTON
GOVERNMENT PRINTING OFFICE
1880

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UNITED STATES
COAST AND GEODETIC SURVEY OFFICE,

WASHINGTON, D. C., *October 1, 1880.*

The necessity for a book of Sailing Directions for the coast and harbors of our Atlantic seaboard being early recognized, was at first partially met by Coast Pilots composed almost exclusively of charts with but few printed directions.

To supply the general demand for more detailed information Messrs. Blunt & March, of Newburyport, Mass., in 1796 published the first Coast Pilot made up entirely of Sailing Directions, with other necessary data, and containing no charts. This volume was compiled by Captain Lawrence Furlong. The following is a copy of its title page:

"The

AMERICAN COAST PILOT,

Containing

The Courses and Distances from Boston to all the principal Harbors, Capes and Headlands included between Passamaquoddy and the Capes of Virginia—with

Directions

For Sailing into, and out of, all the principal Ports and Harbors, with the soundings on the Coast—Also

A TIDE TABLE,

Showing the time of High Water at Full and Change of the Moon, in all the above places—Together

With the Courses and Distances from Cape Cod and Cape Ann, to the shoal of Georges, and from said Capes out in the South and East Channel, and the setting of the current to the Eastward and Westward.

Also

The Latitude and Longitude of the principal Harbors, Capes and Headlands, etc., etc., etc.

By Capt. LAWRENCE FURLONG.

Also—Courses, Directions, Distances, etc., etc., from the Capes of Virginia to the River Mississippi, from the latest Surveys and Observations.

(Approved by experienced Pilots and Coasters.)

THE FIRST EDITION.

Printed at Newburyport, By

Blunt and March.

Sold by them and the principal Booksellers in the United States—1796."

This work contains the following note:—"Edmund M. Blunt will be happy to receive information from every judicious seaman, respecting the different places they may visit on the Coast of America, and corrections for what he has already published, in order to complete his plan of publishing correct directions for all the harbors in the United States."

The table of contents is appended:

(III)

CONTENTS.

“Directions for sailing into Boston; into Salem and Beverly; into Marblehead Harbor; into Cape Ann Harbor; for Cape Cod and Plymouth Harbors; for Cape Cod Harbor; for Newburyport and Ipswich Bay; for Portsmouth, (New Hampshire); from Cape Neddick to Cape Porpoise; from Cape Porpoise to Wood Island; into Portland; for Hussey’s Sound; for Kennebec and Sheepscot Rivers; for Town’s End Harbor; from Town’s End to Monhegan; from Tennant’s Harbor to the Muscle Ridges; through Fox Islands Thoroughfare; from Long Island to the S. W. harbor of Mount Desert; from Mount Desert to Gouldsbrough and Machias; from Machias to Passamaquoddy; to the eastward of the Island of Campo-Bello, between the said island and the Wolves’ Islands.

Description of the coast from Passamaquoddy, showing the making of the land, and the setting of the tides and currents, with the soundings from George’s Bank to the shore.

Directions for the Eastern Coast when you fall in with Grand Manan or Mount Desert Hills.

Remarks on the White Hills.

Directions for Boston Bay; from Cape Cod to Holmes’ Hole; from Holmes’ Hole in Martha’s Vineyard to Cape Cod; from Cape Henlopen to Cape Henry.

Remarks on the land from Cape Henlopen to Chincoteague Shoals.

Directions for sailing in by Cape Henry Light-house; for sailing between the Middle Ground and the Horse-Shoe; for New Point Comfort; to sail into Hampton Road and Norfolk; for running from Cape Henry up the Bay to Baltimore; from New Point Comfort to Potomac River; for going from Cape Henry or Lynn Haven Bay to York River; for passing Cape Hatteras; for coming in from sea for the coast of North Carolina; for sailing into Charleston, (South Carolina); from Charleston Bar to Port Royal; for St. Helena Sound; for Port Royal Harbor.

Winds and Weather on the coast of South Carolina.

Bearings and Distances of Nantucket Shoals, from the Light-house.

Directions for those who fall in with Block Island, and intend to go between Martha’s Vineyard and the Main, and thence through the shoals to the eastward; for those who fall in with Block Island when they are bound for Rhode Island Harbor; from Block Island to Gardiner’s Bay; for Gay Head and Martha’s Vineyard Sound; for New Bedford; from Gardiner’s Island to Shelter Island; from Gardiner’s Island to New London; from No Man’s Land; to go into Sandy Hook, (New York); from Sandy Hook Light-house to Cape May or Light-house on Cape Henlopen; to sail into the Delaware; for sailing into Cape May with an ebb tide; from Reedy Island to Philadelphia.

Tide Table.

The Mouth of St. Mary’s River.

Directions for going to the southward through the Gulf of Florida; for going to New Providence and thence northward through the Gulf; from Providence over the Grand Bahama Bank for Cuba or the Florida Shore; from Port Royal (in Jamaica) to the Gulf of Florida.

A Description of the Tortugas and Florida Keys, and of the General Florida Reef, and the channel between it and the Florida Keys.

Observations on the Florida Stream, with suitable directions.

The Tides.

Directions for sailing into Squam Harbor.

Courses and Distances, from the principal Harbors, Capes and Headlands, between Passamaquoddy and the River Mississippi.

Tide Table.

Latitudes and Longitudes.”

These directions were so faithfully and accurately compiled that many portions are useful at the present time. This valuable little work formed the basis of the subsequent celebrated "Blunt's Coast Pilot," well known to all navigators of American Coasts.

Not discouraged by the magnitude of the task before him, Mr. Edmund M. Blunt, the senior partner of the firm of Blunt & March, and after him his sons, Edmund and George W. Blunt, of New York, persisted in the undertaking, made surveys and prepared sailing directions at their own expense, and to them are we indebted for the survey of the dreaded George's Bank and Shoal, executed in 1821, as well as that of the Bahama Banks and Providence Channel in advance of the survey by the British Admiralty.

The indefatigable labors of the Blunts bore good fruit, and for years their "American Coast Pilot" was the seaman's only guide for our Atlantic and Gulf Coasts. But the progress made by the Coast Survey and its consequent large addition to our knowledge of these coasts made necessary a more elaborate and detailed Coast Pilot, of which the volumes are being issued by the Coast and Geodetic Survey as rapidly as they can be printed from material already in a great measure compiled.

The "American Coast Pilot" by the Blunts included the British Possessions in the Northeast, as well as the West Indies and the Coast of Central and South America.

The Coast Pilot issued by the Coast and Geodetic Survey will include only our own and immediately contiguous coasts and seas.

In addition to volumes of the character of the present one, others meeting every local, special and general want, and in forms most convenient to the navigator, will be issued as rapidly as the amount of the appropriations made by Congress will permit; thus eventually placing at the command of the mariner every direction and information concerning the coast in the various forms most needed for his general and special uses.

THIS, THE SECOND EDITION OF THE SECOND VOLUME OF THE ATLANTIC COAST PILOT, embraces, as did the first edition, the coast from Boston to New York, (including Nantucket, Vineyard and Long Island Sounds, and the Hudson River to Troy,) with such additions and corrections as later surveys and continued investigations have enabled the compiler to make.

The system adopted in this work includes—

- I. A general description of the coast-line and of the shores of the several harbors and thoroughfares.
- II. A detailed description of all dangers and obstructions to navigation on the coast and in the harbors, with directions for avoiding them.
- III. Sailing directions for coasting, and for approaching and entering the harbors.
- IV. Geographical positions of all light-houses and lighted beacons.
- V. Practical information in regard to fog-signals, tides, tidal currents, ice formations, variation of the compass, and life-saving stations.
- VI. Views of the coast and of the entrances to the more important harbors.
- VII. Charts of the coast on a uniform scale, and of the principal harbors.
- VIII. Appendix I, relating to currents at the entrance to the Gulf of Maine.
- IX. Appendix II, Pilot Laws for the harbor of New York.
- X. For marginal references the styles of lettering in use upon the charts of the Coast Survey (being upright for names, &c., applicable to land, and inclined when applicable to water) and also systematic sizes and weights in printed names to indicate the relative importance of coast features.

This second edition embodies the results of the Government surveys made since the publication of the first, and, like that edition, has been compiled by **John Service Bradford**, Assistant, Coast and Geodetic Survey, assisted by Mr. John W. Parsons. It includes the results of previous detailed surveys by the Coast Survey and those which Mr. Bradford's own continuous observations and verification (by visiting every locality along the coast and personally testing all sailing-lines, bearings and courses given) have developed.

Aids to navigation (such as buoys, light-houses, &c.) on the coast and in the several harbors are correct up to September 1, 1880; but as there are frequent changes in these made by the Light-House Board as changes in channels occur, navigators must not rely implicitly on the positions as here laid down, as some new buoys may be placed and some old ones moved to suit the necessities of navigation after this volume goes to press.

The views of the coast and the approaches to the several harbors were drawn by Mr. John R. Barker.

The facts in relation to ice are from an able report by Lieut. C. A. Bradbury, U. S. Navy, Assistant, Coast Survey, who made a careful personal examination of this subject during the very cold winter of 1874-1875.

The compiler has exercised every care to avoid errors; but as absolute accuracy in a work of this class is scarcely possible, it is earnestly hoped that navigators will note all errors or omissions which they may discover or any additional matter they think should be inserted, and forward a notice of the same to the Superintendent of the Coast and Geodetic Survey, Washington, D. C.

Carlile P. Patterson,
Superintendent.

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 * are replaced during the winter months by spar buoys.

ERRATA.

The following errors were discovered after this edition had gone to press :

- Page 6, Line 22.—For “S.” read “S. $\frac{1}{2}$ W.”
- Page 7, Line 23.—For “W. by N.” read “E. by S.”
- Page 8, Line 13.—For “No. 10” read “No. 8.”
- Page 14, Last Line.—For “W. by N.” read “E. by S.”
- Page 52, Line 31.—For “N. by E.” read “N. by W.”
- Page 55, Line 39.—For “eastern” read “western.”

**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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ATLANTIC COAST PILOT.

BOSTON TO NEW YORK.

BOSTON BAY.

Boston Bay is one of the subdivisions of Massachusetts Bay,—being situated at its western end,—and is included between Nahant Head and Strawberry Point. Between these limits it is eleven miles wide, and makes into the land for a distance of four miles. The principal harbor in this bay is Boston Harbor, situated at its western end, and including the subordinate ports of Neponset, Weymouth, Hingham, Cambridge and Charlestown. Nahant Head, the northernmost point of Boston Bay, is in

Latitude..... 42° 25' 7" N.
Longitude..... 70° 53' 59" W.,

and Strawberry Point, its southernmost point, is in

Latitude..... 42° 15' 3" N.
Longitude..... 70° 45' 59" W.

The bay is studded with islands and full of shoals and ledges. Its northwestern part is known as Broad Sound, the entrance to which is contained between Deer Island and Nahant. The rest of the bay forms the approaches to Boston Harbor and the smaller harbors in that vicinity.

BOSTON HARBOR.

The entrance to Boston Harbor lies between Deer Island on the north and Point Allerton on the south, and is three miles and three-quarters wide. The geographical position of the entrance to the Main Ship Channel is

Latitude..... 42° 19' 18" N.
Longitude..... 70° 50' 0" W.,

from which position the distance in a straight line to the city of Boston is six miles and three-quarters. The space between Point Allerton and Deer Island is full of islands, through and among which lead the several channels into Boston Harbor. Of these there are six in common use, viz: The Broad Sound Channels, called, respectively, the North and South channels; Hypocrite Channel; Black Rock Channel; Main Ship Channel; and Back or Western Way,—the Hypocrite Channel and the Back Way being used only by vessels bound out. The Main Ship Channel will be the first described.

Channels in Boston Harbor.

MAIN SHIP CHANNEL.

The entrance to this channel is between Light-house Island on the north and Point Allerton on the south, and is a mile and an eighth wide. This width it holds for a little over a mile and a quarter, when it contracts at The Narrows to a little more than a quarter of a mile. The course is first about W. for a mile and an eighth; then NW. through The Narrows, between Narrows Light-house (on Spit Bar) and George's Island, (on which Fort Warren is built;) then NW. by N. between Lovell's Island and Gallup's Island for three-quarters of a mile, until up with Nix's Mate Beacon; then NW. towards Deer Island, joining the Broad Sound Channels; then W. $\frac{1}{4}$ N. through President's Roads, passing to the southward of Deer Island and to the northward of Long Island and the Spectacle Islands; and then between NW. $\frac{1}{4}$ N. and NW. by W. up to the city, passing between Governor's Island on the north and Castle Island on the south. The whole distance by this channel from the entrance to the anchorage off the city is seven and a half nautical miles.

On approaching the main entrance to Boston from the northward or eastward the first prominent object met with will be the Outer Brewster, a bare rocky island,—the eastermost of the group lying on the northern side of the Main Ship Channel. The Outer Brewster is a mass of black rock, presenting a very rugged appearance and destitute of all vegetation. It lies E. and W., is about a third of a mile long, sixty feet high at its highest part, and its shores are bold-to; but there are outlying reefs to the eastward of it. There is a solitary house on the northern side. About three hundred yards to the westward of Outer Brewster lies Middle Brewster, separated from the former by a narrow and dangerous passage called The Flying Place, which is full of shoals and unfit for strangers. Middle Brewster lies E. and W., and is a third of a mile long and about fifty feet high. It is a mass of bare rock, destitute of vegetation, but presenting a somewhat less rugged appearance than that of the Outer Brewster. A spit or reef makes out in a SW. direction from its western end, and a similar bar extends in a NE. direction from the Great Brewster, nearly meeting the former, and leaving a very shallow passage, a hundred and fifty yards wide and full of shoals, between the two bars. It is only available at high water, and then only by those well acquainted with the dangers.

Outer and Middle Brewsters.

When nearly up with the Outer Brewster, and bound in by the Main Ship Channel, there will be seen to the southward of that island and to the eastward of Boston Light-house a group of bare rocky islets stretching in an **E.** and **W.** direction. These are the **Shag or Egg Rocks** lying on the northern side of the entrance to the Main Ship Channel, half a mile to the southward of the Brewsters, and the same distance to the eastward of Boston Light-house. The rocks are from twenty to twenty-five feet above high water, extend **E.** and **W.** for a third of a mile, (six hundred and fifty yards,) and are pretty bold-to.

Three hundred yards **W.** of the western end of the Egg Rocks, and on the northern side of the entrance, will be seen a low rocky islet of irregular shape, upon which stands a large light-tower with its accompanying dwelling-house and bell-tower. This is **Light-house Island**, (sometimes called **Little Brewster Island**,) and the tower is called **Boston Light-house**. It is a circular tower of rough stone, eighty feet high, with a black lantern on top, from which is shown a revolving white light of the second order of Fresnel from a height of one hundred and eleven feet above the sea. The flashes are at intervals of half a minute, and the light is visible in ordinary weather seventeen miles. Connected with the light-house is an **air-trumpet** for foggy weather, giving blasts seven seconds long at intervals of forty-three seconds. The geographical position of the light-house is

Latitude 42° 19' 39" N.
Longitude 70° 53' 25" W.

The bearings and distances of Boston Light-house are as follows : From

	Miles.
Great Brewster, (highest point,) S SE.	nearly $\frac{1}{2}$
Centre of Middle Brewster, S. by W. $\frac{1}{2}$ W.	$\frac{5}{8}$
Eastern point of Outer Brewster, SW. $\frac{1}{4}$ W.	1 $\frac{1}{2}$
Point Allerton, N. $\frac{1}{2}$ W.	1 $\frac{1}{2}$
Martin's Ledge, (red nun-buoy,) SW. by W. $\frac{1}{2}$ W.	1 $\frac{1}{2}$
Whistling Buoy off Northeast Grave, SW. $\frac{1}{4}$ S.	2 $\frac{1}{2}$
Boston Ledge, (red nun-buoy,) W. $\frac{1}{2}$ S.	1 $\frac{1}{2}$
Bell-buoy on Harding's Ledge, NW. $\frac{1}{4}$ W.	2 $\frac{1}{2}$
Minot's Ledge Light-house, NW. $\frac{1}{4}$ W.	6 $\frac{1}{2}$

About eight hundred yards **N NW.** of Light-house Island (with which it is connected by a long bar or sand-spit, bare at low water) lies a very peculiar-looking island about a hundred feet high, and presenting a precipitous face to seaward, called the **Great Brewster**. Its very remarkable shape renders it a landmark not to be mistaken, but this shape can be more readily explained by a reference to the view of the main entrance. This island lies nearly **NE.** and **SW.**, and is three-eighths of a mile long. Its northern point is high and steep, and the land gradually rises toward the southward—attaining its greatest height about half-way between the northern and southern points. It then descends regularly almost to a level with the water, and again rises with an equal regularity to the southern point, which is nearly as high as the northern end. The whole of this sea-face is a precipitous water-worn cliff, and the summit is smooth and grassy but bare of trees.

From the southwestern end of the Great Brewster a long dry sand-spit or bar extends to the westward for three-quarters of a mile to The Narrows. This is called **Spit Bar** or **Brewster Bar**.

Point Allerton, on the southern side of the entrance to the Main Ship Channel, is a very conspicuous headland. It is a bare hill one hundred and fifteen feet high, presenting a steep, water-worn, cliff-like face to the eastward. Its northern point being separated from the main hill by low land (as in the case of the Great Brewster) gives a very peculiar appearance to the head.

(See view of main entrance.) The summit of Point Allerton is grassy but bare of trees, and the sea-face is protected by a wall of granite. It presents an appearance exactly similar to the Great Brewster, (except that the northern end of the point is the lower,) and its highest point is about midway between its northern and southern ends. They appear as if they had once been joined together and afterwards separated by some violent convulsion of nature. There is a life-boat station in the valley between the northern point and the high cliff to the southward, and a hut of refuge on the beach three hundred and twenty-five yards from the base of the hill—whence a road leads to Hull and Nantasket.

Point Allerton is the northern end of Nantasket Beach—a strip of sand-beach two miles and three-quarters long, extending in a **N NW.** and **S SE.** direction, and separating the large shoal bay, called Hingham Bay, from the ocean. There are several hills on this beach, all of them bare of trees; and another life-boat station three-quarters of a mile below the hut of refuge, at the base of a very prominent hill called **Strawberry Hill**.

At Point Allerton the southern shores of the main entrance turn abruptly to the westward. A narrow strip of beach, known as **Stony Beach**, half a mile long and forty yards wide, connects the western end of the hill with the high land of Hull and Nantasket. This land is formed by two or three regularly sloping hills, from one hundred to one hundred and twenty-five feet high, and covered only with grass, called **Nantasket Hills**. On the highest (which is distinguished from the others by being called simply **Nantasket Hill**) there is an ancient earth-work of considerable size, and the remains of a redoubt may be discerned on the summit of the other. The lower hills present perpendicular cliff-like faces on their northern sides, and it is proposed to protect these by a granite sea-wall such as that which protects Point Allerton.

The villages of **Hull** and **Nantasket** are built on the southwestern sides of these hills, and from seaward parts of them may be seen; but after entering the harbor the hills hide all but one or two of the highest steeples until you are to the westward of the cliffs and are approaching **Nantasket Gut**, when the villages will appear over the low land.

On the northern side of the channel, to the westward of **Great Brewster**, as before mentioned, lies **Spit or Brewster Bar**; and on the western extremity of this bar will be seen an iron screw-pile light-house, called **Narrows Light-house**. It shows a fixed red light, of the fifth order of **Fresnel**, from a height of forty-six feet above the sea, visible twelve miles. The light-house is painted brown, and its geographical position is

Latitude..... 42° 19' 21" N.
 Longitude..... 70° 55' 10" W.

Spit Bar, about three hundred yards **E.** of **Narrows Light-house**, sends off an arm in a southeasterly direction for an eighth of a mile, on the end of which is built a granite beacon surmounted by an iron spindle and cage—all painted red. This arm is **False Spit**, and the beacon is **False Spit Beacon**. In coming up the **Main Ship Channel**, when abreast of this beacon you should haul up to the northwestward to pass through **The Narrows**. This course leaves **Narrows Light-house** to the eastward, and a low island, entirely occupied by a granite fort, to the westward. This island is **George's Island**, and the fort is **Fort Warren**. The island lies **N.** by **W.** and **S.** by **E.**, is three hundred and fifty yards wide and a little over six hundred long, and is altogether occupied by the fort, which is a casemated granite work, surmounted by traverses of earth and faced by earth-work water-batteries. The citadel or central house of the fort, which appears above the parapet when you approach it closely, is a mile and three-eighths **SE.** $\frac{3}{4}$ **E.** from **Loug Island Light-house**; a mile and three-quarters **W.** $\frac{1}{4}$ **S.** from **Boston Light-house**; a little over two miles **NW.** by **W.** $\frac{1}{4}$ **W.** from **Point Allerton**; and a mile and three-eighths **NW.** $\frac{3}{4}$ **N.** from **Nantasket Hill**. Boston is six miles (by the channel) above **Fort Warren**.

False Spit.

George's Island.

The **Black Rock Channel** here opens to the northeastward, between **Narrows Light-house** and **Lovell's Island**. This island lies on the eastern side of **The Narrows**, a quarter of a mile to the northwestward of **Narrows Light-house** and the same distance to the northeastward of **Fort Warren**. It is very irregular in shape, and not over thirty or forty feet high in its highest part, which is near the centre. Its length is a little over half a mile, and its width varies from two hundred and fifty yards (at its southern end) to five hundred, (near the middle.) **Lovell's Island** lies **NW.** and **SE.**, and is bold to on its southwestern side; but its eastern and northern shores are obstructed by long ledges and extensive flats. There are two or three houses on the western shore, near the northern end of the island. The scheme of the Harbor Commissioners contemplated the cutting away of a portion of the western face of **Lovell's Island**, where it is widest, for the purpose of straightening and widening the channel at this point; and this work has been done by the **U. S. Engineers**,—it being intended to obtain a depth of twenty-three feet at mean low water throughout a width of two hundred yards.

Lovell's Island.

On the western side of the channel, and directly opposite **Lovell's Island**, is **Gallup's Island**, narrow and bare of trees, and with a somewhat precipitous face on its northern side. It lies nearly **E.** and **W.**, is over eight hundred yards long, and not quite three hundred wide near its western end, where it is widest. Its eastern end is a low, narrow sand point. The cliff and sea-face of this island are protected from the action of the water by a granite sea-wall nearly a mile long, built under the direction of the **State Harbor Commissioners**, and completed in 1871. There is a group of houses and a wharf on the southern side of the island, but they are not visible from **The Narrows**.

Gallup's Island.

From the western end of **Gallup's Island** shoal water extends in a northerly direction for three-eighths of a mile, and is called **Nix's Mate**. On this is built a large black beacon, called **Nix's Mate Beacon**, which will be seen a little open to the westward when passing between **Lovell's** and **Gallup's** islands. It is composed of a square granite base, surmounted by a pyramidal wooden structure painted black,—marking the centre of **Nix's Mate** and the junction of the **Main** with the **Broad Sound Channels**.

Nix's Mate.

When nearly up with **Nix's Mate Beacon** the course is **NW.** for another pyramidal granite beacon, painted red, which is on the northern side of the **Broad Sound Channels**, and is called **Deer Island Point Beacon**. It is built on the extreme southern point of **Deer Island**, which is covered at one-third flood.

The large island a little open to the eastward, which shows as a bare, green, smoothly sloping hill, somewhat broken at its western end by water-worn cliffs, is **Deer Island**. The wharf at **Point Shirley** and some of the houses on that point are just visible to the westward of the cliffs, and a part of the city **Almshouse** just over them. **Deer Island** lies **NNW.** and **SSE.**, is nearly a mile long, and at its widest part one-third of a mile wide. Both ends of the island are low, and there are no trees except a few planted for ornamental purposes. The **Houses of Correction** and **Hospitals** occupy the western slopes of the hill, near the northern end of the island.

Deer Island.

A channel eighty yards wide separates the northern end of **Deer Island** from **Point Shirley**,—a low sandy point of the mainland. This channel is called **Shirley Gut**, and is sometimes used by steamers plying between Boston and Nahant.

On coming abreast of **Nix's Mate**, **Deer Island Point Beacon** will come in range with a low island about two miles and a half off, and having several large spreading trees upon it. This is **Apple Island**, which is circular in shape, of moderate height, and about an eighth of a mile in diameter. It lies midway between **Point Shirley** and **Governor's Island** and is surrounded by flats. The range of this island and **Deer Island Point Beacon** is one of the **Main Ship Channel marks**.

Apple Island.

After passing Nix's Mate the channel turns to the westward between Deer Island Point Beacon on the north, and a high precipitous head, with a light-house on it, on the south. This head, which shows a steep water-worn cliff to the northward and eastward, is called **Long Island Point**, or **Long Island Head**, and is the northernmost point of Long Island, which lies on the southern side of the Main Channel, and is about a mile and a half long and from one hundred and fifty to six hundred yards wide. It extends in a **NE.** and **SW.** direction, with an undulating surface, and is bare of trees except some ornamental groups in the neighborhood of the hotel and light-house. From the middle of the channel, after passing Nix's Mate, this island will appear as a round hill about eighty feet high, with perpendicular faces,—in other words, only Long Island Head will show, the rest of the island being hidden by it. On the summit appear the light-house and keeper's dwelling, and the tops of the hotel buildings show over the hill. The light-house on the head is an iron tower, painted white, and twenty-seven feet high, showing a fixed white light, of the fourth order of Fresnel, from a height of one hundred and twenty-one feet above the sea, visible sixteen miles. The geographical position of this light-house is

Latitude 42° 19' 46" N.
Longitude 70° 57' 23" W.,

and it bears from

	Miles.
Boston State-House, SE. by E. $\frac{1}{2}$ E.	5
Fort Independence, E SE.	2 $\frac{1}{2}$
Spectacle Islands, (summit of northern island,) E. $\frac{1}{2}$ S.	1 $\frac{1}{2}$
Bunker Hill Monument, SE. $\frac{1}{2}$ E.	5 $\frac{1}{2}$
Deer Island Point Beacon, S. by W. $\frac{1}{2}$ W.	nearly $\frac{1}{2}$

Seen from the southward and eastward, Long Island presents quite a different appearance from that just described. Its full length and undulating surface is then seen, and will be described in its proper place. On passing the head a granite sea-wall will be seen facing it. This wall is of great strength, and is twenty-one hundred feet in length.

Passing Long Island Head, the channel continues to the westward through what is called **President's Roads**; and to the southward of the course will appear two islands of moderate height, with perpendicular faces, and lying **N.** and **S.** of each other.

These are the **Spectacle Islands**, or **The Spectacles**, as they are commonly called, which lie close together, and at low water are joined by a dry sand-bar. The northern island lies nearly **E.** and **W.**, is seven hundred yards long and sixty-five feet high, with cliff-like faces, worn by the action of the water. A group of houses is built near the southern end, where there is a low sand point. The southern island is nearly square,—being about four hundred and fifty yards in diameter. It is sixty-five feet high at its highest point, and, like the northern island, its faces are precipitous except on the southern side, where the shore is low and sandy.

The **Spectacles** lie on the eastern side of the entrance to **Back or Western Way**; and there is a passage between them and **Long Island**, which is often used by coasters, but is unsafe for strangers. The water is shoal around these islands, except on their northern side.

When past **The Spectacles**, on the way through **President's Roads**, a large island, presenting a precipitous face to the northward, and having a group of large houses on its summit, will open to the westward of them. This is **Thompson's Island**, which lies off the entrance to **Neponset River** and on the western side of the entrance to **Back or Western Way**, extends **E NE.** and **W SW.**, and is a mile long. The group of buildings visible on its highest point, surrounded by ornamental grounds, are occupied by a **Farm School**. They stand near the middle of the island, where the land rises to a height of seventy-five feet. It is this group of buildings that is seen from the **Main Ship Channel**, showing between **The Spectacles**. Nearly all the rest of the island is low land, and it is surrounded by flats and shoals. On its southern side it is nearly joined to the mainland by a long, narrow sand-spit of curious shape, which extends off in a **S. by E. $\frac{1}{2}$ E.** direction for five hundred yards,—its southern end being within seventy-five yards of the peninsula of **Squamam**.

The **School** on **Thompson's Island** bears from

	Miles.
Boston State-House, SE. $\frac{1}{2}$ S.	nearly 3 $\frac{1}{2}$
Dorchester Point, SE. by S. $\frac{1}{2}$ S.	1 $\frac{1}{2}$
Fort Independence, S. $\frac{1}{2}$ W.	1 $\frac{1}{2}$
Spectacle Islands, (summit of northern island,) W SW.	1

When fairly past **The Spectacles** the channel turns to the northwestward and passes between **Governor's Island** on the north and **Castle Island** on the south. **Castle Island**, easily recognized by **Fort Independence**, (which is built upon it,) is a small, low island, lying about half a mile to the eastward of **Dorchester Point** and about a mile **NW.** of **The Spectacles**.

Castle Island. The fort, which occupies the whole of the island, is a regular work, built of granite, and surmounted by sod traverses. There is a passage between **Castle Island** and **Dorchester Point**, but it is not safe for strangers. The shores of the island are protected from the action of the sea by a strong sea-wall. The centre of **Fort Independence** bears from

	Miles.
Fort Winthrop, (Governor's Island,) S. by W. $\frac{1}{2}$ W.	$\frac{1}{2}$
Deer Island Hospital, W. by S.	2 $\frac{1}{2}$
Long Island Light-house, W NW.	2 $\frac{1}{2}$
Boston State-House, SE. $\frac{1}{2}$ E.	2 $\frac{1}{2}$
Bunker Hill Monument, SE. by S.	3 $\frac{1}{2}$
Dorchester Point, (extreme southern end,) E. by N. $\frac{1}{2}$ N.	$\frac{1}{2}$

Governor's Island lies on the northern side of the channel, a little over half a mile from Castle Island. It is of irregular shape, about half a mile long, and about seventy feet high at its highest point. The hill at its western end is covered with earth-works, known as **Fort Winthrop**. The southeastern part of the island is much lower, **Governor's Island**, and has a few small water batteries near the shore. Flats extend from it in an **E SE.** direction for one mile, and are bare at low water; but an excellent channel, in which there is not less than three fathoms at low water, leads between it and Apple Island. Fort Winthrop bears from

	Miles.
Apple Island, W. by S. $\frac{1}{2}$ S.	$\frac{1}{2}$
Southern end of Deer Island, W NW.	$2\frac{1}{2}$
Long Island Light-house, NW. $\frac{1}{2}$ W.	$2\frac{1}{2}$
The Spectacles, (northern island,) N NW.	$1\frac{1}{2}$
Boston State-House, E. by S. $\frac{1}{2}$ S.	$2\frac{1}{2}$
Bunker Hill Monument, SE.	$2\frac{1}{2}$

President's Roads, a wide and good anchorage, forming the **Middle Harbor** of Boston, are contained between Governor's Island Flats and Apple Island Flats on the north, Deer Island on the east, Long Island and The Spectacles on the south, and Castle and Governor's islands on the west. It is, within these limits, a mile and three-quarters long and nearly three-quarters of a mile wide.

President's Roads.

To the westward of Governor's and Castle islands lies the Inner Harbor of Boston, which includes all that portion lying abreast of the city up to the Charlestown wharves.

Dorchester Point, a large, high and well-settled peninsula, forming the southeastern extremity of Boston, lies **E. and W.**, and is nearly a mile long from the eastern end of South Boston to the water. Houses are thickly clustered over the whole surface of the peninsula, and upon the highest point is a very conspicuous building with a cupola. This is the **Blind Asylum**, and is one of the marks for coming in by the **Hypocrite Channel**. On the southern side of **Dorchester Point**, Dorchester Point are the approaches to Neponset River,—Thompson's Island forming the eastern side of the entrance; and on the west, low marsh lands join the peninsula to the mainland at Dorchester. On the north and northwest, **South Boston** is separated from Boston proper by a narrow but deep channel, called **Fort Hill Channel**, which leads into **South Bay**.

The city of **Boston** is built upon a peninsula which extends from the mainland in a **NE.** direction, and is two miles and a half long. This peninsula lies between the Fort Hill Channel and Charles River,—the city being washed on three sides. Immediately opposite to the northeastern extremity of Boston, and on the northern side of the Inner Harbor, lies **East Boston**, built on **Noddle's Island**, which was originally composed of salt-meadow, except at its northern end, where the land is higher; but large portions of it have been reclaimed and built upon. The island lies on the eastern side of the harbor, and is separated from Charlestown by the **Mystic River**, and from the city of Chelsea by a narrow and shallow stream, called **Chelsea River**. Bridges connect it with the mainland to the northward.

Between Charlestown and East Boston is the confluence of the Charles and Mystic rivers,—the former running to the eastward between **Cambridge, East Cambridge** and **Charlestown** on the north, and Boston on the south. Its channel is very intricate and narrow and is crossed by several bridges. The **Mystic** takes its rise at **Medford**, three miles and a half above its mouth, and flows through a very crooked channel, but with a general direction about **SE.** to the eastern extremity of Charlestown. Here it is crossed by a bridge, called **Chelsea Bridge**, connecting Charlestown with **Chelsea**. At the bridge the **Mystic** runs about **S SW.** and joins the **Charles** at its junction with the Inner Harbor.

Charles and Mystic Rivers.

The **Charlestown Navy Yard** occupies nearly all of the eastern shore-line of Charlestown, and is very conspicuous on account of its large ship-houses, foundries, smoke-stacks and large granite buildings.

The Inner Harbor of Boston is irregular in shape, and has extensive flats but a deep channel. It is about two miles long, and at its widest part, just off South Boston, is a mile in width; while at its narrowest, between Boston and East Boston, it is only a quarter of a mile wide. Extensive flats fill the large bight between **Dorchester Point** and the eastern extremity of Boston proper, and are called **Dorchester Flats**. These flats it is proposed to reclaim and build upon,—extending the wharf-line to the edge of the channel; and when this is done the Inner Harbor will in no place have a greater width than half a mile.

Inner Harbor.

DANGERS

IN APPROACHING AND ENTERING BOSTON HARBOR BY THE MAIN SHIP CHANNEL.

I. Coming from the Northward.—In approaching the Main Ship Channel from the northward great care should be taken, especially in thick weather, to avoid **The Graves**. These are very dangerous bare rocks, lying in a **N. by E.** and **S. by W.** direction, and united into one ledge at low water,—forming a group six hundred yards long. Four hundred and fifty yards **NE. $\frac{2}{3}$ N.** from the bare ledges is a small but very dangerous rock, bare at low water, called the **Northeast Ledge of The Graves**, or simply the **Northeast Grave**. This rock is marked by a large "Whistling Buoy," sounded by the motion of the sea. It is placed in twelve fathoms

The Graves.

water four hundred yards NE. of the rock, serves to mark both the Northeast Grave and the bare ledges of The Graves proper, and can be heard at the distance of four miles. The following bearings and distances of these dangerous obstructions will be found useful in avoiding them, or in going into Boston Harbor in thick weather, after hearing the sound of the whistle.

The Graves proper bear from

	Miles.
Egg Rock Light-house, S. $\frac{1}{2}$ E. -----	4 $\frac{1}{8}$
Hotel on Nahant Head, S. by E. $\frac{1}{2}$ E. -----	3 $\frac{1}{2}$
Grover's Cliff, SE. by E. $\frac{1}{2}$ E. -----	4 $\frac{1}{2}$
Deer Island Hospital, † E. -----	4 $\frac{1}{8}$
Long Island Light-house, E. by N. $\frac{1}{2}$ N. -----	4 $\frac{1}{4}$
Outer Brewster, NE. by N. $\frac{3}{4}$ N. -----	1 $\frac{1}{2}$
Boston Light-house, NE. by N. -----	2 $\frac{1}{8}$

The Whistling Buoy off the Northeast Grave bears from

	Miles.
Egg Rock Light-house, S. by E. $\frac{1}{8}$ E. -----	4
Long Island Light-house, E. by N. $\frac{3}{4}$ N. -----	4 $\frac{3}{8}$
Boston Light-house, NE. $\frac{3}{4}$ N. -----	2 $\frac{7}{8}$
Minot's Ledge Light-house, NW. by N. $\frac{3}{4}$ N. -----	7 $\frac{3}{8}$

Passing The Graves, the next danger met with, if bound for the Main Ship Channel, is Martin's Ledge, which lies on the northeastern side of the approach, and is marked by a red nun-buoy of the second class (No. 2), placed in six fathoms just to the eastward of it. The ledge lies E. from the Outer Brewster, distant nearly three-quarters of a mile, and has sixteen feet at mean low water and fourteen at low spring tides. The buoy bears S. from the Whistling Buoy off the Northeast Grave, a little over a mile and a half; NE. $\frac{1}{2}$ N. from Boston Ledge, three-quarters of a mile; and NE. $\frac{1}{4}$ N. from Point Allerton Bar buoy, two miles distant.

When up with Martin's Ledge another red nun-buoy will be seen on the northwestern side of the channel. This is on Boston Ledge, which has fourteen feet at lowest tides, and Boston Ledge. lies SW. $\frac{1}{2}$ S. from Martin's Ledge, three-quarters of a mile; SE. by S. $\frac{1}{2}$ S. from the eastern end of Outer Brewster, two-thirds of a mile; and E. by N. from Boston Light-house, nearly a mile and a quarter distant. The buoy is of the second class, marked No. 4, and is placed in six fathoms on the southeastern side of the ledge.

Thieves' Ledge. Thieves' Ledge, or *The Thieves*, as it is generally called, is not in the way of vessels bound in from the northward unless beating to windward, when they may approach it in standing to the southward. It has nowhere less than four and a half fathoms at lowest tides, and is not buoyed. Its bearings and distances are as follows: From

	Miles.
Point Allerton, E. by N. $\frac{1}{4}$ N. -----	2 $\frac{1}{4}$
Boston Light-house, E. by S. $\frac{1}{4}$ S. -----	2 $\frac{3}{8}$
Harding's Ledge Beacon, NE. by N. $\frac{1}{2}$ N. -----	1 $\frac{1}{4}$
Minot's Ledge Light-house, NW. by N. -----	4 $\frac{3}{4}$

Harding's Ledge, or *The Hardings*, is an extensive ledge, composed of a number of bare rocks surrounded by shoal water, and lying a mile and a half from the shore and to the eastward of Point Allerton. It is so far to the southward that it is not even seen by vessels coming from the northward bound in with a fair wind; but, if standing to the southward of Point Allerton, they must beware of it. The shoal ground of this ledge extends over a surface three-eighths of a mile long NE. and SW., and a quarter of a mile wide NW. and SE. A wrought-iron beacon, thirty-one and a half feet high, marks the dry part of the ledge. It is surmounted by a day-mark, consisting of a cast-iron ring or wheel four feet in diameter, set horizontally, with twelve wooden pendants, five feet in length, attached to the rim. The whole is painted black, and is called *Harding's Ledge Beacon*; and its bearings and distances are as follows:

	Miles.
Point Allerton Bar buoy bears NW. by W. -----	1 $\frac{5}{8}$
Boston Light-house NW. -----	2 $\frac{1}{4}$
Martin's Ledge N. -----	2 $\frac{3}{8}$
Whistling Buoy off The Graves N. $\frac{1}{4}$ E. -----	4
Davis' Ledge buoy SE. $\frac{3}{4}$ E. -----	4 $\frac{1}{8}$
Minot's Ledge Light-house SE. $\frac{1}{2}$ E. -----	4 $\frac{1}{4}$

† Largest building visible.

A bell-buoy, painted black, and carrying a five hundred pound bell, is anchored in seven and a half fathoms about three hundred and fifty yards **E NE.** from the beacon; and from it Boston Light-house bears **NW. $\frac{1}{4}$ W.**, distant two miles and three-eighths.

Narrows Light-house and Long Island Light-house in range lead clear of The Hardings, to the northeastward of them.

After passing Boston Ledge there are no dangers met with until you are nearly abreast of Boston Light-house. Here, if beating in, do not approach the southern shore too closely, to avoid Point Allerton Bar, a ledge with eight feet at mean low water, which makes off from the bare ledge of Point Allerton in a **N NE.** direction. Its northern end is nearly seven hundred yards from the point; and on this end, in three and a half fathoms, is placed a black nun-buoy of the second class (No. 3), as a guide to vessels entering Nantasket Roads. **Point Allerton Bar.** The dry ledge of Point Allerton extends off four hundred yards from the shore, and its northern point is marked by a four-sided granite pyramid surmounted by a black cone. This is called Point Allerton Beacon, and is nearly three hundred yards inside of the black buoy on the bar,—bearing from it **SW. by S. $\frac{1}{4}$ S.** There is no passage between the buoy and the beacon except at high water, and then only for light-draught vessels.

On the northern side of the channel, Boston Light-house should receive a berth to the northward of at least a quarter of a mile to avoid the shoals on its southern side—some of which are bare. A rock with fifteen feet at mean low water lies three hundred and fifty yards **S. by E.** from the light-house.

When abreast of Boston Light-house there will be seen a little to the northward, about six hundred yards off, a red spar-buoy. This is on Nash's Rock, which has thirteen feet at low water, lies nearly in mid-channel, and bears from Boston Light-house **SW. $\frac{1}{4}$ W.**, three-eighths of a mile, and from Narrows Light-house **W. by N.**, one mile distant. The buoy is marked No. 6, and is placed in eighteen feet water on the southern side of the ledge. **Nash's Rock.** There is good water on both sides of Nash's Rock; but vessels wishing to pass to the northward of it must give the buoy a berth of three or four hundred yards to the southward.

It is intended to remove Nash's Rock, by blasting, to a depth of twenty-one feet at mean low water.

When past Nash's Rock, and standing to the westward through Nantasket Roads, a number of buoys will be seen ahead and on both hands. These numerous buoys must not be allowed to confuse the judgment, for only three of them belong to this channel. The black nun-buoy* (No. 1) lying close in with the Nantasket shore, on the southern side, is on Toddy Rocks, which lie six hundred yards **N.** from the Nantasket shore and have eleven feet close to the buoy. The nun-buoy painted red and black in horizontal stripes,* which appears a little to the northward of the black buoy, and nearly in range with it when first seen, is on Hunt's Ledge, which has twelve feet at lowest tides, and lies three hundred yards **N.** from Toddy Rocks buoy. The buoy is on the rock, and there is good water all around it; but vessels using the Main Channel do not go near it unless beating to windward. **Hunt's Ledge.**

The two last-mentioned buoys are both placed for use of vessels intending to anchor in Nantasket Roads.

The red nun-buoy* seen nearly ahead is on the southern end of The Centurion, and the black nun-buoy ahead, and close to the red one, is on the northern end of the same shoal. Vessels using the Main Ship Channel pass to the northward of the black buoy; while those using the Back or Western Way pass to the southward of the red buoy. Centurion Rocks, or *The Centurion*, which have twelve feet at lowest tides, lie three-eighths of a mile **SE. $\frac{3}{4}$ S.** from Narrows Light-house, and **W. by S. $\frac{1}{4}$ S.** from Boston Light-house, a mile and an eighth distant. They are on the southern side of the Main Channel, where it joins the Back or Western Way in Nantasket Roads. On the northern end of the ledge, in seventeen feet water, is placed a black nun-buoy* (No. 5) to mark the Main Ship Channel. On the southern end, in thirteen feet water, is placed a red nun-buoy* (No. 2) to mark the Back Way. Vessels bound up the Main Ship Channel sometimes pass to the southward of this buoy, and, rounding it to the westward, steer up for Narrows Light-house, passing to the eastward of the black buoy on George's Island Rocks. **Centurion Rocks.**

The red beacon seen on the northern side of the channel is on *False Spit*, (see page 3,) the southeastern extension of Spit Bar. The beacon, which is surmounted by a red spindle with cage on top, is called **False Spit Beacon**, and is built on that part of the ledge which is dry at low water. About five hundred yards to the westward of this beacon, and just to the eastward of Narrows Light-house, stands a pyramidal granite beacon, which is called **Spit Beacon**. It marks the southwestern extremity of *Spit* or *Brewster Bar*, which is here dry at low water.

The black buoy which lies nearly due **S.** of Narrows Light-house, and a quarter of a mile to the westward of the buoy on the northern end of The Centurion, is on George's Island Rocks, which make off in an easterly direction from George's Island for about six hundred yards; and twelve feet at mean low water is found at this distance from the southeastern point of the island. The buoy, which is a nun* of the third class, marked No. 7, is placed in three fathoms water on the eastern end of the ledge, and lies about four hundred yards **George's Island Rocks.**

S. $\frac{3}{4}$ W. from Narrows Light-house. A channel with four fathoms, which exists between this buoy and The Centurion, is used by sailing-vessels when the wind is scant for the eastern passage.

The eastern shore of George's Island is all shoal, and must receive a good berth in passing through The Narrows.

[*Kelly's Rock*, which formerly lay nearly half a mile SE. by E. $\frac{1}{2}$ E. from Narrows Light-house, and *Tower Rock*, two hundred yards SW. $\frac{1}{2}$ S. from the same light, have been removed by the U. S. Engineers. They have now not less than twenty-three feet at mean low water.]

After passing Narrows Light-house there are no dangers in the channel until you are past Gallup's Island and approach the northern end of Lovell's Island, when a red nun-buoy* will be seen lying off the northwestern point of the latter. This buoy is on **Seventy-four Bar**, which makes out from that point in a westerly direction for three hundred and fifty yards and is nearly all dry at low water. The buoy is placed in seventeen feet on the western end of the shoal and is marked No. 10; and from it the pier on the northern side of the island bears E. $\frac{1}{4}$ S., distant three hundred and fifty yards.

From the northwestern part of Gallup's Island an extensive shoal stretches away to the northward a distance of eight hundred yards. Much of this shoal is dry at low water, and on its northern point, nearly opposite to the red buoy on Seventy-four Bar, are placed a black nun-buoy* (No. 9) and a large stone beacon, also painted black, to the southwestward of the buoy. The buoy

Nix's Mate. is off the northeastern end of a long ledge which makes off from the dry flat on which the beacon is built,—ledge and flat being known by the name of *Nix's Mate* or *Nick's Mate*,—and is a very extensive and dangerous shoal. **Nix's Mate Beacon** is a granite monument with square base, surmounted by an octagonal pyramid. It is painted black, and stands on the dry shoal a little over one hundred and fifty yards S. from its northern end. Deer Island Point Beacon in range with Apple Island leads clear of this shoal. (See ranges for Main Ship Channel.)

The following bearings and distances may be useful: From Nix's Mate Beacon

	Miles.
Long Island Light-house bears W.----- a little over	$\frac{1}{2}$
Pier on northern end of Lovell's Island E.-----	$\frac{1}{2}$
Narrows Light-house (just on with the southeastern point of Lovell's Island) SE. $\frac{1}{8}$ E.-----	$1\frac{1}{4}$
Western point of Gallup's Island S. $\frac{3}{4}$ E.-----	$1\frac{1}{4}$
Old Quarantine Hospital (on Rainsford's Island) SW. by S. $\frac{1}{2}$ S.-----	$1\frac{1}{2}$
Deer Island Point Beacon NW. by N.-----	$\frac{3}{4}$

Rounding Nix's Mate the Broad Sound Channels are entered, and the course leads to the westward through President's Roads. The channel is clear to The Lower Middle,—a distance of nearly two miles; but from Nix's Mate Beacon a shoal bar makes to the northwestward about an eighth of a mile. This spit is known as the *Northwest Spit of Nix's Mate*.

The southern end of Deer Island must not be approached too closely, for a long point, dry at low water, makes off from it in a S. by W. direction for a quarter of a mile; and on the end of this point is built a four-sided granite pyramid, painted red. The shoal is known as **Deer Island Point**, and the beacon as **Deer Island Point Beacon**. It is a guide to vessels coming in by the Broad Sound Channels, and is also one of the Main Ship Channel ranges. From Deer Island Point Beacon

	Miles.
Nix's Mate Beacon bears SE. by S.-----	$\frac{2}{3}$
Long Island Light-house S SW.----- a little over	$\frac{1}{2}$
North Spectacle Island W. by S. $\frac{1}{2}$ S.-----	$1\frac{1}{2}$
Fort Independence W. $\frac{3}{4}$ N.-----	$2\frac{1}{2}$
Apple Island NW.-----	2

Long Island Head is tolerably bold-to, and may be safely approached within two hundred and fifty yards.

Passing through President's Roads on the W. $\frac{1}{2}$ N. course, there will be seen on the northern side of the channel a large red nun-buoy, (in winter a spar with two prongs.) This is on The Lower Middle, a very extensive shoal, lying E SE. and W NW., and a mile in length, with portions of it bare at mean low water. The buoy is placed in seventeen feet on the eastern end of the bar, a little over half a mile N. from the North Spectacle, and is marked No. 6.

The Lower Middle. It marks the dividing point of the channel, which here separates,—one narrow but good channel, called the **North Channel**, passing along the northern side of The Lower Middle, between it and Governor's Island Point; and the other, called the **Main Ship Channel**, passing along the southern side of The Lower Middle, between it and Castle Island; but the latter only should be used by strangers. The red nun-buoy on The Lower Middle bears from Deer Island Point Beacon W. $\frac{3}{4}$ N., distant one mile and a half, and from Long Island Light-house NW. by W. $\frac{1}{4}$ W., distant one mile and a half.

Passing the red buoy on the southeastern end of The Lower Middle, a black nun-buoy,* in range with Castle Island, is seen ahead. This is on Castle Rocks, which make off from the southeastern side of Castle Island in an easterly direction for nearly six hundred yards and are very shoal,—three feet at low water being found one hundred yards inside of the buoy. There is no passage to the westward of the buoy,—the flats extending clear to Dorchester Point. *Castle Rocks.* The buoy is marked No. 7 and is placed in eighteen feet at low water. In beating, while to the northward of it, do not approach Castle Island nearer than three hundred and fifty yards, or go inside of the buoy bearing **SE.** by **S.** $\frac{1}{4}$ **S.** Near the northern end of the island is a wharf extending out in a **NE.** direction, the end of which is in sixteen feet at low water, and will serve as a guide to vessels beating through. They should keep outside of the line from this wharf to the buoy; and if using the lead they must not stand to the westward after striking three and a quarter fathoms.

On the northern side of the channel, nearly opposite to Castle Rocks buoy, will be seen a red nun-buoy.* This is on State Ledge, an obstruction formed by two small rocks lying on the southern side of The Lower Middle, half a mile **W.** by **N.** from the southeastern buoy. One of these rocks has only three feet at low water, and is called *State Ledge.* *Palmyra Rock.* The buoy is placed in seventeen feet to the southward of the ledge and is marked No. 8. (The southern edge of this ledge has been removed to a depth of fourteen feet at mean low water.)

When past the red nun-buoy on State Ledge there will be seen ahead, also on the northern side of the channel, another red nun-buoy,* which is on the *Northwest End of The Lower Middle.* The Lower Middle, as before stated, is a mile in length in an **ESE.** and **WNW.** direction, and the North Channel unites with the Main Ship Channel at its northwestern end. At this point the buoy (which is a nun of the third class, marked No. 10) is placed in seventeen feet water, and bears from Castle Rocks buoy **N.**, one-third of a mile, and from Governor's Island Point **S.**, the same distance.

When abreast of buoy No. 10 another red nun-buoy* is visible, which is on Governor's Island Point, (as the shoal which extends off from the southeastern end of Governor's Island is called.) Its direction is **SW.** by **S.** $\frac{1}{4}$ **S.**, its length a quarter of a mile, and it is dry at low water for half its length. The buoy is of the third class, marked No. 12, and is placed in fourteen feet off the southwestern end of the shoal, and at the northern point of the junction of the North with the Main Ship Channel. Vessels using the North Channel will find the best water midway between this buoy and the buoy on the Northwest End of The Lower Middle. *Governor's Island Point.*

The North Channel, as before stated, runs along the northern side of The Lower Middle, which forms its southern boundary. The northern boundary is formed by very extensive dry flats, quite bold-to, and known as Governor's Island Flats. They extend off from the eastern shore of Governor's Island in an **ESE.** direction for one mile, and their eastern point is the southern point of entrance to Governor's Island Channel, which is at present the deepest channel into Boston, but fit only for steamers. On the northern side of this eastern point is placed a black spar-buoy (No. 1) in three and a half fathoms water. This buoy is not, however, in the North Channel, but marks the southern side of the entrance to Governor's Island Channel. It should not be approached by vessels bound through the North Channel, as the flats extend a quarter of a mile to the southward of it; and on the southern side of these is placed a red spar-buoy (No. 2) in eighteen feet water, as a guide to the North Channel. *Governor's Island Flats.*

When abreast of the red buoy on Governor's Island Point a black nun-buoy* will be seen bearing **NW.** $\frac{1}{2}$ **W.**, and one-third of a mile off. This is on the western side of the channel, and marks a four feet spot on what is known as The Upper Middle. The buoy is a nun of the first class, marked No. 9, and is placed in seventeen feet water on the northeastern side of the shoal. The Upper Middle is not, strictly speaking, a middle ground, but a bar,—in fact, from Castle Island to a point one-third of a mile above The Upper Middle buoy the shoal water extends farther and farther from shore, encroaching upon the channel, and forming part of what is known as South Boston or Dorchester Flats. The Upper Middle is part of this. The bar extends nearly all the way across, and nineteen feet at mean low water is the best water that can be carried over it, except in a very narrow cut made by the U. S. Engineers in the course of their improvements, in which there is twenty-three feet at mean low water. The U. S. Engineers are at present engaged in dredging a channel across it two hundred yards wide and twenty-three feet deep, which will probably be finished before the publication of this work. When completed, an unobstructed passage, with three and three-quarter fathoms at lowest tides, will exist from Point Allerton to the anchorage off Boston. *The Upper Middle.*

When abreast of the black buoy on The Upper Middle, there will be seen on the northern side of the channel, and to the westward of Governor's Island, a black spar-buoy (No. 7). This buoy is placed on the western end of Governor's Island Shoal, making off from the western point of Governor's Island; and properly belongs to Governor's Island Channel, marking its point of junction with the Main Ship Channel. *Governor's Island Shoal.*

A little over one hundred yards to the northwestward of the black buoy on Governor's Island Shoal will be seen a red buoy, and about the same distance still farther to the northwestward a spindle.

Bird Island Flats.

These are on Bird Island Flats, surrounding **Bird Island**, which is an island only at low water. It is covered at half-tide, and the spindle marks its southeastern point. This point is one-third of a mile **NW.** by **W.** from the western end of Governor's Island, and between them passes the deep channel commonly known as Governor's Island Channel. The spindle is iron, has a cage on top, is painted red, and is known as **Bird Island Beacon**. The buoy is a spar (No. 12), and is placed in fourteen feet on the southeastern point of Bird Island Flats. It is seventy-five yards **S. $\frac{1}{2}$ E.** from the spindle, and vessels using the Main Ship Channel pass to the southwestward of it. About one hundred and fifty yards to the southward of this buoy is another red spar (No. 14), marking *a spot with sixteen and a half feet upon it at mean low water.*

On the southwestern side of the channel, and nearly a mile above the black buoy on The Upper Middle, (from which it bears **NW.** by **W. $\frac{1}{4}$ W.**.) will be seen a black nun-buoy* (No. 11). This is on Slate Ledge, which lies on the northern edge of South Boston Flats, nearly midway between Dorchester Point and the Fort Hill Channel. It is two-thirds of a mile from

Slate Ledge.

the nearest shore, and is placed on the northeastern end of the ledge in seventeen feet water. Slate Ledge is dry at low spring tides, and there is no passage inside of it except at high water, and then only for light-draught vessels, as the extensive *South Boston or Dorchester Flats*, which are dry in most places at low spring tides, occupy the whole area inshore of The Upper Middle,—extending from Castle Island to the entrance to Fort Hill Channel. South Boston Flats are to be filled up nearly to the edge of the channel, with the exception of a narrow channel leading along the northern side of the peninsula of South Boston.

There is *a shoal spot with fourteen feet* just to the northward of the buoy on Slate Ledge, lying half a mile **E SE.** from the end of **Long Wharf**, and bearing from the State-House **E.** by **S.**, and from Slate Ledge buoy **N. $\frac{1}{2}$ W.** It is three-eighths of a mile from the latter, and is not marked in any way. It is, however, the intention of the Harbor Commissioners to dredge this portion of the channel to a depth of twenty-three feet at mean low water,—in doing which they will remove this shoal as well as Slate Ledge.

Nearly in mid-channel, and about two hundred and fifty yards from the northeastern point of Boston, is *a shoal spot with fifteen feet at mean low water*; and two hundred yards **S.** of this spot is *another with seventeen feet at low tide.* The former bears **NE. $\frac{2}{3}$ E.** from Boston State-House, and the latter **NE.** by **E. $\frac{1}{2}$ E.** Vessels passing up to the Navy Yard, or into Charles River, may avoid these shoals by keeping close to the line of wharves on either side, according as they are bound to Charlestown or into Charles River. There are no dangers in the Charles River to the eastward of Charlestown Bridge; but beyond the bridge it will be necessary to take a pilot.

In the Mystic River, below Chelsea Bridge, there is *a very long shoal*, forming a kind of middle-ground. It makes off from the southern side of the draw in the bridge in a **S.** by **W.** direction, and extends to the mouth of the river—a distance of three-quarters of a mile. A deep channel runs on its western side, along the Navy Yard piers, into a kind of pocket at the northern end of the yard; and there is also good water on its eastern side, along the line of the East Boston wharves. Fourteen feet at mean low water is the least that can be found on this shoal. There is no buoy on its southern end, but the bearings are as follows: Bunker Hill Monument **NW.** by **W.**, and Boston State-House **SW. $\frac{1}{2}$ W.**; and it is about three hundred yards from either shore. Vessels bound to Chelsea keep close along the line of the East Boston wharves and hold the eastern side of the river aboard until up with the town. (See Sailing Directions.)

Above Chelsea Bridge the Mystic is a mass of flats with a narrow and crooked channel winding among them. It is crossed by three bridges between Charlestown and Medford, and it is impossible to give any sailing directions which would be intelligible. Vessels bound through the bridges must take a pilot.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING BOSTON HARBOR BY THE MAIN SHIP CHANNEL.

I. Coming from the Northward.—The custom heretofore has been, when coming from the northward, to pass to the southward of the Thieves' Ledge; but there is no reason why the entrance should not be made to the northward of that ledge, which has five fathoms on it and is only dangerous in rough weather. On the other hand, Harding's Ledge, which lies on the southern side of the usual entrance, is bare in some places at low water. At night it is especially recommended to pass on the northern side of The Thieves. *To enter by this passage*, the course from Cape Ann is **SW. $\frac{1}{4}$ W.**, (heading for Point Allerton.) On this course, when Boston Light-house bears **W. $\frac{2}{3}$ N.**, a mile and a quarter distant, and you are in ten and a half fathoms water, steer **W. $\frac{2}{4}$ S.** until it bears **N. $\frac{1}{2}$ W.** and is a little abaft the beam. On this course there will be not less than five fathoms and a half. *Now, if intending to anchor in Nantasket Roads*, steer **W. $\frac{1}{2}$ S.**, carrying not less than four fathoms, which will lead you up with the red nun-buoy on the southern end of Centurion Rocks. When past this buoy, if the weather

be fine, haul over towards **Windmill Point**, (the eastern point of entrance to Nantasket *Sailing Direc-*
Gut,) and anchor at pleasure in from three to eight fathoms, gravel and sand. *But, tions--Main*
wishing to make the usual anchorage in the Roads, when up with the red nun-buoy on *Ship Channel*.
 the southern end of Centurion Rocks, (as before,) steer **W SW.**, carrying not less than
 six fathoms, until Long Island Light-house opens well clear of the southwestern point of George's Island
 and the depth is eight fathoms. Vessels should now haul up for the light, and anchor when Boston
 Light-house is well shut in behind George's Island, in from three to four fathoms, fine grey sand.
 Vessels of twenty feet draught or over must anchor farther to the southward than the above range.

If bound up to the city: When Boston Light-house bears **N. $\frac{1}{2}$ W.**, (as before,) steer **W.** for the
 southern end of George's Island until Narrows Light-house bears **NW. $\frac{3}{4}$ N.**, in range with False Spit
 Beacon. This course carries not less than four fathoms and leads up to the black nun-buoy on the
 northwestern end of The Centurion. Thence the course is **NW. $\frac{1}{2}$ W.** for Nix's Mate Beacon, carrying
 not less than four and a half fathoms, and passing between Narrows Light-house and Fort Warren;
 and when the eastern end of Gallup's Island is nearly abeam, (bearing **SW. $\frac{1}{8}$ W.**,) steer **NW.** by **N.**
 for the southern end of Deer Island, having Nantasket Hill exactly astern and carrying not less than
 four and a half fathoms. When Nix's Mate Beacon bears **W. $\frac{1}{4}$ N.**, a quarter of a mile off, steer **NW.**
 for Deer Island Point Beacon, which will be in range with the extreme southwestern point of Apple
 Island. This course continued, keeping the range, will carry not less than four and a half fathoms,
 and will pass close to the buoy on the northeastern end of Nix's Mate, leaving it to the westward.
 Continue the course until Long Island Light-house bears **W SW.**, with six fathoms water, *when steer*
W. $\frac{1}{2}$ N. into *President's Roads*, carrying nothing less than four fathoms. Here anchor anywhere clear
 of the sailing-lines; but the best anchorage is to the southward of the line from Nix's Mate to Castle
 Island, in from six to eight fathoms, good holding-ground.

But, if bound to Boston, continue the **W. $\frac{1}{2}$ N.** course, passing three-eighths of a mile to the
 northward of The Spectacles, until the House of Correction on the northern end of Deer Island bears
NE. by **E. $\frac{1}{4}$ E.** and the highest part of the North Spectacle **SE.** by **S. $\frac{1}{2}$ S.** Here the depth will
 be four and a half fathoms, and the course **NW. $\frac{1}{2}$ N.**, passing to the westward of State Ledge buoy
 and to the eastward of Castle Rocks buoy, and carrying four and a half fathoms, until you are up with
 the black nun-buoy (No. 9) on The Upper Middle. Now alter the course sufficiently to the north-
 ward to give this buoy a berth to the southwestward of seventy-five yards, and when abreast of it steer
NW. $\frac{3}{4}$ N., having the westernmost pier-head in East Boston nearly ahead and the large brick buildings
 in the Navy Yard directly ahead, with Bunker Hill Monument just open to the westward of them.
 On this course there is not less than nineteen feet. This range, (of Bunker Hill Monument just open
 to the westward of the brick buildings in the Navy Yard,) if kept, will make the course good in spite
 of the tidal current; and when Boston State-House bears **NW.** by **W. $\frac{3}{4}$ W.**, **NW.** by **W.** should be
 steered, carrying four and a half fathoms, until it bears **W.** by **N. $\frac{1}{2}$ N.** Here vessels may anchor in
 four and a half fathoms off the southern part of the city, or run into the edge of the flats if of light
 draught, and anchor according to draught. *If bound into Mystic River and up to Chelsea*: When the
 State-House bears **W.** by **N. $\frac{1}{2}$ N.**, (as before,) steer **N.** for about a third of a mile, and then **N.** by **W.**
 $\frac{1}{4}$ W., keeping close to the East Boston wharves while passing them, and holding the eastern bank of
 the river aboard until up with the town. On the course past the East Boston wharves there is not
 less than nineteen feet at mean low water. *If bound to the Navy Yard*: Steer directly for the two
 large buildings on **Navy Yard Point**. Run close to the point, and haul up about **NE.** by **N.** along
 the shore, anchoring at pleasure. On this course there is not less than four and a quarter fathoms.
If bound into Charles River: When Boston State-House bears **W.** by **N. $\frac{1}{2}$ N.**, steer **N.** by **W. $\frac{3}{4}$ W.**,
 only keeping pretty close to the Boston wharves, and rounding the northeastern point of the peninsula
 into Charles River. On this course there is not less than twenty-one feet. If bound to Cambridge,
 vessels must take a pilot.

The above courses pass a mile and a half to the southeastward of the Whistling Buoy off the
 Northeast Grave; nearly half a mile to the eastward of Martin's Ledge; three-quarters of a mile to
 the northward of Thieves' Ledge; a third of a mile to the eastward of Boston Ledge; a third of a
 mile to the southward of Shag Rocks; nearly half a mile to the northward of Point Allerton Bar; a
 hundred and twenty yards to the southward of Nash's Rock buoy; fifty yards to the northward of the

Sailing Directions--Main Ship Channel. black nun-buoy on the northwestern end of Centurion Rocks; two hundred yards to the eastward of George's Island Rocks; two hundred yards to the westward of Seventy-four Bar; fifty yards to the eastward of Nix's Mate buoy; a quarter of a mile to the southward of the red nun-buoy on the eastern end of The Lower Middle; three hundred yards to the eastward of Castle Rocks; two hundred yards to the southwestward of State Ledge; seventy-five yards to the southward of the red nun-buoy on the northwestern end of The Lower Middle; a hundred yards to the southward of the red nun-buoy on Governor's Island Point; from fifty to seventy-five yards to the eastward of The Upper Middle; nearly a quarter of a mile to the northward of Slate Ledge; and about a hundred and fifty yards to the southward of the fourteen feet shoal.

II. Coming from Sea from the Eastward.—If from sea, and the land off Point Allerton is fallen in with, bring Boston Light-house to bear **W NW.**, three miles distant, and Minot's Ledge Light-house **SE. by S.**, four miles; when the depth will be ten and a half fathoms, and the course **W. by N. $\frac{1}{2}$ N.**, carrying not less than five and a half fathoms. On this course Long Island Head and light-house will be a little open to the northward. Continue it until Boston Light-house bears **N. $\frac{1}{2}$ W.**, with five and a half fathoms water, when, *if bound to an anchorage in Nantasket Roads*, steer **W. $\frac{1}{2}$ S.**, carrying four fathoms, until you are up with the red nun-buoy on the southeastern end of Centurion Rocks, when haul over towards the Nantasket shore. *Or*, steer **W SW.** from the Centurion buoy, carrying not less than six fathoms, until Long Island Light-house opens to the westward of George's Island, when the light may be steered for (about **NW. $\frac{1}{2}$ W.**) until Boston Light-house is shut in behind George's Island, and anchorage found in from three and a half to four and three-quarter fathoms. *If bound up to the city:* When Boston Light-house bears **N. $\frac{1}{2}$ W.**, (as before,) the course will be **W.**, following the directions previously given for the Main Ship Channel.

The above courses pass a quarter of a mile to the southward of Thieves' Ledge and three-quarters of a mile to the northward of Harding's Ledge.

APPROACHES TO BOSTON MAIN ENTRANCE FROM THE SOUTHWARD.

A mariner coming from the vicinity of Cape Cod, and bound to Boston, will notice, as a most conspicuous object on approaching the shore, a tall grey light-tower, apparently standing in the water at some distance from the land. This is Minot's Ledge Light-house, built on the outermost of the Cohasset Rocks, on what is called **Minot's Ledge Light-house.** The Outer Minot, a ledge bare at low water. The tower, which is of granite with a bronze lantern on top, is a hundred feet high, and shows a fixed white light, of the second order of Fresnel, from a height of ninety-two feet above the sea, visible sixteen miles. The geographical position of this light-house is

Latitude 42° 16' 9" N.
Longitude 70° 45' 34" W.,

and its bearings and distances are as follows: From

	Miles.
Cape Ann, (Thatcher's Island,) SW. by S. $\frac{1}{2}$ S.	23 $\frac{1}{2}$
Nahant Head, SE. by S. $\frac{1}{4}$ S.	nearly 10 $\frac{3}{4}$
Whistling Buoy off Northeast Grave, SE. by S. $\frac{1}{4}$ S.	7 $\frac{1}{2}$
The Outer Brewster, SE. $\frac{1}{4}$ S.	6 $\frac{1}{2}$
Boston Light-house, SE. $\frac{1}{4}$ E.	6 $\frac{1}{2}$
Point Allerton, SE. by E.	6
Thieves' Ledge, SE. $\frac{1}{4}$ S.	4 $\frac{1}{2}$
Bell-buoy on Harding's Ledge, SE. $\frac{1}{4}$ E.	4 $\frac{1}{2}$
Strawberry Point, (eastern side of Cohasset Entrance,) NE. by N. $\frac{1}{4}$ N.	1
Scituate Light-tower, N. by W. $\frac{3}{4}$ W.	4 $\frac{1}{2}$
Gurnet Light-houses, (entrance to Plymouth,) N NW.	18
Race Point Light-house, (Cape Cod,) NW. $\frac{1}{4}$ W.	26 $\frac{1}{2}$
Eastern extremity of Cape Cod, (above Highland Light-house,) NW. by W.	30

A bell, struck by machinery, will be sounded during thick and foggy weather.

From Minot's Ledge to the shore lie the Cohasset Rocks, a great number of sunken and bare ledges, through and among which winds what is called the **Gangway Passage**. Strangers must never attempt to pass inshore of the light-house, as many of the ledges are not buoyed, and among those that are so marked a stranger would certainly get confused and run ashore.

Strawberry Point, the most easterly point of Boston Bay, lies one mile **SW. by S.** from Minot's Ledge Light-house and marks the southern limits of the bay, as Nahant Head forms its northern end. It will appear, on approaching Minot's Ledge, as a low grassy point, with groups of houses here and there upon its surface, and among them a large hotel. Partly wooded

ADDITIONAL DIRECTIONS.

For the information of those desiring more specific directions as to making the anchorage behind George's Island, when bound through the Main Ship Channel, the following additional matter is given in connection with paragraph 2, page 12 :

The course **W SW.** from the Centurion buoy should be continued until Long Island Light-house opens to the westward of George's Island *on a bearing of NW.*, when the light may be steered for (about **NW. $\frac{1}{2}$ W.**) until, &c., &c.

hills will be seen behind the point and to the eastward of it. The deep cove which opens on the western side of the point, on passing to the westward of the light-house, is **Cohasset Harbor**. The southern shores of this harbor are low, but there is high land back of them which, showing over the low land, gives the appearance of a hilly country. The western shores are hilly and partly wooded, and the town of **Cohasset** is situated at the foot of these hills.

Strawberry Point.

Passing to the westward the country will be found quite hilly and wooded, and sand hillocks are also seen here and there near the beaches. The shore-line is much cut up by coves and indentations, and small islets lie at intervals along the shore. Half a mile to the northeastward of **Cohasset Entrance** is a strip of sand-beach about three hundred and twenty-five yards long, which occupies what was formerly the entrance to a large cove of irregular shape, now known as **Old Harbor**. The beach having formed across the entrance makes of the former cove a pond.

Old Harbor.

A little over a mile and a quarter **W NW.** from **Cohasset Entrance** is an oblong hill fifty feet high, bare of trees and covered with grass, called **Green Hill**. Two bare rocky islets, called the **Black Rocks**, lie **NE.** by **E.** from this hill from a quarter to half a mile off, and there is no passage between them and the hill. A life-boat station, established under the auspices of the Massachusetts Humane Society, lies **E SE.** from **Green Hill**, distant half a mile. From **Green Hill** to the westward a low shore is passed, bounded by a narrow strip of sand-beach, behind which extend large salt-meadows. The higher and wooded lands lie still farther back, in no place approaching the beach nearer than three-eighths of a mile. This low shore extends from the base of **Green Hill**, a little over half a mile in a **NW.** by **W.** direction, to the foot of a group of bare hills, called the **Rockland Hills**, separating the low lands between them and **Green Hill** from the great **Nantasket Beach**, which begins at the foot of their western slopes and extends in an unbroken line two miles and three-quarters **NNW.** to the base of **Point Allerton**.

Black Rocks.

The **Rockland Hills** are from eighty to ninety feet high and bare of trees. Two large summer hotels, the **Atlantic** and **Rockland** houses, are built upon their summits and serve to distinguish them. When abreast of these hills the beacon on **Harding's Ledge** will be plainly discernible to the northward and about a mile off. It is an iron spindle painted black, and carrying a day-mark consisting of a ring or wheel four feet in diameter, set horizontally, with twelve wooden pendants attached to the rim. The bell-buoy will appear a little to the eastward of the spindle. **Nantasket Beach**, as before mentioned, extends in a **NNW.** direction to **Point Allerton**, and separates a large shallow bay, called **Hingham Bay**, from the ocean, and is at no point more than half a mile wide. Several grassy hills rise at intervals just back of the beach, the most prominent of which are **Sagamore Head**, **White Head** and **Strawberry Hill**.

Rockland Hills.

Sagamore Head is grassy, eighty feet high, and has one or two houses upon it: and four hundred yards to the northward of it rises **White Head**, a bare hillock only forty-five feet high. Three hundred yards **N.** of **White Head** there is a hut of refuge, established by the Massachusetts Humane Society. Nearly a mile farther to the northward rises a smooth green hill, bare of trees, and showing a single house upon its summit. This is **Strawberry Hill**, one hundred feet high: and at its base is another life-boat station, established by the same society.

The high bare cliff seen to the northward of **Strawberry Hill** is **Point Allerton**, the southern point of entrance to the **Main Ship Channel**. The land, rising abruptly from the water to a peak, then descending to a small low valley, and then rising again to a height of one hundred and fifteen feet, forms a head of very peculiar appearance. The southern part of the point is a round hill, bare of everything except grass, and with perpendicular faces. There is a life-boat station in the valley, between the northern point and the high cliff to the southward, and a hut of refuge on the beach three hundred and twenty-five yards from the base of the hill. A road leads from this hut to **Hull** and **Nantasket**. The sea-face of **Point Allerton** is protected by a sea-wall of granite.

Point Allerton.

On passing the beacon on **Harding's Ledge**, **Boston Light-house** will be seen directly ahead and on with the southern end of a remarkable looking island, which looks like **Point Allerton**, except that the high round hill is at its northern end, and the sharp peak, like the pommel of a saddle, at its southern end; and the perpendicular cliffs and the grassy surface are exactly similar to those on **Point Allerton**. This is the **Great Brewster**, already described on page 2. So exactly similar has been the action of the sea on this island and **Point Allerton** that they appear as if they had formerly been joined together and afterwards separated by some great convulsion of nature. To the eastward of the **Great Brewster** will appear two bare rocky islands, lying nearly **E.** and **W.** of each other. These are the **Middle Brewster** and **Outer Brewster**, which are merely masses of black rock from fifty to sixty feet high, lying on the northern side of the main entrance.

The Brewsters.

The city of **Boston**, with the dome of the **State-House** rising above the rest of the houses, will be seen in the distance to the westward of the light-house. The two bare islands just to the left are **Lovell's Island** and **Gallup's Island**; and **Fort Warren** is plainly visible just to the northward of **Point Allerton**.

The description of the **Main Ship Channel**, after passing **Point Allerton**, is given on pages 2-5.

DANGERS

IN APPROACHING AND ENTERING BOSTON HARBOR BY THE MAIN SHIP CHANNEL.

II. *Coming from the Southward, from the vicinity of Cape Cod.*—In the approach to the main entrance from the southward the first danger met with is, as before mentioned, **Minot's Ledge**. There

are two rocks on this shoal, known respectively as *The Outer* and *The Inner Minot*. On *The Outer Minot*, upon which is built the light-house, there is no water at low tide; but on *The Minot's Ledge*. Inner Minot there is six feet at mean low water. The Outer Minot bears from Strawberry Point NE. by N. $\frac{1}{4}$ N., one mile, and from Scituate Light-tower N. by W. $\frac{3}{4}$ W., four miles and three-eighths distant. From *The Outer Minot Point Allerton* bears NW. by W., six miles; *Narrows Light-house* NW. by W. Nearly, eight miles; *Boston Light-house* NW. $\frac{1}{4}$ W., six miles and three-quarters; and the eastern end of *Outer Brewster* NW. $\frac{1}{2}$ N., six miles and three-quarters distant.

Davis' Ledge, the northernmost of the *Stellwagen Ledges*, (which lie in a N. and S. line along the shore between Strawberry Point and Scituate,) has fourteen feet at mean low water. It is three-eighths of a mile E. by S. $\frac{1}{2}$ S. from *Minot's Ledge Light-house*, and is marked by a black nun-buoy of the second class (No. 1), placed in five fathoms on the eastern side of the shoal. Vessels must not attempt to pass between this buoy and the light-house.

After passing *Minot's Ledge* there are no dangers in the approaches from the southward until you are up with *The Hardings*; and vessels may stand to within three-quarters of a mile of the shore with safety from *Minot's Ledge* until up with *The Hardings*. There is an excellent passage between *Point Allerton* and this ledge, with from three to six fathoms in it; but there are several shoal spots of sixteen feet, and on this account it is not recommended to vessels of heavy draught.

Harding's Ledge, or *The Hardings*, is an extensive ledge, lying to the eastward of *Point Allerton* and about a mile and a half from shore. There are many rocks bare at low water, and rocks awash upon it,—the shoal ground extending over a surface of three-eighths of a mile square. A wrought-iron beacon, thirty-one and a half feet high, marks the dry part of this ledge. It is surmounted by a day-mark consisting of a cast-iron ring or wheel four feet in diameter, set horizontally, with twelve wooden pendants five feet in length attached to the rim. The whole structure, which is known as *Harding's Ledge Beacon*, is painted black, and its bearings and distances are as follows:

	Miles.
<i>Point Allerton Bar buoy</i> bears NW. by W. -----	1 $\frac{5}{8}$
<i>Boston Light-house</i> NW. -----	2 $\frac{1}{4}$
<i>Martin's Ledge</i> N. -----	2 $\frac{3}{8}$
<i>Whistling Buoy off The Graves</i> N. $\frac{1}{4}$ E. -----	4
<i>Davis' Ledge buoy</i> SE. $\frac{3}{4}$ E. -----	4 $\frac{7}{8}$
<i>Minot's Ledge Light-house</i> SE. $\frac{1}{2}$ E. -----	4 $\frac{1}{2}$

A bell-buoy, painted black and carrying a five hundred pound bell, is anchored in seven and a half fathoms about three hundred and fifty yards ENE. from the beacon; and from it *Boston Light-house* bears NW. $\frac{1}{4}$ W., distant two miles and three-eighths.

Narrows Light-house and *Long Island Light-house* in range lead clear of *The Hardings*, to the northeastward of them.

When past *The Hardings*, *Thieves' Ledge*, or *The Thieves*, is left to the northward over half a mile distant. This ledge has nowhere less than four and a half fathoms at lowest tides, and is not buoyed. It lies E. by N. $\frac{1}{4}$ N. from *Point Allerton*, two miles and a quarter; E. by S. $\frac{1}{4}$ S. from *Boston Light-house*, two miles and three-eighths; NE. by N. $\frac{1}{2}$ N. from *Harding's Ledge Beacon*, one mile and an eighth; and NW. $\frac{3}{4}$ W. from *Minot's Ledge Light-house*, four miles and three-quarters distant.

The course is clear, after passing *The Hardings*, for the entrance to the *Main Ship Channel*, and there are no dangers until you are up with *Point Allerton*, when there will be seen on the southern side of the channel a large black nun-buoy. This is on *Point Allerton Bar*, and is in three fathoms and a half at low water. The bar is a ledge, with eight feet at mean low water, making off from the bare ledge of *Point Allerton* in a NNE. direction. Its northern end is nearly seven hundred yards from the point, and it is upon this end that the buoy is placed, which is of the second class, marked No. 3, and serves as a guide to vessels entering *Nantasket Roads*. The dry ledge of *Point Allerton* extends off four hundred yards from the shore, and its northern point is marked by a four-sided granite pyramid surmounted by a black cone, and called *Point Allerton Beacon*. It is nearly three hundred yards inside of the buoy on the bar, and bears from it SW. by S. $\frac{1}{4}$ S.; and there is no passage between the beacon and the buoy except at high water, and then only for light-draught vessels.

When past *Point Allerton Bar* buoy the next danger met with is on the northern side of the channel, and is called *Nash's Rock*; and from abreast of *Boston Light-house* the red spar-buoy which marks the rock will be seen about six hundred yards off and a little to the northward of the course.

This buoy is on the southern side of the rock, in twenty feet water, and is marked *Nash's Rock*. No. 6. *Nash's Rock* has thirteen feet at low water, and lies nearly in the middle of the channel. It bears from *Boston Light-house* SW. $\frac{1}{8}$ W., three-eighths of a mile, and from *Narrows Light-house* W. by N., one mile distant. There is good water on both sides of this rock;

but vessels wishing to pass to the northward of it must give the buoy a berth of three or four hundred yards to the southward. It is intended to remove Nash's Rock by blasting to a depth of twenty-one feet at mean low water.

When past Nash's Rock, and standing to the westward through Nantasket Roads, a number of buoys will be seen ahead and on both sides, which, however, need not confuse the mariner, as only three of them belong to this channel. The black nun-buoy* lying close in with the Nantasket shore, and bearing about **SW. $\frac{3}{4}$ W.**, is on Toddy Rocks, a ledge of rocks making off in a northerly direction for six hundred yards from the base of Nantasket Hill. Near the northern **Toddy Rocks.** end there is a depth of ten feet at low water, but the ledge is awash at low tides a quarter of a mile from shore. The buoy is of the second class, marked No. 1, and is placed in twenty-two feet water on the northern side of the ledge. These rocks are only in the way of vessels going into Nantasket Roads for an anchorage, or bound to Hingham, Weymouth, or Quincy.

The nun-buoy,* painted red and black in horizontal stripes, which appears a little to the northward of the buoy on Toddy Rocks, is on Hunt's Ledge, a detached rock, with twelve feet at lowest tides, which lies three hundred yards **N.** of Toddy Rocks buoy. The **Hunt's Ledge.** buoy is placed on the rock, and there is good water between it and Toddy Rocks,—the channel being perfectly safe even for strangers. It is much used by vessels going into the Roads for an anchorage or bound into Nantasket Gut.

The red nun-buoy* seen a little to the southward of the course is on the southern end of Centurion Rocks; and the black nun-buoy* just to the northward of it is on the northern end of the same shoal. Vessels using the Main Ship Channel pass to the northward of the black buoy, and those designing to anchor in Nantasket Roads, or bound out from the Back or Western Way, pass to the southward of the red buoy. Centurion Rocks, or *The Centurion*, which have twelve feet at lowest tides, lie three-eighths of a mile **SE. $\frac{3}{4}$ S.** from Narrows Light-house and one mile and an eighth **W.** by **S. $\frac{1}{2}$ S.** from Boston Light-house. They are on the southern side of the Main **Centurion Rocks.** Channel where it joins the Back Way into Nantasket Roads. On the northern end of these rocks, in seventeen feet water, is placed a black nun-buoy* (No. 5), to mark the Main Ship Channel. On the southern end of the ledge, in fifteen feet water, is placed a red nun-buoy* (No. 2), to mark the Back Way. Vessels bound up the Main Ship Channel sometimes pass to the southward of this buoy, and, rounding it on the western side, steer up for Narrows Light-house, leaving George's Island Rocks to the westward.

The black nun-buoy on the northern end of Centurion Rocks bears from the centre of Fort Warren **E.** by **S. $\frac{1}{2}$ S.**, two-thirds of a mile; from Narrows Light-house **SE. $\frac{3}{4}$ S.**, three-eighths of a mile; and from Boston Light-house **W.** by **S. $\frac{1}{2}$ S.**, one mile and an eighth distant.

For dangers in the Main Ship Channel from this point to Boston, see description of that channel, pages 7-10.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING BOSTON HARBOR BY THE MAIN SHIP CHANNEL.

III. Coming from the Southward, from the vicinity of Cape Cod.—When off the Highlands the direct course for Boston Light-house is **NW.** by **W. $\frac{1}{2}$ W.**—keeping to the northward of this course if the wind is **NE.**, and to the westward if it is **SW.**—making due allowance for tide. On the flood-tide with a leading wind the direct course may be made good; but the ebb sets on to Minot's Ledge. Continue the course **NW.** by **W. $\frac{1}{2}$ W.** for Boston Light-house (which will lead between Harding's Ledge and Thieves' Ledge in eight fathoms) until Point Allerton bears **SW.** by **W. $\frac{1}{2}$ W.**, a little more than a mile distant, and Long Island Light-house **W.** by **N. $\frac{3}{4}$ N.**, and you are in six fathoms, "sand and gravel." Now steer **W.** by **N. $\frac{1}{2}$ N.**, carrying not less than five fathoms, until Boston Light-house bears **N. $\frac{1}{2}$ W.**; when a due **W.** course should be steered for the southern end of George's Island, carrying not less than four fathoms, until you are up with the black nun-buoy on the northern end of Centurion Rocks, and Narrows Light-house bears **NW. $\frac{3}{4}$ N.**, in range with False Spit Beacon. The course is now **NW. $\frac{1}{2}$ W.** for Nix's Mate Beacon, following the directions given for the Main Ship Channel, on pages 10-11.

The above courses pass one mile to the northward of Minot's Ledge Light-house; three-eighths of a mile to the eastward of the bell-buoy on Harding's Ledge; half a mile to the southward of Thieves' Ledge; one-third of a mile to the northward of Point Allerton Bar; two hundred yards to the southward of Nash's Rock; and fifty yards to the northward of the black nun-buoy on the north-western end of Centurion Rocks.

If bound into Nantasket Roads.—When Boston Light-house bears **N. $\frac{1}{2}$ W.**, and you are in five and a half fathoms, (as before,) steer **W. $\frac{1}{2}$ S.**, which will lead, with not less than four fathoms, up to the

Sailing Directions--Main Ship Channel. red nun-buoy on the southern end of Centurion Rocks. Pass to the southward of this buoy and steer **W SW.**, carrying not less than six fathoms, and anchor between George's Island and Windmill Point; or, the **W SW.** course may be continued until Long Island Light-house is opened to the westward of George's Island, when steer about **NW. $\frac{1}{2}$ W.** for the light-house, and anchor, when Boston Light-house is shut in behind George's Island, in from three to four fathoms, "fine grey sand;" or, haul over towards the Nantasket shore as soon as the vessel is past The Centurion buoy, and anchor according to draught. The bottom is mostly gravel and sand, and in easterly weather the open roadstead is not safe, as the sea heaves directly in. In such cases vessels of heavy draught, anchored in the open Roads, must run up the channel to President's Roads, or enter Nantasket Gut and anchor under Windmill Point. This last can be safely done, as there is from five to six fathoms water and no obstructions.

The above courses for Nantasket Roads pass two hundred yards to the southward of Nash's Rock buoy; three hundred yards to the northward of Hunt's Ledge buoy; and close to the red nun-buoy on the southern end of The Centurion, leaving it to the northward.

IV. Coming from the Southward, alongshore.—When off Scituate vessels should be careful not to go to the westward of the light-tower bearing **S.**, keeping in from four to six fathoms water, and thus avoiding the Stellwagen Ledges. The best directions that can be given for this approach are, with Scituate Light-tower bearing **S.**, to steer **N.**, carrying not less than six fathoms water, until Boston Light-house bears **NW.** by **W. $\frac{1}{8}$ W.** and the depth is fourteen fathoms. Now steer for the light-house, carrying not less than four and a half fathoms, until Point Allerton bears **SW.** by **W. $\frac{1}{2}$ W.** and Long Island Light-house **W.** by **N. $\frac{3}{4}$ N.** and you are in six fathoms water. The course is now **W.** by **N. $\frac{1}{2}$ N.**, carrying not less than five and a half fathoms, until Boston Light-house bears **N. $\frac{1}{8}$ W.**, when steer **W.** for the southern end of George's Island, following the directions given for the Main Ship Channel, on pages 10-11.

The above courses pass not less than half a mile to the eastward of Stellwagen Ledges; nearly three-quarters of a mile to the eastward of Davis' Ledge; and one mile to the northward of Minot's Ledge.

V. In a vessel of light draught to come alongshore from the Southward and enter Boston Harbor.—Scituate Light-tower may be brought to bear **S. $\frac{1}{2}$ E.**, when a **N. $\frac{1}{2}$ W.** course made good will lead clear of Stellwagen Ledges and a quarter of a mile to the eastward of Davis' Ledge. On this course the least water will be six and a half fathoms. The bearing of Scituate Light-tower, however, must be carefully watched on the flood-tide to prevent being set on to the ledges by the current, as the direction of the current of flood is nearly across the course. When Minot's Ledge Light-house bears **W.** by **S. $\frac{3}{8}$ S.**, five-eighths of a mile distant, (eleven hundred yards,) and Boston Light-house **NW. $\frac{3}{4}$ W.**, and you have fifteen and three-quarter fathoms, "stones, gravel and clay," steer **NW.** by **W.**, which course made good will lead, with not less than seven fathoms, up to the bell-buoy on Harding's Ledge. Pass about three hundred yards to the eastward of this buoy and continue the course, carrying not less than four fathoms, until you are past Point Allerton and Boston Light-house bears **N. $\frac{1}{8}$ W.**; when steer **W.**, following the directions previously given.

The above courses pass first three-eighths of a mile to the eastward, and then four hundred yards to the northward, of Davis' Ledge buoy; about half a mile to the northward of Minot's Ledge Light-house; three hundred yards to the eastward of the bell-buoy on Harding's Ledge; and four hundred yards to the northward of Point Allerton Bar buoy.

In passing Minot's Ledge mariners must be careful that the course is made good, as this ledge is very dangerous even in the smoothest weather. Neither is this channel recommended except to light-draught vessels and in the day-time, as it is necessary to be able to see the beacon on Harding's Ledge in order to keep on the eastern side of it. Should the flood set a vessel to the westward, and the beacon be not visible, she would be very apt to go ashore on the ledges. It may also be remarked that, with Minot's Ledge Light-house bearing **SE.**, a **NW.** course will lead clear of Harding's Ledge.

A vessel using the inshore passage, and wishing to enter the anchorage in Nantasket Roads, or bound into Nantasket Gut, may—when, on the **NW.** by **W.** course, Point Allerton Bar buoy bears **SW.** by **S.**, (or is exactly abeam,) and she is in five fathoms water—steer **W. $\frac{1}{4}$ S.**, passing between Hunt's Ledge and Toddy Rocks, and carrying four and a half fathoms water. Continue this course until Long Island Light-house opens to the westward of George's Island, when steer for the light-house and anchor at discretion.

ADDITIONAL DIRECTIONS.

The following additional matter is given for the information of those desiring to make an anchorage behind George's Island, when bound through the Main Ship Channel; page 16, lines 3 and 4:

Continue the **WSW.** course until Long Island Light-house opens to the westward of George's Island *on a bearing of NW.*, when steer about **NW. $\frac{1}{2}$ W.** for the light-house, &c., &c.

These courses pass nearly four hundred yards to the northward of Point Allerton Bar buoy; a hundred and twenty yards to the southward of the red and black nun-buoy on Hunt's Ledge; and the same distance to the northward of the black nun-buoy on Toddy Rocks.

GENERAL REMARKS

ON THE SET OF THE TIDAL CURRENTS IN THE MAIN SHIP CHANNEL AND ITS APPROACHES.

Mariners, as a general thing, do not pay sufficient attention to ranges when entering harbors with a free wind. The velocity of the tidal current in most of the harbors on the coast of New England demands, however, the closest attention to prevent the vessel being carried aside from the sailing-lines. Such is the case in entering Boston Harbor by the Main Ship Channel.

An inspection of the Current Table on the chart will show the direction and velocity of the current (both of flood and ebb) during the first quarter, at half tide, and during the last quarter. Knowing these, the mariner may allow for the set of the current by changing his course, or may take a range with any two objects whose bearing from him is the same as his true course, and keeping that range will enable him to make his course good. It is always easy to catch a range ahead when on a course prescribed in the Sailing Directions. These courses are laid down as if there were no tidal current; and vessels must either allow for the set of the tide in shaping their course, or must catch a range ahead and keep it until they have run their course out. By attention to head-ranges no one need fear being set upon shoals or ledges, if the sailing-lines laid down are followed. In the southern part of The Narrows the flood-tide sets on to George's Island Rocks; but these rocks are buoyed, which will enable vessels to avoid them.

From Castle Island wharf to President's Roads a good range is a high steeple in the southern part of the city on with the northern line of Fort Independence.

To clear The Lower Middle in the night, keep Long Island Light-house open about a ship's length to the northward of Narrows Light-house. The two lights in range will clear the shoal, but it is rather close work.

To pass to the northward of The Lower Middle, the northern end of Lovell's Island should be opened a little with the southern head of the Great Brewster so as to show a gap between them.

Small vessels may approach Bird Island Flats quite closely with safety by keeping Long Island Light-house open with the high part of Governor's Island. This answers for day and night; but vessels of heavy draught can follow this range only at high water.

False Spit Beacon open a little to the northward of the hotel on Long Island will lead clear of Nash's Rock, to the southward of it. The sailing-lines, however, give the rock more of a berth than this range.

Long Island Light-house shut in a little on Point Allerton, or in the outer saddle, leads clear of Harding's Ledge, to the southward of it.

When Long Island Light-house is open a little to the eastward of The Graves, the passage is clear to the eastward of the Northeast Grave.

To pass between The Graves and The Roaring Bulls, (to the eastward of Green Island,) and to clear the latter, the range is to bring Boston Light-house a little to the eastward of the Middle Brewster, between it and the Outer Brewster, and keep this range until Long Island Light-house opens to the northward of Green Island. Being now clear of The Roaring Bulls, and to the northward of them, haul to the westward to avoid The Graves.

Two miles E. from Boston Light-house the tidal current is weak. Between the light-house and Point Allerton the flood sets up channel; but the ebb, coming from Nantasket Gut, sets somewhat across the channel towards the Spit. Care must be taken accordingly.

Vessels bound up through The Narrows must be careful, after passing False Spit Beacon, not to be set on to George's Island Rocks on the flood-tide, as the current of flood sets through the Black Rock Channel strongly on to George's Island. The ebb sets strongly through the same channel, and vessels coming down from The Narrows, between Lovell's and Gallup's islands, are in danger of being carried by it on to Whiting's Ledge or into the Black Rock Channel.

The flood setting between Gallup's and George's islands may, in light winds, carry a vessel through when going up; but here the channel-way and anchorage are good.

In the northern part of The Narrows the flood during part of its period sets to the southward, but is not strong. The ebb, which is stronger, sets to the northward, and it requires a quick-working vessel to beat down The Narrows against an ebb current.

Near Nix's Mate the ebb will, in light winds, carry vessels out through the Broad Sound Channels.

GENERAL DIRECTIONS

FOR VESSELS BEATING UP BOSTON BAY AND BOUND IN BY THE MAIN SHIP CHANNEL.

A vessel working up to Boston Harbor in the day-time may stretch safely anywhere from Minot's Ledge to Nahant Head until up with The Graves on one side and Harding's Ledge on the other. The northeastern part of The Graves must not be approached nearer than half a mile; and at Harding's Ledge the bell-buoy should receive a berth of at least a hundred yards to the westward and southward.

Inside of the line from The Graves to Harding's Ledge vessels may stand to the southward to within half a mile of the shore, and to the northward to within three-quarters of a mile of the eastern end of the Outer Brewster, or the eastern end of Shag Rocks. When up with the latter, they must not stand farther to the northward than the range of Boston Light-house and Long Island Light-house. In passing Point Allerton care must be taken not to go inside the buoy.

In the day-time a stranger may beat up to the anchorage inside Boston Light-house, making short tacks and keeping two cables' length from Light-house Island; but beyond this it is not safe to go without a pilot. The description of the dangers in the channel (pages 5-10) includes the shoals surrounding the different islands, and will be found the best guide for keeping vessels off the shore; but the ledges and shoals in mid-channel (some of which are not buoyed) require the assistance of a pilot to avoid them if the vessel be of large draught.

To avoid the Cohasset Rocks and Harding's Ledge vessels should not go inside of Boston Light-house bearing **WNW.**; and when within two miles of the light-house should not, when standing to the northward, go beyond it bearing **SW. $\frac{1}{2}$ W.** When near Shag Rocks, care must be taken not to go to the northward of the range of Boston Light-house and Long Island Light-house. For a proper understanding of the above directions, and for other guides to which it is not considered necessary here to refer, an inspection of the chart of Boston Harbor will be found advantageous to a stranger.

HYPOCRITE CHANNEL.

This is the first channel to the northward of the Main Ship Channel. Its entrance lies between Green Island on the north and Little Calf Island on the south, and is three-eighths of a mile wide; but the channel itself is but three hundred yards wide between the curves of eighteen feet at low water, and is not recommended for strangers. Vessels entering by this channel pass to the northward of The Brewsters. From Green Island the channel continues to the westward about a mile and a half to what is called Ram's Head, (where it joins the South Channel of Broad Sound,) and then nearly a mile farther to the westward, towards Long Island Head, joining the Main Ship Channel off Nix's Mate. There is not less than three and a half fathoms water throughout its entire length, but there are a good many sunken ledges, some of which are not buoyed.

A vessel coming from the eastward and intending to enter this channel should, when in thirteen and a half fathoms, bring Boston Light-house to bear **W.** by **S. $\frac{1}{4}$ S.** and Egg Rock Light-house **NNW.** The entrance will then bear nearly **W.**, and will appear as follows:

On the southern side of the entrance the nearest land will be the **Outer Brewster**, which will appear quite differently from its description as given in the approaches to the Main Ship Channel. (See page 1.) It will look much smaller, as this view is end on, and the high bare cliff on the northern end of the **Great Brewster** will show just clear of it to the southward. The low grassy island with its southern end on with the Outer Brewster is **Calf Island**. It is about thirty feet high at its northern end, appears somewhat undulating in outline, is bare of trees, and has only one or two houses upon it, which are close to the southern end and are not seen unless the island is open to the northward of the Outer Brewster. This southern end is only ten or fifteen feet high. **Calf Island** lies off the western end of **Middle Brewster**, from which its southern end is distant a little over three hundred yards, with a shoal passage between them unsafe for strangers. The island lies **N.** and **S.**, and is a little over six hundred yards long. From the point of view above mentioned the northern end will bear **W. $\frac{1}{4}$ S.**, distance three miles and an eighth.

To the northward of **Calf Island** and bearing **W.** will appear a little island about the same height as **Calf Island** and also bare of trees. This is **Little Calf Island**, lying on the southern side of the entrance to Hypocrite Channel, and about a hundred yards in diameter. From **Calf Island** it lies **NE.** by **N.**, an eighth of a mile distant (two hundred and twenty-five yards,) and there is no passage between them.

To the northward of Little Calf Island (and the most northerly of the islands visible from this point of view) will appear a small island of moderate height, having an undulating surface and faced by whitish-looking rocks on its eastern side. This is **Green Island**, which lies on the northern side of the entrance to this channel, bears about **W. $\frac{1}{2}$ N.**, and is in range with the high land in the middle of Deer Island,—the high cliff on the north-eastern face of the latter appearing just to the northward of Green Island. It is bare of trees, lies nearly **N. and S.**, and is an eighth of a mile long. From The Graves it bears **W SW.**, a mile and a quarter, and from the eastern end of Outer Brewster **NW. $\frac{1}{2}$ N.**, one mile distant. From the southern extremity of Green Island extends a line of bare rocks in a **SW. by W.** direction about three hundred and fifty yards,—its southern end marking the northern side of the entrance to Hypocrite Channel.

Just clear of Green Island, to the northward, will appear the public buildings on Deer Island, and north of these the other large buildings on Point Shirley, with the city of Boston in the distance behind it. To the northward of Point Shirley the high cliffs of Winthrop's Head and Grover's Cliff will appear, and as the low land between these heads will not show at this distance, they will look like islands. Winthrop's Head is a precipitous headland one hundred feet high and bare of trees, situated half a mile **NNE.** from Point Shirley, and on the western shore of Broad Sound. To the northward of it runs a sand-beach an eighth of a mile wide and half a mile long to the mainland, about a mile to the southward of Grover's Cliff. This latter headland, the most prominent point between Point Allerton and Nahant Head, lies one mile and one-fifth **N. by E.** from Winthrop's Head. It is backed entirely by marsh; but the point itself is a precipitous headland eighty feet high and bare of trees.

Point Shirley is the southwestern extremity of a very long and narrow peninsula, mostly sand-beach, which extends in a **S. $\frac{1}{2}$ W.** direction from the mainland to the southward of Chelsea Beach. The point itself forms a sort of flat head to the peninsula, lies **NW. and SE.**, and is half a mile long and about one-fifth of a mile wide, (three hundred and seventy-five yards.) Several public buildings are situated on this point.

Deer Island, which lies to the southeastward of Point Shirley, extends in a **N NW. and S SE.** direction, and is nearly a mile long, and a third of a mile wide at its widest part. On approaching it through Hypocrite Channel it will appear as a long, gently sloping green hill, having a flag-staff on its summit. The **Houses of Correction** and other public buildings are situated on the northern end of this island, at the northern base of the central hill, and behind the northeastern cliff. On the eastern slopes of the central hill is a life-boat station, established under the auspices of the Massachusetts Humane Society. Both the northern and southern ends of Deer Island are low, covered with grass only, and there are no trees except those planted for ornamental purposes. On the northern side a channel eighty yards wide separates it from Point Shirley. This passage is known as **Shirley Gut**, and is sometimes used by the steamers plying between Boston and Nahant. The current runs with great velocity, however, and the passage is therefore unfit for strangers.

On entering Hypocrite Channel the southern point of Deer Island will appear ahead, and the square red pyramidal beacon to the southward of it is **Deer Island Point Beacon**. This beacon is on **Deer Island Point**, and vessels must pass to the southward of it.

A little to the southward of Deer Island Point Beacon will be seen in the distance the northernmost **Spectacle Island**, showing as a smoothly outlined hillock with precipitous faces; and next to this the high cliff of **Long Island Head**, with the light-house and keeper's dwelling on the summit. Nearly in range with the hotel on Long Island, and a little to the southward of the head, **Nix's Mate Beacon** may be seen; and the northern end of **Lovell's Island** will mark the southern side of the passage.

This is the appearance presented by the South Channel when viewed from the entrance to Hypocrite Channel, between Green and Little Calf islands.

DANGERS

IN APPROACHING AND ENTERING BOSTON HARBOR BY THE HYPOCRITE CHANNEL.

Here, as in the approach to the Main Ship Channel from the northward and eastward, the first danger met with after passing Nahant Head is The Graves. These are very dangerous bare rocks, lying in a **N. by E. and S. by W.** direction and six hundred yards long. Four hundred and fifty yards **NE. $\frac{2}{3}$ N.** from the bare ledges is a small but very dangerous rock, bare at low water, called the **Northeast Ledge of The Graves**, or simply the **Northeast Grave**. This rock is marked by a large "Whistling Buoy," sounded by the motion of the sea. It is placed in twelve fathoms water four hundred yards **NE.** from the rock, and serves to mark both the Northeast Grave and the ledges of The Graves proper, and may be heard at the distance of four miles. There is from five to nine fathoms of water between the two ledges, but it is unsafe for a stranger to attempt to pass through.

The following bearings and distances of these dangerous obstructions will be found useful in avoiding them, or in going into Boston Harbor in thick weather, after hearing the sound of the whistle: The Graves † proper bear from

† Bearings taken from the NE. extremity of the rocks.

	Miles.
Egg Rock Light-house, S. $\frac{1}{2}$ E. -----	4 $\frac{1}{8}$
Hotel on Nahant Head, S. by E. $\frac{1}{2}$ E. -----	3 $\frac{1}{2}$
Grover's Cliff, SE. by E. $\frac{1}{2}$ E. -----	4 $\frac{1}{2}$
Deer Island Hospital, E. -----	4 $\frac{1}{8}$
Long Island Light-house, E. by N. $\frac{1}{2}$ N. -----	4 $\frac{1}{4}$
Outer Brewster, NE. by N. $\frac{3}{4}$ N. -----	1 $\frac{1}{2}$
Boston Light-house, NE. by N. -----	2 $\frac{1}{3}$

The Whistling Buoy off the Northeast Grave bears from

	Miles.
Egg Rock Light-house, S. by E. $\frac{1}{8}$ E. -----	4
Long Island Light-house, E. by N. $\frac{3}{4}$ N. -----	4 $\frac{3}{4}$
Boston Light-house, NE. $\frac{3}{4}$ N. -----	2 $\frac{3}{4}$
Minot's Ledge Light-house, NW. by N. $\frac{3}{4}$ N. -----	7 $\frac{2}{3}$
Entrance to Hypocrite Channel, NE. $\frac{1}{8}$ E. -----	2

After passing the Whistling Buoy there is no danger in this channel, with a free wind, until you are between Green and Calf islands; but with a head wind, or if the wind be scant, when obliged to stand to the southward, towards The Brewsters, you must beware of Martin's Ledge, which lies three-quarters of a mile E. $\frac{1}{4}$ N. from the Outer Brewster, and has sixteen feet at mean low water and fourteen at lowest springs. It is marked by a red nun-buoy of the second class (No. 2), placed on its eastern point in six fathoms water. This ledge lies on the southern side of the approach to Hypocrite Channel, and the buoy bears from the

Martin's Ledge.

Whistling Buoy off the Northeast Grave S. $\frac{1}{2}$ W., one mile and five-eighths; from Boston Ledge (in the main approach) NE. $\frac{1}{2}$ N., three-quarters of a mile; and from Boston Light-house NE. by E. $\frac{3}{4}$ E., one mile and three-quarters distant.

Tewksbury Rock.

Between Martin's Ledge and the Outer Brewster lies Tewksbury Rock, which has nine feet at mean low water and is not buoyed. It is a small detached rock with deep water on all sides, and lies six hundred yards E. by N. $\frac{1}{2}$ N. from the Outer Brewster and nearly half a mile W. $\frac{1}{2}$ N. from Martin's Ledge buoy. It is in the way only of vessels standing to the southward in the approach to this channel.

After passing The Graves and standing in towards Little Calf Island, there will be seen, on the northern side of the channel, a long ledge, breaking at all times of tide. This is formed by a number of detached rocks called The Roaring Bulls, and sometimes *Sunken Rocks*, lying in a line nearly NE. and SW., with from three to six fathoms water between them. They are bare in most cases at low spring tides, and extend over a surface E. and W. seven hundred yards long,—the most easterly of the group having seven feet at mean low water and about five at low spring tides. The easternmost rock bears from The Graves SW. $\frac{1}{2}$ W., half a mile, and from the Whistling Buoy off the Northeast Grave SW. $\frac{3}{4}$ W., one mile and a quarter distant.

The westernmost rock bears from Green Island E. $\frac{1}{4}$ N., nearly seven hundred yards distant. There is a wide and deep channel, with from four to eight fathoms water, between The Roaring Bulls and The Graves; and an equally clear though not so deep a passage between The Bulls and Green Island,—this latter channel having from four to six fathoms in it;—but neither of these channels is fit for strangers. (See also range for clearing the Bulls in the former passage, page 17.)

The Roaring Bulls are not buoyed, but show themselves by breakers, at high water, in almost all weathers.

The northern shores of Middle Brewster and Outer Brewster are very bold-to and may be closely approached with safety.

Green Island Ledges are the first obstructions met with, after passing The Graves, by a vessel having a free wind through this channel. The passage between Green and Little Calf islands is very narrow,

Green Island Ledges.

obstructed by these ledges on the northern and a sunken rock on the southern side, leaving an available channel only about three hundred yards in width. The Green Island Ledges are a number of bare rocks, out of water at all times of tide, surrounded by many bare and sunken rocks, which extend off from the island in a SW. by W. $\frac{1}{2}$ W. direction for nearly three hundred and fifty yards, and to the southward and southeastward nearly two hundred yards. There are no buoys off these shoals, as the bare rocks serve sufficiently well as marks to avoid them. The rule is to keep about midway between the southernmost bare rock and Little Calf Island.

In following the above directions, however, mariners must beware of a *sunken ledge, with nine feet at low water*, lying N NW. from Little Calf Island, and about one hundred and seventy-five yards distant. It is quite bold-to and is not marked in any way.

When between Green and Little Calf islands there will be seen ahead, and about a quarter of a mile off, a red spar-buoy. This is on Half-Tide Rocks, which lie in the middle of the passage, have two feet at mean low water, and are bare at low springs. They lie SW. by W. $\frac{1}{2}$ W. from Green Island, a little over half a mile, and NW. by W. $\frac{3}{4}$ W. from Little

Half-Tide Rocks.

Calf Island, five hundred yards distant. The buoy, marked No. 2, is placed in rocky bottom on the southern side of the rocks.

The channel now turns to the southward for one-third of a mile and then runs to the westward; and on this westerly course a black can-buoy* will be seen well to the northward. This is on Alderidge's Ledge, which lies between the South Channel and Hypocrite Channel, has only four feet upon it, and is surrounded by deep water. From Half-Tide Rocks it bears **W.** Alderidge's Ledge. $\frac{1}{2}$ **N.**, five-eighths of a mile, (eleven hundred yards,) and from the northeastern point of Lovell's Island **NE. $\frac{3}{4}$ E.**, one mile distant. The buoy is of the second class, and is placed in five fathoms on the northwestern side of the ledge to mark the South Channel. Vessels using the Hypocrite Channel must be careful, therefore, not to approach it nearer than an eighth of a mile, (two hundred and twenty-five yards.)

Between Half-Tide Rocks and Alderidge's Ledge there is a shoal of considerable extent, four hundred yards long in a **NW.** and **SE.** direction, between the lines of three fathoms. There is a spot on this shoal exactly in range between Alderidge's and Half-Tide buoys, which has twelve feet at low water and is not buoyed. From Alderidge's Ledge buoy it bears **E. $\frac{1}{2}$ S.**, three hundred and fifty yards distant, and is generally known as *Twelve Feet Rock*.

When past Alderidge's Ledge a large black can-buoy* will be seen directly ahead and lying some distance off the northeastern end of Lovell's Island. This is on Ram's Head, and marks the junction of this channel with the South Channel. Ram's Head is a long spit or reef, bare at low water, extending **NE.** by **N.** from the northeastern end of Lovell's Island three-eighths of a mile, (nearly seven hundred yards.) The shoal water extends from the northeastern end of the dry Ram's Head. spit three hundred yards to the northeastward,—there being only six feet at mean low water half a mile **NE.** from the point of Lovell's Island. The buoy is of the second class, marked No. 5, and placed in four fathoms off the northeastern point of the shoal. Vessels must be careful, in stretching over towards Lovell's Island when beating through the South Channel, not to go to the southward of the range of this buoy and the southern end of Green Island.

When past Ram's Head buoy the South Channel is entered, and the course is **W.** by **S. $\frac{1}{2}$ S.**, with Long Island Light-house a little to the southward. On this course vessels may enter the Main Ship Channel off Nix's Mate Beacon. There are no dangers in the South Channel, after passing Ram's Head, if the wind be fair. With a head-wind vessels should not stretch too far to the northward, to avoid Little Faun Bar, which is a bar or shoal making off from the Little Faun Bar. eastern face of Deer Island near its southern end. It extends **E.** by **S.** from the island half a mile and is bare at low spring tides. A red can-buoy* of the second class (No. 4) is placed in seventeen feet off the eastern end of the shoal and marks the western limits of the North Channel. The space between the North and South channels at this point is full of shoals having from eight to fifteen feet water upon them. For this reason a vessel of large draught should never attempt the North Channel without a pilot.

In stretching over towards Deer Island, after passing the buoy on Little Faun Bar, vessels must be careful not to approach the island nearer than three-eighths of a mile, (seven hundred yards,) as the water is shoal for a distance of nearly six hundred yards to the eastward of the southern point of the island.

Vessels should also be careful not to approach the southern point of Deer Island nearer than six hundred and fifty or seven hundred yards, as there is a rock, bare at low water, lying a quarter of a mile **S.** from the point. It bears from Deer Island Point Beacon **E.** by **S. $\frac{1}{4}$ S.**, an eighth of a mile distant, (two hundred and twenty-five yards;) and a good rule to avoid it is not to go to the northward of the beacon bearing **NW.** by **W. $\frac{1}{2}$ W.**, in range with the northern point of Governor's Island.

Leaving this rock well to the northward, if the wind be fair, you will pass to the northward of the buoy and the black octagonal pyramid on Nix's Mate, and to the southward of a red granite beacon **S.** of Deer Island. This is on Deer Island Point, a long reef, dry at Deer Island Point. low water, making off from the southern end of Deer Island in a **S.** by **W.** direction for a quarter of a mile. The beacon, which is called **Deer Island Point Beacon**, is on the extreme point of the shoal, and may be approached quite closely with four fathoms water. It bears from

	Miles.
Nix's Mate Beacon, NW. by N.	$\frac{3}{4}$
Long Island Light-house, N NE.	$\frac{1}{2}$
North Spectacle Island, E. by N. $\frac{1}{2}$ N.	1 $\frac{1}{2}$
Fort Independence, E. $\frac{3}{4}$ S.	2 $\frac{1}{2}$
Apple Island, SE.	2

Long Island Head is bold-to and may be approached safely within two hundred and fifty yards. There are no dangers after passing Deer Island Point Beacon until you are through President's Roads and up with The Lower Middle. On the southeastern end of this shoal there is a large red nun-boy* (No. 6), which will be seen nearly ahead just after passing Deer Island Point.

The Lower Middle. The Lower Middle is a very extensive shoal, lying **E SE.** and **W NW.** and a mile long, with portions of it bare at mean low water. The buoy is placed in seventeen feet at mean low water, and lies a little over half a mile **N.** of the North Spectacle Island. (This buoy is replaced in winter by a red spar with two prongs.) It marks the dividing point of the channel, which here separates,—one narrow but good channel, called the **North Channel**, passing along the northern side of the shoal, between it and Governor's Island Point; and the other, called the **Main Ship Channel**, passing along the southern side, between The Lower Middle and Castle Island; but this latter only should be used by strangers. The buoy on the southeastern end of The Lower Middle bears from Deer Island Point Beacon **W. $\frac{3}{4}$ N.**, a mile and a half, and from Long Island Light-house **NW.** by **W. $\frac{1}{2}$ W.**, a mile and a half distant.

When past the buoy on the southeastern end of The Lower Middle there will be seen ahead a black nun-buoy* in range with Castle Island. This is on Castle Rocks, which make off from the southeastern side of Castle Island in an easterly direction for nearly six hundred yards. The ledge is very shoal,—three feet at low water being found one hundred yards inside the buoy,—and there is no passage on the western side of it, as the flats extend clear to Dorchester Point. The buoy is marked No. 7, and is placed in eighteen feet at mean low water on the eastern point of the shoal. In beating in or out vessels must not, while to the northward of this buoy, approach Castle Island nearer than three hundred and fifty yards, or go inside of the buoy bearing **SE.** by **S. $\frac{1}{4}$ S.** Near the northern end of the island there is a wharf extending out in a **NE.** direction,—the end of which is in sixteen feet at mean low water, and will serve as a guide to vessels beating through, which should keep outside of the line from the wharf to the buoy. If the lead is used, vessels must not go to the westward after striking three and a quarter fathoms.

On the northern side of the channel, nearly opposite to the buoy on Castle Rocks, will be seen a red nun-buoy.* This is on State Ledge, an obstruction formed by two small rocks, lying on the southern side of The Lower Middle, half a mile **W.** by **N.** from the southeastern buoy. One of these rocks has only three feet at mean low water, and is called *Palmyra Rock*. (The southern edge of this shoal has been removed to a depth of fourteen feet.) The buoy is placed in seventeen feet on the southern end of the ledge and is marked No. 8.

When past the buoy on State Ledge there will appear ahead, and on the northern side of the channel, another red nun-buoy,* which is on the Northwest End of The Lower Middle. The Lower Middle, as before stated, is a mile in length in an **E SE.** and **W NW.** direction, and the North and Main channels unite at this northwestern end. At this point the buoy, which is of the third class and marked No. 10, is placed in seventeen feet water. From the buoy on Castle Rocks it bears **N.**, nearly one-third of a mile distant, and from Governor's Island Point **S.**, about the same distance. When abreast of this buoy another red nun-buoy* becomes visible about four hundred yards off and on the northern side of the channel. This is on Governor's Island Point,—the shoal extending off from the southeastern end of Governor's Island. Its direction is **SW.** by **S. $\frac{1}{4}$ S.**, its length a quarter of a mile, and it is dry at low water for half its length. The buoy is of the third class, marked No. 12, and is placed in fourteen feet off the southwestern end of the shoal and at the northern point of junction of the Main and North channels. Vessels using the North Channel will find the best water midway between this buoy and that on the Northwest End of The Lower Middle.

The North Channel, as before mentioned, runs along the northern side of The Lower Middle. Its northern boundary is formed by very extensive dry flats, very bold-to, and known as Governor's Island Flats. They extend off from the eastern shore of Governor's Island in an **E SE.** direction for one mile,—their eastern point being also the southern point of entrance to Governor's Island Channel, which is at present the best channel up to Boston for heavy-draught steamers. On the northern side of this eastern point is placed a black spar-buoy (No. 1) in three and a half fathoms water, which is not, however, in the North Channel, but marks the southern side of the entrance to Governor's Island Channel, and should not be approached by vessels bound through the North Channel, as the flats extend a quarter of a mile to the southward from it. On the southern side of these flats, nearly opposite the buoy on the southeastern end of The Lower Middle, is placed a red spar-buoy (No. 2) as a guide to the North Channel.

When abreast of the red buoy on Governor's Island Point, a black nun-buoy* will be seen bearing about **NW. $\frac{1}{2}$ W.** and one-third of a mile off. This is on the western side of the channel, and marks a four feet shoal on what is known as The Upper Middle. The buoy is of the first class and is marked No. 9. The Upper Middle is not, strictly speaking, a middle ground, but a bar,—in fact, from Castle Island to a point one-third of a mile above buoy No. 9 the shoal water extends farther and farther from shore, encroaching upon the channel, and forming part of what is known as South Boston or Dorchester Flats,—The Upper Middle being part of this. The bar extends nearly all the way across, and nineteen feet at mean low water is the best water that can be carried over it, except in a very narrow cut made by the U. S. Engineers in the course of their improvements, in which there is twenty-three feet at mean low water. The U. S. Engineers are at present engaged in dredging a channel across it two hundred yards wide and

Governor's Island Point. Governor's Island. Its direction is **SW.** by **S. $\frac{1}{4}$ S.**, its length a quarter of a mile, and it is dry at low water for half its length. The buoy is of the third class, marked No. 12, and is placed in fourteen feet off the southwestern end of the shoal and at the northern point of junction of the Main and North channels. Vessels using the North Channel will find the best water midway between this buoy and that on the Northwest End of The Lower Middle.

Governor's Island Flats. **E SE.** direction for one mile,—their eastern point being also the southern point of entrance to Governor's Island Channel, which is at present the best channel up to Boston for heavy-draught steamers. On the northern side of this eastern point is placed a black spar-buoy (No. 1) in three and a half fathoms water, which is not, however, in the North Channel, but marks the southern side of the entrance to Governor's Island Channel, and should not be approached by vessels bound through the North Channel, as the flats extend a quarter of a mile to the southward from it. On the southern side of these flats, nearly opposite the buoy on the southeastern end of The Lower Middle, is placed a red spar-buoy (No. 2) as a guide to the North Channel.

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The Upper Middle. **E SE.** direction for one mile,—their eastern point being also the southern point of entrance to Governor's Island Channel, which is at present the best channel up to Boston for heavy-draught steamers. On the northern side of this eastern point is placed a black spar-buoy (No. 1) in three and a half fathoms water, which is not, however, in the North Channel, but marks the southern side of the entrance to Governor's Island Channel, and should not be approached by vessels bound through the North Channel, as the flats extend a quarter of a mile to the southward from it. On the southern side of these flats, nearly opposite the buoy on the southeastern end of The Lower Middle, is placed a red spar-buoy (No. 2) as a guide to the North Channel.

twenty-three feet deep at low water, which will probably be completed before the publication of this work. When so completed, a passage with three and three-quarter fathoms at lowest tides will exist from Point Allerton to the anchorage off Boston.

When abreast of the black buoy on The Upper Middle there will be seen, on the northern side of the channel, to the westward of Governor's Island, a black spar-buoy (No. 7). This buoy is placed on the western end of Governor's Island Shoal, making off from the western point of Governor's Island, and properly belongs to Governor's Island Channel, marking its southern point of junction with the Main Ship Channel.

*Governor's
Island Shoal.*

A little over two hundred yards to the northwestward of the black buoy on Governor's Island Shoal will appear a red spar-buoy; and about the same distance still farther to the northwestward, a spindle. These are on Bird Island Flats. Bird Island is covered at half-tide, and the spindle marks its southeastern point, which is one-third of a mile NW. by W. from the western end of Governor's Island; and between them is the western entrance to the deep channel, commonly known as the Governor's Island Channel. The spindle on the southeastern point of Bird Island is iron and has a cage on top,—all being painted red,—and is known as Bird Island Beacon. The buoy is marked No. 12, and is placed in twelve feet on the southeastern point of Bird Island Flats. It is seventy-five yards S. $\frac{1}{2}$ E. from the spindle, and vessels bound to Boston by the Main Ship Channel must pass to the southwestward of it. About one hundred and fifty yards to the southward of this buoy is another red spar (No. 14), placed as a guide for vessels using the Governor's Island Channel as well as for those which use the Main Ship Channel.

*Bird Island
Flats.*

On the southwestern side of the channel, nearly a mile above the black buoy on The Upper Middle, (from which it bears NW. by W. $\frac{1}{4}$ W.) will be seen a black nun-buoy* (No. 11). This is on Slate Ledge, which lies on the northern side of South Boston Flats, nearly midway between Dorchester Point and Fort Hill Channel. The buoy is two-thirds of a mile from the nearest shore, and is placed on the northeastern edge of the ledge in fifteen feet at mean low water. Slate Ledge is dry at low spring tides, and there is no passage inside of it except at high water, and then only for light-draught vessels, as the extensive South Boston or Dorchester Flats (which are dry in most places at low spring tides) occupy the whole area inshore of The Upper Middle and extend from Castle Island to the entrance to the Fort Hill Channel.

Slate Ledge.

To the northward of Slate Ledge buoy is a small shoal, with fourteen feet, lying half a mile E SE. from the end of Long Wharf, and bearing from the State-House E. by S. and from Slate Ledge buoy N. $\frac{1}{4}$ W. It is three-eighths of a mile from the latter and is not marked in any way. It is, however, the intention of the Harbor Commissioners to dredge this portion of the channel to a depth of twenty-three feet at mean low water, in doing which they will remove this shoal as well as Slate Ledge.

South Boston Flats are to be filled up nearly to the edge of the channel, with the exception of a narrow passage leading along the northern side of the peninsula of South Boston.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING BOSTON HARBOR BY THE HYPOCRITE CHANNEL.

I. *Coming from the Northeastward.*—The course from Cape Ann is SW. $\frac{1}{4}$ W. until Boston Light-house bears W. by S. $\frac{3}{4}$ S. and Egg Rock Light-house N NW., when there will be thirteen and a half fathoms. Thence steer W. $\frac{1}{4}$ N., which course made good will lead, with not less than eight fathoms, safely through between Green and Little Calf islands. On this course the southern end of Deer Island will be a little open to the northward. When Little Calf Island is abaft the beam, bearing S. by E., and the red buoy on Half-Tide Rocks (which will be almost directly ahead) is about four hundred yards off, and Long Island Light-house bears W. by S. and Boston Light-house S., with twelve fathoms, "mud and sand," haul to the southward to avoid Half-Tide Rocks and Alderidge's Ledge, and steer SW. by W. for one-third of a mile, carrying not less than ten fathoms water, until Boston Light-house bears S. by E. $\frac{1}{4}$ E. Deer Island Point Beacon (red stone beacon) will now bear W. $\frac{1}{2}$ N., (open a very little to the southward of the southern end of Castle Island,) and the course is W. $\frac{1}{2}$ N. into the South Channel, which will be entered as soon as you are past Ram's Head buoy. On this course there is not less than nineteen feet; and when Long Island Light-house bears W SW. and Nix's Mate Beacon (black stone beacon) SW. by W. $\frac{1}{4}$ W. and you are in ten fathoms, steer W. by S. $\frac{1}{2}$ S., with the western edge of Long Island Head on with the southern end of South Spectacle Island, and carrying not less than six fathoms. On this course, when Deer Island Point Beacon bears NW. (in range with the western end of Apple Island) and Long Island Light-house SW. by W. $\frac{3}{4}$ W., six and a quarter fathoms will be found in the Main Ship Channel a quarter of a mile to the northward of Nix's Mate Beacon, and W. $\frac{1}{2}$ N. will lead through President's Roads; after which follow the directions given for the Main Ship Channel, on page 11.

Sailing Directions--Hypocrite Channel. The above courses pass eight hundred yards to the northward of Martin's Ledge; about seven hundred yards to the northward of Tewksbury Rock; three-quarters of a mile to the southward of the southern end of The Graves; six hundred yards to the southward of The Roaring Bulls; nearly two hundred yards to the eastward of Half-Tide Rocks; three hundred and fifty yards to the southward of the black buoy on Alderidge's Ledge, and two hundred yards to the southward of the ledge itself; about sixty yards to the northward of Ram's Head buoy; a quarter of a mile to the northward of Nix's Mate Beacon; and a quarter of a mile to the southward of Deer Island Point Beacon.

II. Coming from the Northward, alongshore.—Vessels may pass Egg Rock at a distance of eight hundred yards, and when abreast of it, in thirteen fathoms water, should steer **S.** by **E.**, carrying not less than fourteen fathoms, until abreast of the Whistling Buoy off the Northeast Grave. Pass three-eighths of a mile to the eastward of this buoy, and continue the course until Long Island Light-house bears **W.** by **S.** $\frac{1}{4}$ **S.** and Boston Light-house is just open from behind the Outer Brewster,—bearing **SW.** $\frac{1}{2}$ **W.** The depth will be fourteen fathoms, hard bottom, and the course **SW.** by **W.** $\frac{3}{4}$ **W.**, carrying not less than seven fathoms, until Long Island Light-house is in range with Little Calf Island bearing **W.** $\frac{3}{4}$ **S.**, and Boston Light-house is almost in range with the eastern point of Middle Brewster on a bearing of **SW.** by **S.** $\frac{1}{4}$ **S.** Here there will be ten fathoms; and thence the course is **W.** $\frac{1}{4}$ **N.** through Hypocrite Channel, carrying not less than eight fathoms, until you are within four hundred yards of the buoy on Half-Tide Rocks, with Long Island Light-house bearing **W.** by **S.** The depth will be twelve fathoms, "mud and stones," and vessels must now haul to the southward to avoid Half-Tide Rocks and Alderidge's Ledge,—steering **SW.** by **W.**, and following the directions given above for the Hypocrite Channel.

These courses pass three-eighths of a mile to the eastward of the Whistling Buoy off the Northeast Grave; three-eighths of a mile (six hundred and fifty yards) to the southward of the southern end of The Graves; about six hundred yards to the southward of The Roaring Bulls; and nearly two hundred yards to the southward of Green Island Ledges.

III. Coming from Sea from the Eastward.—When you are in thirteen and a half fathoms, bring Boston Light-house to bear **W.** by **S.** $\frac{3}{4}$ **S.** and Egg Rock Light-house **NNW.**, and steer **W.** $\frac{1}{4}$ **N.**, following the directions given above for this channel.

Hypocrite Channel is not recommended for the use of strangers except in cases of extreme necessity. In view of such a case the bearings of Long Island Light-house and Boston Light-house are given in the Sailing Directions at the turning points in the channel; but strangers will rarely have occasion to use this passage,—the safe and convenient South Channel being just to the northward of Hypocrite Channel and the Main Ship Channel entrance only a mile to the southward.

In the Hypocrite Channel the tidal currents of flood and ebb set in the direction of the channel. Keeping any part of The Graves open to the southward of Green Island clears Half-Tide Rocks.

SOUTH CHANNEL OF BROAD SOUND.

Besides Shirley Gut, there are two channels leading into Boston Harbor from Broad Sound. The westernmost of these, which passes within less than half a mile of Deer Island, is called the North Channel. It is shoal and full of dangers and is not fit for strangers. The eastern channel is called the South Channel, and is almost universally used by coasters of all sizes coming into Boston from the northward and northeastward. The South Channel, which is easy of access and has plenty of water at half-flood for vessels of the largest draught, comes into Broad Sound to the westward of Green Island. It is short and straight, its range is perfect, and strangers may resort to it with safety. The course in is **SW.** by **W.** $\frac{1}{4}$ **W.** for Nix's Mate Beacon until you are past Ram's Head buoy, when the channel turns to the westward and runs between Deer Island and Long Island into President's Roads.

Vessels of light draught often steer **SW.** by **W.** for Long Island Light-house, crossing the shoals between the North and South channels. When coming from the vicinity of Cape Ann and intending to enter by the South Channel, the course is **SW.** by **W.** for Long Island Light-house until Egg Rock Light-house bears **N.** by **E.** $\frac{1}{4}$ **E.**, when steer to the southward until Nix's Mate Beacon is on with the middle of the northern and highest part of the Blue Hills, which is the range for the channel. From this position the entrance is easily recognized by a stranger on referring to the view. The channel will appear open between **Long Island Head** and a long high island with a gently sloping green surface, bare of trees, but having a flag-staff on its summit near its eastern end. Long Island Head is easily recognized by its bold, bare, precipitous face, on which the light-house and keeper's dwelling are seen. The other island with the gently sloping hill is Deer Island. The hill on Deer Island appears to be joined to another at its

northern end, which has an abrupt descent, forming a precipitous face; and over this high bluff will appear the public buildings. Both hills are on Deer Island,—the low land connecting them not being visible at this distance.

To the northward of Deer Island will be seen the open entrance to **Shirley Gut**; and the low sandy point, with houses upon it, which lies on the northern side of the opening, is **Point Shirley**. If the day be clear, **Fort Winthrop**, on **Governor's Island**, may be seen over the northern end of the point,—appearing as a square earthwork on a high smooth hill. To the northward of **Point Shirley** the high bare cliff which rises from the water, appearing like an island, is **Winthrop's Head**. It is joined to **Point Shirley** by a strip of beach not visible at this distance. The city of **Boston**, with the dome of the State-House in the centre, will show to the northward of this head.

If the day be clear there may be seen in the distance, towering above the low hills that are visible to the northward of the city, a slim shaft or tower, looking like a tall grey chimney. This is **Bunker Hill Monument**; and some distance to the northward will appear a high bare cliff apparently rising from the water. This is **Grover's Cliff**, at the southern end of **Chelsea Beach**; and beyond this the land runs away towards **Lynn** and then around to **Nahant Head**.

To the southward of **Deer Island** will be seen **Long Island**; then **Lovell's Island** in range with **Gallup's Island**; then the white walls of **Fort Warren** in the distance; then **Green Island** and **Little Calf Island** at the entrance to **Hypocrite Channel**; then the high, bare, precipitous head of the **Great Brewster**, presenting a very singular appearance, (see view;) then **Middle Brewster**, showing as a bare rocky island, and behind it **Nantasket Hill**, with a couple of steeples rising above it; and **Boston Light-house** will be in range with the eastern end of the **Middle Brewster**.

The channel being open from the above bearing, the course for **Nix's Mate** will lead safely in.

DANGERS

IN APPROACHING AND ENTERING BOSTON HARBOR BY THE SOUTH CHANNEL.

After passing **Nahant Head** there are no dangers encountered in crossing **Broad Sound** until you are nearly up with **The Graves**. These are very dangerous bare rocks, lying in a **N.** by **E.** and **S.** by **W.** direction, united into one ledge at low water, and forming a group six hundred yards long. Four hundred and fifty yards **NE. $\frac{2}{3}$ N.** from the bare ledges is a small but very dangerous rock, bare at low water, called the **Northeast Ledge of The Graves**, or simply the **Northeast Grave**. This rock is marked by a large "Whistling Buoy," (sounded by the motion of the sea,) which is placed in twelve fathoms four hundred yards **NE.** from the rock, and serves to mark both the **Northeast Grave** and the bare ledges of **The Graves** proper. This buoy can be heard at the distance of four miles.

The following bearings and distances will be found useful in avoiding **The Graves**, or in going into **Boston Harbor** in thick weather after hearing the sound of the whistle.

The Whistling Buoy off the **Northeast Grave** bears from

	Miles.
Egg Rock Light-house, S. by E. $\frac{1}{2}$ E. -----	4 $\frac{1}{8}$
Long Island Light-house, E. by N. $\frac{3}{4}$ N. -----	4 $\frac{3}{8}$
Boston Light-house, NE. $\frac{3}{4}$ N. -----	2 $\frac{7}{8}$
Minot's Ledge Light-house, NW. by N. $\frac{3}{4}$ N. -----	7 $\frac{3}{8}$

The bare ledges of **The Graves** † proper bear from

	Miles.
Egg Rock Light-house, S. $\frac{1}{2}$ E. -----	4 $\frac{1}{8}$
Hotel on Nahant Head, S. by E. $\frac{1}{2}$ E. -----	3 $\frac{1}{2}$
Grover's Cliff, SE. by E. $\frac{1}{2}$ E. -----	4 $\frac{1}{2}$
Deer Island Hospital, E. -----	4 $\frac{1}{8}$
Long Island Light-house, E. by N. $\frac{1}{2}$ N. -----	4 $\frac{1}{4}$
Boston Light-house, NE. by N. -----	2 $\frac{1}{2}$

The next danger in the approach to the **South Channel** is **The Roaring Bulls**, but these are not in the way unless you are standing to the southward on a wind. In such cases you must not go to the southward of the line between **Long Island Light-house** and the **Whistling Buoy** off the **Northeast Grave**, or **Long Island Light-house** bearing **W. by S. $\frac{3}{4}$ S.**; and, if of heavy draught, you must not, when near **Green Island**, go farther to the southward than **Long Island Light-house** bearing **W SW.**, to avoid **Maffitt's Ledge**, which has eighteen feet at low water. **The Roaring Bulls** are a number of small rocks lying in a line nearly **NE.** and **SW.**, with from three to six fathoms between them. Several of them are bare at low water of spring tides, and they extend over a surface **E.** and **W.** seven hundred yards long. The most easterly rock has five feet at lowest tides, and bears **SW. $\frac{1}{2}$ W.** from **The Graves**, half a mile distant. The westernmost rock bears **E. $\frac{1}{4}$ N.** from **Green Island**, nearly seven hundred yards distant. There is a wide and deep channel between **The Roaring Bulls** and **The Graves**, and one equally good, but not so wide,

†Bearings taken from the **NE.** extremity of the rocks.

between them and Green Island; but neither channel should be attempted by strangers. (See directions for clearing the Bulls, in the former passage, page 17.)

The Roaring Bulls are not buoyed, but show themselves by breakers at high water in almost all weathers.

Maffitt's Ledge, before referred to, is a detached rock with eighteen feet at mean low water and not buoyed. It lies a quarter of a mile **NW.** by **N.** $\frac{1}{2}$ **N.** from Green Island, on the southern side of the channel; and from it Deer Island Point Beacon bears **W.** by **S.**, two miles and three-quarters distant. There is good water all around it, and vessels of light draught pay no attention to it. A quarter of a mile to the westward of it is *Commissioner's Ledge*, another detached rock, with fifteen feet at mean low water. It lies on the southern side of the channel, with six fathoms water on all sides of it, and bears **W.** from *Maffitt's Ledge* and half a mile **NW.** by **W.** $\frac{1}{4}$ **W.** from Green Island. It is not buoyed, but to avoid it, when in its vicinity, you must not go to the southward of Long Island Light-house bearing **WSW.**, or Nix's Mate Beacon bearing **SW.** by **W.** $\frac{1}{2}$ **W.**

The Devil's Back, or *The Devil's Limb*, as it is sometimes called, is the next danger met with, and is marked by a black can-buoy, which will be seen to the southward, about half a mile off, when abreast of Green Island. It is a very dangerous ledge, three or four hundred yards long, bare in places at extreme low tide, and lies on the southern side of this channel, in a **NE.** by **N.** and **SW.** by **S.** direction. The buoy is of the first class, marked No. 1, and is placed in eighteen feet water on the northern side of the ledge. It bears from Green Island **W.** $\frac{3}{4}$ **N.**, five-eighths of a mile (eleven hundred yards) distant, and from Long Island Light-house **E.** by **N.** $\frac{1}{2}$ **N.**

When up with the buoy on *The Devil's Limb* there will be seen, on the southern side of the channel, two black can-buoys at distances of half a mile and a mile, respectively. The nearest is on *Alderidge's Ledge*, a sunken ledge lying between this channel and the Hypocrite Channel, with only four feet upon it at mean low water. From the black can-buoy on *The Devil's Back* it bears **SW.** by **W.**, half a mile distant; from Deer Island Point Beacon **E.** $\frac{1}{4}$ **N.**; and from Long Island Light-house **E.** by **N.** $\frac{1}{2}$ **N.** There is from five to six fathoms water all around it; but vessels beating up must not go so far to the southward as to bring the buoy in range with Nix's Mate Beacon, to avoid the shoal ground of *Twelve Feet Rock*, which lies between this ledge and Half-Tide Rocks in the Hypocrite Channel. (See also page 21.) The buoy* on *Alderidge's Ledge* is of the second class, marked No. 3, and placed in five fathoms on the north-western side of the shoal. It may be passed close-to, but the sailing-lines pass well to the northward of it.

The other black can-buoy* is on *Ram's Head*, a long spit or reef, bare at low water, extending off for three-eighths of a mile (nearly seven hundred yards) in a **NE.** by **N.** direction from the northeastern end of Lovell's Island. From the end of this dry spit the water is shoal for three hundred yards to the northeastward,—there being only six feet at mean low water half a mile **NE.** from the point of Lovell's Island. The buoy is of the second class, marked No. 5, and is placed in four fathoms off the northeastern point of the shoal. Vessels must be careful, when to the westward of this buoy and stretching over towards Lovell's Island, not to go to the southward of the buoy a little open with the southern end of Green Island until so far to the westward as to fairly open *The Narrows* between Lovell's and Gallup's islands.

In passing *Alderidge's Ledge* buoy and that on *Ram's Head* there will be seen to the northward two red can-buoys and a conical beacon of stone, (with an iron spindle and cage on top, also painted red,) which are all in the North Channel. You must not approach the buoys nearer than half a mile, nor go nearer to the beacon than one mile distant. The easternmost of these buoys (No. 2) is on the

Great Faun Bar. eastern end of Great Faun Bar, which makes off in an easterly direction from the eastern side of Deer Island for a little more than a mile. The buoy marks the western limits of the North Channel, and between it and the South Channel there are shoal soundings. Eleven feet at low water is found between it and *The Devil's Back* buoy, about five hundred yards from the former; and nine feet at mean low water between it and *Alderidge's Ledge* buoy, over eight hundred yards from *Great Faun Bar* buoy. Vessels, therefore, when standing to the northward on or near the line of *Great Faun* and *Alderidge's* buoys cannot count on more than eighteen feet at high water, if to the northward of Nix's Mate Beacon bearing **SW.** by **W.**, or Long Island Light-house bearing **WSW.**

The red conical beacon which is about thirteen hundred yards to the westward of *Great Faun Bar* buoy is called *Great Faun Bar Beacon*, and is built upon the dry part of the bar, near its eastern end. This part of *Great Faun Bar* makes off in an **E.** $\frac{1}{2}$ **N.** direction from the middle of Deer Island, and is dry at low water to a distance of thirteen hundred yards,—or three hundred and fifty yards beyond the beacon. This beacon must not be approached, even by vessels using the North Channel, except at high water, and then not nearer than five hundred yards.

The red can-buoy* to the westward of the buoy on *Great Faun Bar*, and half a mile to the southward of the beacon, is on *Little Faun Bar*, also on the western side of the North Channel. This buoy

is of the second class, marked No. 4, and placed in sixteen feet off the eastern end of the bar, which makes off in an easterly direction for half a mile from the southeastern point of Deer Island. This bar is bare at low spring tides to within two hundred and fifty yards of the buoy.

Vessels beating up the South Channel at high water cannot go to the northward of the line of Little Faun Bar buoy and the black buoy on Alderidge's Ledge and carry over eighteen feet. A good rule is, when not drawing over fifteen feet, if it be half-flood, to go about (when to the westward of Ram's Head buoy) as soon as Deer Island Point Beacon is brought on with the northern end of The Spectacles. There is another range marking the limits of the beating channel in this vicinity, viz: Not to stand to the westward of Long Island Light-house bearing SW. until you are to the westward of Nix's Mate. After that you must only look out for Deer Island Point and the shoal which lies an eighth of a mile E. by S. $\frac{1}{4}$ S. from the beacon, (see also page 21.) The channel is clear between the beacon and Long Island Light-house.

On the course through the South Channel, when past Ram's Head buoy and approaching Nix's Mate, there will be seen, about three-quarters of a mile to the southward and westward, two nun-buoys.* The easternmost, which is red, is on *Seventy-Four Bar*, which lies to the westward of the northern end of Lovell's Island and on the eastern side of the northern entrance to The Narrows. The other, which is black, is on the shoal making off from Nix's Mate Beacon. Both buoys are in the Main Ship Channel at the northern end of The Narrows, where, between Deer Island and Nix's Mate, the South Channel unites with the Main Ship Channel.

The channel, after passing Ram's Head, leads to the westward, between Deer Island and Long Island; and on the northern side will be seen Deer Island Point Beacon, (painted red,) and on the southern side will be seen **Nix's Mate Beacon**, (painted black.) Nix's Mate is the name given to the dry part of the extensive shoal which stretches from the northwestern part of Gallup's Island for eight hundred yards to the northward. The beacon is an eight-sided granite pyramid, rising from a large square base, and painted black; and from it a shoal makes out in a northeasterly direction to the black nun-buoy before mentioned, which is marked No. 9. Deer Island Point Beacon in range with Apple Island leads clear of this shoal.

Nix's Mate.

From Nix's Mate Beacon, Deer Island Point Beacon bears NW. by N., two-thirds of a mile distant, and Long Island Light-house W., a little over half a mile distant.

Deer Island Point is a long reef or point, dry at low water, making off from the southern end of Deer Island in a S. by W. direction for a quarter of a mile; and its southern point is marked by a pyramidal beacon of granite, painted red, which may be approached quite closely. This beacon, which is called **Deer Island Point Beacon**, bears from

Deer Island Point.

Nix's Mate Beacon, NW. by N.-----	Miles.
Long Island Light-house, N NE.-----	a little over
Little Faun Bar buoy, SW. by W. $\frac{1}{4}$ W.-----	2
Apple Island, SE.-----	2

After passing Deer Island there are no obstructions until you are past President's Roads, when there will be seen to the northward a large red nun-buoy.* This is on the southeastern end of The Lower Middle, a long shoal lying E SE. and W NW., and a mile long,—portions of it being bare at mean low water. The buoy is marked No. 6, placed in fifteen feet water on the eastern end of the bar, a little over half a mile N. from the North Spectacle, and is replaced in winter by a red spar-buoy with two prongs. It marks the dividing point of the channel, which here separates,—one narrow but good channel (called the North Channel) passing along the northern side of the shoal, between it and Governor's Island Point, and the other, the Main Ship Channel, passing along the southern side, between the shoal and Castle Island; but this latter only should be used by strangers. The buoy on the southeastern end of The Lower Middle bears from Deer Island Point Beacon W. $\frac{3}{4}$ N., one mile and a half distant, and from Long Island Light-house NW. by W. $\frac{1}{4}$ W., the same distance.

The Lower Middle.

When past the southeastern end of The Lower Middle a black nun-buoy* will be seen ahead, in range with Castle Island, and a red nun-buoy* on the starboard bow. The former is on Castle Rocks, the latter on State Ledge, and the channel leads directly between them. Castle Rocks make off from the southeastern side of Castle Island in an easterly direction for nearly six hundred yards, and the ledge is very shoal,—three feet at low water being found one hundred yards inshore of the buoy. There is no passage between it and the shore,—the flats extending clear to Dorchester Point. The buoy on Castle Rocks is marked No. 7, and is placed in eighteen feet water on the eastern point of the shoal. In beating in or out you must not, while to the northward of this buoy, approach Castle Island nearer than three hundred and fifty yards, or go inside of the buoy bearing SE. by S. $\frac{1}{4}$ S. Near the northern end of the island a wharf extends out in a NE. direction, the end of which is in sixteen feet at low water, and will serve as a guide to vessels beating through, which should keep outside of the line from this wharf to the buoy. If using the lead, you must not go to the westward after striking three and a quarter fathoms.

Castle Rocks.

The red nun-buoy* on the starboard bow, as before mentioned, is on State Ledge, an obstruction formed by two small rocks lying on the southern edge of The Lower Middle, half a mile **W.** by **N.** from the southeastern buoy. One of these rocks has only three feet at low water and is called *Palmyra Rock*. (The southern edge of this ledge has been removed to a depth of fourteen feet at mean low water.) The buoy is in fifteen feet, to the southward of the ledge, and is marked No. 8. When past it there will be seen on the northern side of the channel two red nun-buoys, the nearest of which (about six hundred yards off) is on the Northwest End of The Lower Middle. The Lower Middle, as before stated, is a mile in length in an **ESE.** and **WNW.** direction, and the North and Main Ship channels unite again at this northwestern end,—at which point the buoy is placed in fifteen feet water. It is a nun of the third class, marked No. 10, and vessels using the North Channel pass to the northward of it, while those using the Main Ship Channel pass to the southward. This buoy bears from the black nun-buoy on Castle Rocks **N.**, one-third of a mile distant, and from Governor's Island Point **S.**, about the same distance.

The second red nun-buoy* (which is about four hundred yards **NW.** from the buoy on the upper end of The Lower Middle) is on Governor's Island Point, the shoal extending off from the southeastern end of Governor's Island. Its direction is **SW.** by **S.** $\frac{1}{4}$ **S.**, its length a quarter of a mile, and it is dry at low water for half its length. The buoy is of the third class, marked No. 12, and placed in twelve feet water off the southwestern end of the shoal and at the northern side of the junction of the North and Main Ship channels. Vessels using the North Channel will find the best water midway between this buoy and that on the Northwest End of The Lower Middle.

The northern side of the North Channel is formed by dry flats extending off from Governor's Island in an **ESE.** direction, and called Governor's Island Flats. They are a mile in length, and their eastern point is also the southern point of entrance to Governor's Island Channel, which is at present the deepest channel up to Boston for steamers of heavy draught. On the northern side of this eastern point is placed a black spar-buoy (No. 1) in three and a half fathoms, which is intended to mark the southern side of the entrance to the Governor's Island Channel, and should not be approached by vessels using the North Channel, as the flats extend a quarter of a mile to the southward of it. On the southern side of these flats is placed a red spar-buoy (No. 2) as a guide to the North Channel.

When abreast of the red nun-buoy on Governor's Island Point a black nun-buoy* will be seen bearing **NW.** $\frac{1}{2}$ **W.**, and about one-third of a mile off. This is on the western side of the channel, and marks a four feet shoal on what is known as The Upper Middle. The buoy is of the first class and is marked No. 9. The Upper Middle is not, strictly speaking, a middle ground, but a bar,—in fact, from Castle Island to a point one-third of a mile above The Upper Middle buoy the shoal water extends farther and farther from shore, encroaching upon the channel, and forming part of what is known as the South Boston or Dorchester Flats. The bar extends all the way across, and nineteen feet at mean low water is the best that can be carried over it, except in a very narrow cut made by the U. S. Engineers in the course of their improvements, and which has twenty-three feet. The U. S. Engineers are at present engaged in dredging a channel across it two hundred yards wide and twenty-three feet deep at mean low water. This channel will probably be completed before the publication of this work, and when so completed an unobstructed passage, with three and three-quarter fathoms at lowest tides, will exist from Point Allerton to the anchorage off Boston.

When abreast of the black nun-buoy on The Upper Middle there will be seen on the northern side of the channel, and to the westward of Governor's Island, a black spar-buoy (No. 7). This buoy is placed on the western end of Governor's Island Shoal, (making off from the western point of Governor's Island,) and properly belongs to Governor's Island Channel, marking its southern point of junction with the Main Ship Channel.

A little over two hundred yards to the northwestward of the black spar-buoy on Governor's Island Shoal will be seen a red spar-buoy; and about the same distance still farther to the northwestward, a spindle. These are on Bird Island Flats, surrounding Bird Island, which is covered at half-tide. The spindle marks its southeastern point, which is one-third of a mile **NW.** by **W.** from the western end of Governor's Island. Between them lies the western entrance to the deep channel known as Governor's Island Channel. Bird Island Beacon is iron and has a cage on top, all painted red. The buoy is marked No. 12, and is placed in twelve feet water on the southeastern point of the flats. It is seventy-five yards **S.** $\frac{1}{2}$ **E.** from the spindle, and vessels bound to Boston by the Main Ship Channel pass to the southwestward of it. Just to the southward of this buoy, distant about one hundred and fifty yards, is placed another red spar, marked No. 14.

On the southwestern side of the channel, and nearly a mile above the black nun-buoy on The Upper Middle, (from which it bears **NW.** by **W.** $\frac{1}{4}$ **W.**.) will be seen a black nun-buoy* (No. 11). This is on Slate Ledge, which lies on the northern edge of South Boston

ADDITIONAL DIRECTIONS.

For the convenience of mariners who may not be able to make the buoys on Castle Rocks and the southeastern end of The Lower Middle, on the course through President's Roads, the following additional directions are given :

When, on the **W. by N.** course through President's Roads, you come exactly in line between the highest part of Governor's Island and the summit of the North Spectacle Island,—having the former bearing **N N W.** and the latter **S S E.**,—with the northern end of Castle Island bearing **N W. $\frac{3}{4}$ W.**, steer **N W. $\frac{1}{2}$ N.** and follow the directions for the Main Ship Channel.

Flats, nearly midway between Dorchester Point and Fort Hill Channel. It is two-thirds of a mile from the nearest shore, and the buoy is placed on its northeastern end in fifteen feet water. Slate Ledge is dry at low spring tides, and there is no passage inside of it except at high water, and then only for light-draught vessels, as the extensive South Boston Flats (which are dry in most places at low spring tides) occupy the whole area inshore of The Upper Middle, extending from Castle Island to the entrance to the Fort Hill Channel.

To the northward of Slate Ledge buoy is a *small shoal* lying half a mile **ESE.** from the end of Long Wharf, and bearing from the State-House **E.** by **S.** and from Slate Ledge buoy **N.** $\frac{1}{8}$ **W.** It is three-eighths of a mile from the latter, and is not marked in any way. *Fourteen and a half feet is the shoalest water at mean low tides;* but it is the intention of the Harbor Commissioners to dredge this portion of the channel to a depth of twenty-three feet at mean low water, in doing which they will remove this shoal as well as Slate Ledge.

South Boston Flats are to be filled up nearly to the edge of the channel, with the exception of a narrow passage along the northern side of the peninsula of South Boston.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING BOSTON HARBOR BY THE SOUTH CHANNEL.

I. *From Cape Ann in the day-time.*—When a mile to the southeastward of the light-houses on Thatcher's Island, in twenty-five fathoms water, steer **SW.** $\frac{3}{4}$ **W.**, carrying not less than fifteen fathoms, until you are exactly between Nahant Head and Minot's Ledge Light-house. Nix's Mate Beacon will now bear **SW.** by **W.** $\frac{1}{4}$ **W.** and will be in range with the northernmost and highest of the Blue Hills. Now steer that course, keeping the range and carrying not less than twenty feet, until Long Island Light-house bears **W.** by **S.** $\frac{3}{4}$ **S.** and Deer Island Point Beacon **W.** $\frac{1}{4}$ **N.**, when you will have passed Ram's Head buoy and will be in ten fathoms water. The course is now **W.** by **S.** $\frac{1}{2}$ **S.** for the cliff on the northern side of Long Island Head, which will be on with the southern end of South Spectacle Island. Keep this range, on which there will be not less than six fathoms, until Deer Island Point Beacon bears **NW.** and is on with the western end of Apple Island; when Long-Island Light-house will bear **SW.** by **W.** $\frac{3}{4}$ **W.** and you will be in six and a quarter fathoms and in the Main Ship Channel. Now steer **W.** $\frac{1}{2}$ **N.** through President's Roads, and follow the directions given for that channel, on pages 10–11.

II. *From Cape Ann by night.*—Steer **SW.** $\frac{3}{4}$ **W.**, as before, until Minot's Ledge Light-house bears **SE.** by **S.** $\frac{3}{4}$ **S.**, Long Island Light-house **SW.** by **W.** $\frac{1}{2}$ **W.**, and Egg Rock Light-house **N.** by **W.**, when the depth will be fourteen and a half fathoms and the course **SW.** by **W.** $\frac{1}{4}$ **W.**, with Long Island Light-house a little open to the northward. Continue this course, carrying not less than twenty feet water, until Narrows Light-house bears **S.** $\frac{3}{4}$ **E.** and Long Island Light-house **W.** by **S.** $\frac{3}{4}$ **S.** and you are in ten fathoms. Now steer **W.** by **S.** $\frac{1}{2}$ **S.**, carrying not less than six fathoms water, and continue this course until Narrows Light-house is in range with Nix's Mate Beacon on a bearing of **SE.** $\frac{3}{4}$ **E.**, when there will be six fathoms water. (The range may not be visible, but the bearing of the light can be obtained.) Thence the course is **W.** by **N.** through President's Roads, carrying five fathoms, until the black nun-buoy on Castle Rocks is made, or the red nun-buoy on the southeastern end of The Lower Middle, when **NW.** $\frac{1}{2}$ **N.** leads up the channel to The Upper Middle; after which the directions given for the Main Ship Channel must be followed.

Or, if Deer Island Point Beacon can be seen on the **W.** by **S.** $\frac{1}{2}$ **S.** course, as soon as it bears **NW.** and Long Island Light-house **SW.** by **W.** $\frac{3}{4}$ **W.**, with six and a quarter fathoms water, steer **W.** $\frac{1}{2}$ **N.**, and follow the directions given for the Main Ship Channel.

III. *From vicinity of Salem Entrance.*—When Baker's Island Light-houses bear **NW.** by **N.** $\frac{3}{4}$ **N.**, about three miles distant, and Marblehead Light-house **WNW.**, four miles distant, with a depth of twenty fathoms, all dangers are cleared, and Egg Rock Light-house will bear **W.** by **S.** $\frac{1}{2}$ **S.**, eight miles off. The course is now **SW.** by **W.**, carrying sixteen fathoms, and Long Island Light-house will soon be made directly ahead. Steer for it until Egg Rock Light-house bears **NW.** by **N.** $\frac{3}{4}$ **N.** and Narrows Light-house **SW.** $\frac{1}{2}$ **S.**; when steer for the latter, carrying not less than ten fathoms, until Nix's Mate Beacon bears **SW.** by **W.** $\frac{1}{4}$ **W.** and is in range with the northernmost and highest of the Blue Hills. Now steer for it, keeping the range, carrying not less than twenty feet water, and follow the directions given above.

IV. *At night, from off Salem.*—Steer **SW.** by **W.**, as above, until Egg Rock Light-house bears **NW.** by **N.** $\frac{3}{4}$ **N.** and Narrows Light-house **SW.** $\frac{1}{2}$ **S.**; when there will be sixteen fathoms, and the

Sailing Direc- course will be **SW. $\frac{1}{2}$ S.** until Long Island Light-house bears **SW. by W. $\frac{3}{4}$ W.** and Egg
tions---South Rock Light-house **N. $\frac{1}{4}$ W.** There will be ten fathoms, "fine gravel," on these bearings;
Channel. and **SW. by W. $\frac{1}{4}$ W.** for Nix's Mate Beacon will lead safely in, following the directions
 given for entering by the South Channel during the night.

V. *To come alongshore past Nahant Head and enter the South Channel.*—When Egg Rock Light-house bears **W. by N.**, distant three-eighths of a mile, and you are in ten fathoms, steer **S. by W. $\frac{1}{4}$ W.** On this course you will carry not less than twelve fathoms, and, on crossing Broad Sound, the high cliff of the Great Brewster will be seen rising from behind Calf Island. Keep this range until you are within a mile and a half of the latter, in ten fathoms water, when Nix's Mate Beacon will bear **SW. by W. $\frac{1}{4}$ W.** and will be on with the highest Blue Hill, as before. From this position the directions given above must be followed.

The South Channel courses pass three-quarters of a mile to the westward of the Whistling Buoy off the Northeast Grave; three-eighths of a mile to the northward of Maffitt's Ledge; three hundred and fifty yards to the westward of Commissioner's Ledge; a quarter of a mile to the westward of The Devil's Back buoy; a little over half a mile to the eastward of Great Faun Bar buoy; a quarter of a mile to the northward of Alderidge's Ledge; a little over two hundred yards to the northward of Ram's Head buoy; half a mile to the southward of Little Faun Bar buoy; four hundred yards to the northward of Nix's Mate buoy; a quarter of a mile to the northward of Nix's Mate Beacon; and a little over a quarter of a mile to the southward of Deer Island Point Beacon.

In this channel the current of ebb, after passing Ram's Head, sets to the eastward, and care must be taken not to be carried on to Alderidge's Ledge when bound out on the ebb tide. To the northward of this ledge the current sets in the direction of the channel.

NORTH CHANNEL OF BROAD SOUND.

This channel leads across Great and Little Faun bars, and is never used except by vessels of light draught. Its entrance is just to the westward of the entrance to the South Channel, and its course about **SW. by W. $\frac{1}{4}$ W.** Vessels of lighter draught than ten feet, however, often bring Long Island Light-house to bear **SW. by W.** and run for it, which carries them safely across. Thirteen feet at mean low water can be carried across the two bars, but the channel is narrow and unsafe for strangers unless of very light draught. A shoal with ten feet lies to the eastward of Little Faun Bar buoy,* and about two hundred and fifty yards from it.

DANGERS

IN APPROACHING AND ENTERING BOSTON HARBOR BY THE NORTH CHANNEL.

The course from Cape Ann, usually steered by vessels intending to enter by the North Channel, leads a little over a mile to the northwestward of The Graves. Should the Whistling Buoy be fallen in with, however, in thick weather, it may be of use to state here that Great Faun Bar buoy bears exactly **W. $\frac{3}{4}$ S.** from it, distant three miles and a quarter, and there is nothing in the way.

In approaching this channel the first danger met with is Great Faun Bar, a long spit or bar making off from the eastern shore of Deer Island in an **E. $\frac{1}{2}$ S.** direction for nearly one mile and three-quarters. For twelve hundred yards of this length it is bare at low water,—the bare sand-spit having a general course **E. by N.**;—and its eastern end is marked by a stone beacon, called **Great Faun Bar Beacon.** To the eastward of this the shoal water continues, with depths varying from two to seventeen feet. The North Channel leads directly over this shoal in from fourteen to fifteen feet at mean low water. Great Faun Bar Beacon is placed about three hundred and fifty yards back from the extreme point of the dry spit. It is a granite cone rising from a square base, and surmounted by an iron spindle and cage, all being painted red. Vessels must not approach this beacon nearer than three-eighths of a mile,—twelve feet only being found at that distance from it. Its bearings are as follows: From

	Miles.
Nahant Head, SW. by S.-----a little over	4 $\frac{1}{8}$
Whistling Buoy off The Graves, W. $\frac{1}{4}$ S.-----" "	3 $\frac{1}{2}$
Long Island Light-house, NE. by N.-----" "	1 $\frac{1}{2}$

Two-thirds of a mile to the eastward of Great Faun Bar Beacon there is placed, in fifteen feet water, a red can-buoy of the second class, as a guide to the North Channel. This buoy, which is marked No. 2, shows the best water over the bar, and must be left to the westward, and may be passed close-to. From Long Island Light-house it bears **NE. $\frac{1}{2}$ E.**, distant one mile and three-quarters. When up with it there will be seen ahead, and nearly in range with Deer Island Point Beacon, another red can-buoy.* This is on Little Faun Bar, which makes out from the southeastern end of Deer Island

in an **E. $\frac{3}{4}$ S.** direction for a mile and a quarter to the edge of the South Channel. For three-eighths of a mile of this length (about seven hundred yards) it is dry at low tides; and about two hundred yards to the eastward of the dry bar, in fifteen feet at mean low water, is placed the buoy, which is of the second class, and marked No. 4. This buoy is a guide for the North Channel, which crosses the bar in thirteen feet; and to the eastward of it the bar has soundings varying from nine to seventeen feet. About two hundred and fifty yards **E.** from the buoy there is but ten feet, on a shoal extending **E. and W.** for three hundred yards, and which is on the eastern side of the North Channel. Little Faun Bar buoy marks the western limits of the channel, and bears from

Little Faun Bar.

Great Faun Bar buoy, SW. by W. $\frac{1}{2}$ W. -----	Miles.
Deer Island Point Beacon, NE. by E. $\frac{3}{4}$ E. -----	1 $\frac{1}{8}$
Long Island Light-house, NE. $\frac{1}{4}$ N. -----	

After passing Little Faun Bar buoy the course leads for Long Island Light-house to avoid the shoals **S.** of Little Faun Bar and Deer Island Point, the latter being marked by a granite pyramid, painted red, called Deer Island Point Beacon. The eastern shore of Deer Island must receive a berth of at least six hundred yards, and the southern point not less than seven hundred yards; for **E. by S. $\frac{1}{4}$ S.** from the beacon lies a rock, bare at low water, at the distance of an eighth of a mile, (two hundred and twenty-five yards.) To avoid this you must not go to the northward of Deer Island Point Beacon bearing **NW. by W. $\frac{1}{2}$ W.**, on with the northern point of Governor's Island.

Deer Island Point.

There are no other dangers in the North Channel.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING BOSTON HARBOR BY THE NORTH CHANNEL.

From off Cape Ann, when clear of The Londoner, steer **SW. by W.** On this course Long Island Light-house will be made directly ahead, and must be steered for until you are past The Graves and up with Great Faun Bar buoy. Pass close to this buoy, leaving it to the westward, and steer **SW. by W. $\frac{1}{2}$ W.** for Little Faun Bar buoy. When up with this buoy pass to the eastward of it, close-to, and steer **SW.** for Long Island Light-house. On this course, when Deer Island Point Beacon bears **NW. $\frac{1}{4}$ W.**, or is exactly abeam, steer **W. $\frac{1}{4}$ N.** through President's Roads, and proceed as directed for the Main Ship Channel. On the above courses the least water is eleven feet. Or, bring Long Island Light-house to bear **SW. by W.** and run for it until Deer Island Point Beacon bears **NW. by N.** and you are in seven fathoms water, with Nix's Mate Beacon bearing **SE. by S.** The course is now **W. $\frac{1}{2}$ N.** through President's Roads, following the directions given for the Main Ship Channel. Or, continue the course for Long Island Light-house until Nix's Mate Beacon is in range with Narrows Light-house on a bearing of **SE. $\frac{3}{4}$ E.**, when steer **W. $\frac{3}{4}$ N.**, and proceed as directed for the Main Ship Channel. This last channel may be run safely at night, as Long Island Light-house is steered for, and the course is altered only on a bearing of Narrows Light-house. It crosses Great Faun Bar in thirteen feet on the eastern side of the channel, and leaves the buoy about one hundred and fifty yards to the westward. It also crosses Little Faun Bar in thirteen feet on the eastern side of the ten feet shoal, and leaves the buoy a quarter of a mile to the westward. Vessels of light draught may safely run it unless there is a heavy sea.

The North Channel is never attempted by strangers; but with the above directions a stranger may, in case of necessity, run safely in to an anchorage. It is not recommended, however, to any but vessels of light draught; and to strangers only in case of urgent necessity.

SHIRLEY GUT.

This narrow and intricate passage is only fit for steamers, and must never be attempted by strangers under any circumstances. Thirteen feet at mean low water may be taken through it under the guidance of a pilot; but the channel is crooked and dangerous, with a swift current. It leads between Point Shirley and Deer Island, and is about one hundred and fifty yards wide.

DANGERS

IN APPROACHING AND ENTERING BOSTON HARBOR THROUGH SHIRLEY GUT.

The first danger met with in approaching this passage lies on the western side of the approaches and **E.** of Winthrop's Head; and when the head bears **W.**, about a mile and a quarter distant, there will be seen on the starboard bow, about twelve hundred yards distant, a red spar-buoy (No. 2). This

Winthrop's Bar. is on Winthrop's Bar, which makes off from Winthrop's Head in an **E. by S.** direction for three-quarters of a mile with not over six feet upon it at mean low water; and for eight hundred yards of this distance the bar is bare at mean low water. The buoy is placed in fifteen feet off the southeastern side of the shoal, and bears from Nahant Head **SW. $\frac{1}{4}$ S.**, about three miles and a half distant, and from the buoy on Deer Island North Point **E. by N. $\frac{3}{4}$ N.**, nearly one mile distant. It is well to give it a berth when passing so as to make a straight course for the latter buoy, as there is an *eight feet spot* between the two buoys.

When past Winthrop's Bar buoy the course leads directly for Point Shirley, (easily distinguished by the almshouse and other public buildings upon it,) and there will be seen in range with the point a black spar-buoy (No. 1). This is placed on the northern point of the shoal making off from the northern end of Deer Island and which is known as *Deer Island North Point*. The channel leads to the westward of it and makes a sudden and sharp turn around the buoy to the southward,—the current running with considerable velocity. This is the most dangerous part of the channel.

When through the Gut a red spar-buoy will be seen ahead, about half a mile off, which must be steered for to avoid the long flats making off from the western shore of Deer Island, and called Deer Island Flats. These flats have from four to six feet at mean low water, and run about **W SW.** for half a mile, almost over to the red buoy above mentioned, which must be passed close-to to avoid them. The buoy, however, is on the southeastern end of Apple Island Flats, which are dry at low water and surround Apple Island,—extending in a **SE.** direction about eleven hundred yards. At low water the flats, being quite bold-to, mark the limits of the channel with great exactness and may be passed close-to.

Deer Island Flats. The buoy, which is marked No. 6, is placed in twelve feet just clear of the shoals, and is to be left to the westward by vessels coming in, whether standing to the southward into President's Roads or turning to the westward and entering Governor's Island Channel,—the northern point of entrance to which it marks.

When abreast of the buoy on Apple Island Flats, if intending to proceed up to Boston by the Main Ship Channel, steer about **S. by W.** for the eastern end of North Spectacle Island. In steering this course the black spar-buoy on Governor's Island Flats will be left well to the westward.

Apple Island Flats. Governor's Island Flats are extensive shoals lying off the eastern shore of Governor's Island, (from which they run **E SE.** for about a mile,) and are bare at low spring tides throughout their entire length. Between these flats and Apple Island Flats runs the Governor's Island Channel, and the black spar-buoy marks the southern point of entrance to it. Between Governor's Island Flats and The Lower Middle lies the northern branch of the Main Ship Channel, called the **North Channel**, and a red spar-buoy marks its northern point of entrance. Vessels using Shirley Gut passage may pass up to Boston through either of these channels, or may continue past the red buoy on the southeastern end of The Lower Middle and go up the Main Ship Channel way.

The black buoy on Governor's Island Flats is marked No. 1, as a guide to Governor's Island Channel, and is placed in twenty feet at mean low water. If bound into President's Roads, when past this buoy you must take care not to go ashore on The Middle Ground, a mass of shoal ground lying in an **ESE.** and **WNW.** direction, between Governor's Island Flats and Deer Island Point. It is half a mile long, but there is only one part of it which is dangerous to vessels using Shirley Gut passage.

The Middle Ground. This is its western end, which is about three-eighths of a mile **SE. by S.** from the black buoy (No. 1) on Governor's Island Flats, and has seven feet at mean low water and five at lowest tides. It is marked by a red spar-buoy (No. 4) placed in twenty feet about one hundred yards to the westward of the shoal. The entrance to Governor's Island Channel leads between this and the black buoy on Governor's Island Flats, and vessels bound through Shirley Gut from the Main Ship Channel also pass between them. In coming into the Main Ship Channel from Shirley Gut vessels must pass to the *eastward* of the black and to the *westward* of the red buoy, notwithstanding their colors. The range of the eastern end of North Spectacle Island bearing **S. by W. $\frac{1}{2}$ W.** leads clear of this shoal.

There is good water on both sides of The Middle Ground, but vessels are cautioned against using the eastern passage unless of light draught, as the shoal water extends nearly over to Deer Island Flats, leaving only a very narrow channel between. Vessels of light draught using this passage should round Deer Island Point Beacon and steer **NW. by W.** for the red buoy on Apple Island Flats; but large vessels should go up into Governor's Island Channel by the western passage.

When past the black buoy on Governor's Island Flats there will be seen to the southwestward, about seven hundred yards off, a large red nun-buoy,* which is on the southeastern end of *The Lower Middle*. Now, if bound up the Main Ship Channel, steer for this buoy and pass to the eastward of it,—continuing the course to the southward until State Ledge buoy (red nun-buoy*) is in range with the red nun-buoy* on the Northwest End of The Lower Middle on a bearing of **NW. $\frac{1}{4}$ W.** Now steer that course, and proceed as directed for the Main Ship Channel.

But, if bound up the North Channel, (which is the usual passage,) round the southeastern end of Governor's Island Flats (on which there is a red spar-buoy, marked No. 2) and steer to the westward

along their southern side. On this course there will be seen ahead two red nun-buoys,*—one on each bow. The buoy to the southward is on the *Northwest End of The Lower Middle*, and that to the northward is on Governor's Island Point,—the shoal extending off from the southeastern end of Governor's Island. Its direction is **SW.** by **S. $\frac{1}{4}$ S.**, its length a quarter of a mile, and it is dry at low water for half its length. The buoy is of the third class, marked No. 12, placed in fourteen feet water off the southwestern end of the shoal, and marks the junction of this channel with the Main Ship Channel. Vessels must pass to the southward of it, and to the northward and westward of the red buoy on the Northwest End of The Lower Middle.

*Governor's
Island Point.*

When past these buoys you are in the Main Ship Channel, and must steer for the black buoy on The Upper Middle, following the directions given for that channel, on page 11. The least water in the passage is thirteen feet.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING BOSTON HARBOR THROUGH SHIRLEY GUT.

From Nahant Head (which may be passed within eight hundred yards) steer **SW.** for about four miles. This will bring you up with the red spar-buoy on Winthrop's Bar,—which must be left about four hundred and fifty yards to the westward,—and when it bears **NW.** by **N. $\frac{1}{2}$ N.** and Great Fann Bar Beacon **S. $\frac{3}{4}$ W.**, steer **W. $\frac{1}{2}$ S.** for Deer Island North Point buoy. Continue this course (on which there will be not less than sixteen feet) until you are within four hundred yards of the buoy, when alter the course to the northward so as to pass about one hundred yards to the northward of it, carrying not less than thirteen feet water. When abreast of the buoy turn short to the southward, passing to the westward of it, close-to, (carrying not less than four fathoms,) and steer **S.** by **W.** towards Deer Island for about an eighth of a mile, (two hundred and twenty-five yards,) until you are within one hundred and fifty yards of the Deer Island shore, with five fathoms water. Thence **W.** by **S. $\frac{1}{2}$ S.** must be steered for the red buoy on Apple Island Flats, which will be in range with the middle of Fort Independence, (Castle Island.) On this course there will be not less than nineteen feet water; and when up with this buoy, *if bound through Governor's Island Channel*, pass to the southward of it, and, rounding it to the westward, steer **W.** by **N. $\frac{1}{2}$ N.** (with not less than four fathoms) for the centre of Fort Winthrop,—following the directions for that channel given hereafter.

But, if bound into President's Roads and through the northern branch of the Main Ship Channel, (the North Channel,) when up with the buoy on Apple Island Flats steer **S.** by **W. $\frac{1}{2}$ W.**, passing between the black buoy on Governor's Island Flats and the red buoy on the western end of The Middle Ground. Continue this course until State Ledge buoy bears **W. $\frac{1}{4}$ S.**, when that course should be steered for about three-eighths of a mile, carrying not less than four fathoms water. When the red nun-buoy on Governor's Island Point bears **NW.** by **W. $\frac{1}{8}$ W.**, steer **NW.** by **W. $\frac{1}{2}$ W.**, which will lead you safely through the North Channel with not less than three and a half fathoms; and when the easternmost point of Governor's Island bears **N. $\frac{1}{2}$ E.**, **W. $\frac{1}{4}$ N.** will lead safely past the red buoy on Governor's Island Point and into the Main Ship Channel. At low water these courses will not be necessary, as the flats will show on each side, and it is only necessary to keep the middle of the passage to pass safely through.

Sailing vessels must not attempt the passage through Shirley Gut and thence into the harbor, as it is fit only for steamers. The sharp turn at Deer Island North Point buoy is so abrupt that great care has to be exercised even by steamers in making it; and the velocity of the tidal current, both of flood and ebb, is such as to render the passage at all times one of danger. None but those well accustomed to threading its windings ever attempt it; and the above directions are given only as a part of the description of Boston Harbor, and not as a guide to strangers.

GOVERNOR'S ISLAND CHANNEL.

This channel, which is only fit for steamers, begins at the eastern end of Governor's Island Flats, and runs in a **WNW.** direction, between Governor's Island and Apple Island, for a little over a mile and a half. Then, turning abruptly to the southward, it runs between Bird Island and Governor's Island into the Main Ship Channel, which it joins a little above The Upper Middle. It is crooked at its western end and narrow at both ends; but a steamship can carry not less than nineteen and a half feet at mean low water throughout its entire length up to the East Boston wharves. It is very well buoyed,—there being but one danger left unmarked, and that is easily avoided by careful attention to the courses and sailing-lines laid down.

DANGERS

IN APPROACHING AND ENTERING BOSTON HARBOR BY GOVERNOR'S ISLAND CHANNEL.

After passing Deer Island Point Beacon the course leads to the northwestward for the black buoy on Governor's Island Flats. The first danger encountered on this course is The Middle Ground, an extensive shoal, lying **WNW.** and **ESE.**, which occupies the very middle of the passage, dividing it into two narrow channels with nineteen and a half feet water in each,—the western channel only being buoyed. A depth of from fourteen to seventeen feet at mean low water is found over this shoal, except at its western end, where there is only seven feet. It is nearly half a mile long between the lines of three fathoms, and is marked by two red spar-buoys,—one (No. 2) on its southeastern end and the other (No. 4) on its western end.

The Middle Ground.

The black spar-buoy met with on the southwestern side of the entrance is on Governor's Island Flats,—extensive shoals lying off the eastern shore of Governor's Island, from which they extend **ESE.** for about a mile. They are bare at low spring tides throughout their entire length; and between them and the western end of The Middle Ground lies the southern entrance to the Governor's Island Channel. The buoy, which is marked No. 1, is placed in twenty feet on the northern side of the eastern point of this shoal, and vessels must pass to the northward of it. When nearly up with it a red spar-buoy will be seen about a quarter of a mile to the northward. This is on Apple Island Flats, which surround Apple Island and extend to the southeastward about eleven hundred yards. They are dry at low water nearly to the buoy (No. 6), which is placed in fourteen feet on their southeastern point,—making the northern side of the channel,—and vessels must pass to the southward of it.

Governor's Island Flats.**Apple Island Flats.**

From this point the course of the channel is **NW.** by **W. ¼ W.**, between Apple Island Flats on the north and Governor's Island Flats on the south. At low water the limits are marked as by a wall, but at other times of tide it is not so easy to keep in the best water. To do this the buoy on Apple Island Flats must be left to the northward about two hundred and seventy-five yards, and a **NW.** by **W. ¼ W.** course leads up the middle of the channel with not less than four fathoms water.

On the course up the channel, on approaching the northeastern point of Governor's Island there will be seen, on the northern side of the channel, another red spar-buoy, which is on the West Spit of Apple Island Flats. These flats, which, as before mentioned, surround Apple Island, extend to the westward from it for half a mile, and are dry at low water to within one hundred yards of the buoy. The buoy is marked No. 8, placed in eighteen feet on the southern side of the western extremity of the shoal, and may be approached quite closely. Vessels must pass to the southward of it, and there will then be seen nearly ahead, and three-eighths of a mile off, (about seven hundred yards,) a black spar-buoy. This is on the North Point of Governor's Island Flats, and is intended to mark the southern limits of the passage at this point. These flats make off from the northern side of the island for a quarter of a mile, but there are soundings of twelve, thirteen, and fourteen feet outside of them all the way to the buoy, which is in fifteen feet at mean low water between five and six hundred yards from the shore. It is marked No. 3, and is placed on the northern extremity of the shoal; and from the buoy on Apple Island Flats it bears **NW.**, seven hundred yards distant.

W. Spit of Apple Island Flats.**N. Point of Governor's Island Flats.**

Vessels must pass to the northward of buoy No. 3 to go in the best water, and an abrupt turn is then made to the westward towards the northern end of Bird Island, with a red spar-buoy on the northern side of the channel, about three hundred and fifty yards off, and a black spar-buoy on the southern side, about the same distance. The former is on Noddles Island Shoals. Noddles Island is almost entirely occupied by East Boston, and is an island of very irregular shape, lying on the southern side of Chelsea River. A large bay, full of flats with narrow sluces leading through and among them, is formed by the great curves of the shore between this island and Point Shirley; but is, however, at present of no commercial importance. These flats extend to the northern edge of the Governor's Island Channel, and it is on the southern point of one of these, making off from Noddles Island, and which is dry at ordinary low water, that the buoy is placed. It is marked No. 10 and placed in eighteen feet water on the edge of the channel.

Noddles Island Shoals.**Four Feet Shoal.**

Almost exactly midway between buoy No. 10 and the black spar-buoy on Glades Flats (to the southward) there is a shoal spot with four feet at mean low water, which is not buoyed, and is exactly in the way of vessels bound through this channel. This is the most formidable obstruction in the whole length of the passage, but is fortunately very small, and is easily avoided by keeping close to the red spar-buoy on Noddles Island Shoals or to the black buoy on Glades Flats. The latter will be seen on the eastern side of the passage, nearly in range with another of the same color some distance to the southward. The channel turns abruptly at this point and runs in a nearly **SSW.** direction.

Glades Flats, which make off from the northwestern end of Governor's Island in a **NW.** by **N.** direction for four hundred yards, are bare at low water and rocky. The buoy is marked No. 5, and is placed in four fathoms about one hundred yards **NW.** from the bare spit. It may be passed close-to, leaving it to the eastward, and the course continued passes between the red and the black buoys seen ahead. The red spar-buoy which is first met with is on the southeastern point of Bird Island Flats. Bird Island lies on the western side of this channel and is covered at high water. There will be seen an iron spindle with a cage on top, both painted red, on the southeastern point of the island, about seventy-five yards to the northward of the buoy. This is called Bird Island Beacon, and there is no passage between it and the buoy except for vessels of very light draught. The buoy marks the termination of the shoal water which makes off to the southward from the island, is marked No. 12, and is placed in two fathoms at low water. Just to the southward of it is a red spar-buoy (No. 14), which is one of the guides for the Main Ship Channel.

*Glades Flats.**Bird Island Flats.*

Give the buoy on Bird Island Flats a berth to the westward,—passing midway between it and the black spar-buoy which lies off the western end of Governor's Island, and which, when abreast of the former, will be seen a little to the eastward of the course. This buoy is on the northwestern side of Governor's Island Shoal,—the name given to the shoal ground making off from the western end of Governor's Island. It has from two to five feet at low water upon it, and extends in a westerly direction for nearly four hundred yards. The buoy (No. 7) is placed on the eastern edge of the channel, and vessels must pass to the westward of it. Here the Main Ship Channel unites with the Governor's Island Channel; and about five-eighths of a mile to the westward (twelve hundred yards) will be seen the black nun-buoy on Slate Ledge. Now follow the directions given for the Main Ship Channel, turning when abreast of the buoy on Governor's Island Shoal, and steering exactly for the State-House dome until you are well clear of the flats on the southern side of Bird Island, when haul up for the wharves on either side.

Governor's Island Shoal.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING BOSTON HARBOR BY GOVERNOR'S ISLAND CHANNEL.

1. *From the Main Ship Channel.*—This channel may be entered either through Broad Sound or from the Main Ship Channel. Coming in by the latter, continue the **NW.** course for Deer Island Point Beacon until you are past Nix's Mate and Long Island Light-house bears **WSW.**, the depth being six and a quarter fathoms,—when steer **NW.** by **W.** $\frac{2}{3}$ **W.** for the southern end of Governor's Island. On this course there will not be less than four and a half fathoms, and the two red spar-buoys marking The Middle Ground will soon be seen a little to the northward. Continue the course until the middle of Apple Island bears **N.** by **W.** $\frac{2}{3}$ **W.** and you are in five fathoms water, when the course for the island will lead safely through between The Middle Ground and Governor's Island Flats, carrying not less than nineteen and a half feet water. When abreast of the black buoy on the northern side of these flats steer **NW.** by **W.** $\frac{1}{4}$ **W.**,—having Deer Island Point Beacon directly astern and the red spar-buoy on the West Spit of Apple Island Flats nearly ahead. On this course there is nothing less than three and a half fathoms. When fairly past the buoy off Apple Island Flats steer **NW.** by **N.**, carrying not less than three and a half fathoms, until the State-House dome bears **W.** $\frac{2}{3}$ **N.** and the red spar-buoy on Noddles Island Shoals is in range with it, when steer for the dome (keeping the range) until you are past the black spar-buoy on the North Point of Governor's Island Flats and Bird Island Beacon bears **SW.** $\frac{1}{2}$ **W.** Steer for the beacon until you are abreast of the black spar-buoy on Glades Flats, when steer **SW.** by **S.** $\frac{1}{2}$ **S.** for the black buoy on Governor's Island Shoal, passing to the southeastward of the red spar-buoys on Bird Island Flats, and carrying not less than nineteen and a half feet water. When past the black buoy on Governor's Island Shoal, steer **W.** $\frac{2}{3}$ **N.** until Bunker Hill Monument bears **NW.** $\frac{2}{3}$ **N.**, when steer for it if bound to East Boston; or steer **NW.** by **W.**, and anchor on the edge of the flats off Boston.

If the tide is up a little.—Continue the course **NW.** for Deer Island Point Beacon (in range with the western end of Apple Island) until you are within two hundred and fifty yards of the former. Now steer **W.** $\frac{1}{4}$ **N.** for two hundred and fifty yards, (an eighth of a mile;) when the beacon will bear **NNE.**, the depth will be nine fathoms, and Long Island Light-house will bear **SSW.**,—the bearings changing rapidly. The course is now **NW.** $\frac{1}{4}$ **W.**, which will lead through the eastern channel, between The Middle Ground and Deer Island Flats, with not less than nineteen and a half feet, and the red spar-buoy on Apple Island Flats will soon be seen directly ahead and open to the westward of Apple Island. Follow this course, (keeping the buoy open,) carrying not less than three and a quarter fathoms,

Sailing Direc- until the red spar-buoy on the western side of The Middle Ground and the red nun-
tions--Gover- buoy on State Ledge are in range on a bearing of about **W. by S.** Now steer **NW.** by
nor's Island **W. $\frac{1}{2}$ W.** up the passage, heading for the red buoy on the West Spit of Apple Island
Channel. Flats. When abreast of it steer **NW.** by **N.**, and follow the directions for this
 channel, given above.

In this passage, if the first course in (**NW. $\frac{1}{2}$ W.** for the buoy on Apple Island Flats) can be made good, there will be at mean low water not less than nineteen feet; but in all probability a vessel will be set to the eastward or the westward by the tide and have only fifteen or sixteen feet. This channel, therefore, is not recommended to steamers of heavy draught unless the tide be up.

II. From the South Channel.—Vessels entering by this channel pass Deer Island Point Beacon as usual and bring it to bear **SE.** by **E. $\frac{1}{4}$ E.**, and steer **NW.** by **W. $\frac{1}{4}$ W.**, keeping it over the stern for a range. Continue this course until you are abreast of the northeastern end of Governor's Island and up with the red spar-buoy on the West Spit of Apple Island Flats, when steer **NW.** by **N.** and follow the directions given above.

GANGWAY PASSAGE.

This narrow channel, which is commonly known as **The Gangway**, leads along the western shore of Boston Bay from Scituate to the northward,—threading the intricate passages among the Cohasset Rocks. Although there is good water through its entire length it is used only by vessels of light draught, and by them only when piloted by an experienced pilot. No stranger should ever attempt this passage even by day; it would be impossible by night.

From Scituate to Cohasset Entrance the shore is guarded by many bare and sunken ledges lying at various distances from the land,—dangerous in the extreme, and many of them not buoyed. To thread the channels between these requires an experienced pilot, and, since Scituate light has been extinguished, few of these dare attempt the passage at night.

The shores from Scituate to Strawberry Point are of moderate height, undulating, and dotted here and there with trees; and a few houses are seen now and then. Scituate Entrance lies about four miles and a half **S.** by **E. $\frac{3}{4}$ E.** from Minot's Ledge Light-house and three miles and three-quarters **SE.** by **S. $\frac{1}{4}$ S.** from Strawberry Point. **Scituate Tower**, which is the only conspicuous object, is situated on the northern side of the entrance, but the light has been discontinued,—the tower being left as a day-mark.

It is said that the fishermen who trade to Boston in the summer maintain a light on this tower at their own expense, to enable them to come through **The Gangway** at night.

DANGERS

IN APPROACHING AND ENTERING BOSTON HARBOR BY THE GANGWAY PASSAGE.

Although no stranger should ever attempt this passage, a description of the approaches to Boston would not be complete without a mention of the numerous rocks and ledges which obstruct it. After passing Scituate Tower the shore should not be approached nearer than three-quarters of a mile to avoid **Long Ledge**, a dangerous ledge making off from the shore in a **NE. $\frac{1}{2}$ N.** direction for three-eighths of a mile, and bare at low water. It is not buoyed, but almost always shows itself by breakers. When past it the above rule must be observed until the entrance to **The Gangway** is reached, as there are several sunken ledges lying well off shore. Of these, among the most remarkable as well as the most dangerous are the **Cowen Rocks**, a mile and three-quarters above Scituate Tower, a mile and a quarter above **Long Ledge**, and three-eighths of a mile (seven hundred yards) from shore. They are a dangerous group on the edge of the three-fathom line,—being partly bare and having in places from two to six feet at mean low water. They are not buoyed, but the course usually sailed leads well to the eastward of them.

As this channel, however, leads close alongshore, it is also necessary in the highest degree to guard against the extensive and dangerous **Stellwagen Ledges**, which must be left to the eastward. They are numerous detached rocks, with from nine to eighteen feet at mean low water, extending in a chain from **Davis' Ledge** in a direction nearly **S.** to within a mile and a half of **Scituate Tower**,—a distance of nearly two miles and a half. They are all surrounded by good water, and are not buoyed, with the single exception of **Davis' Ledge**; but they break with great violence in easterly weather, and at such times should not be approached under any circumstances. **Scituate Tower** bearing **S.** clears these ledges, passing to the eastward of them; but those using **The Gangway** pass to the westward. One of the most dangerous of these rocks, which has but seven feet at lowest tides, lies five-eighths of a mile (twelve hundred yards) **NE.** of the **Cowen Rocks** and two miles **N.** by **W. $\frac{1}{4}$ W.** from **Scituate Tower**. The course leads nearly a quarter of a mile inshore of it.

Five-eighths of a mile **N.** by **W.** from Cowen Rocks and half a mile from shore lies a detached ledge, called *Sunken Ledge*, but why so called is not known, as it is bare at low water. There is from five to seven fathoms on all sides of it, and it is not buoyed; and when past it Smith's Rocks are approached. These are a group of bare rocky islets, forming the eastern end of a long line of bare and sunken ledges making off in an easterly direction from the shore just below The Glades to a distance of half a mile, and are five hundred yards to the northward of Sunken Ledge. These rocks are surrounded by shoal water, but are boldest-to on their eastern side. The easternmost rock is a small islet, called **Entrance Rock**, which is quite bold-to, and may be safely approached; and vessels in passing it leave to the eastward, a quarter of a mile off, one of the Stellwagen Ledges, *with eleven feet at mean low water*. Just to the northward of this ledge lie Colomore's Ledges, which are also part of the Stellwagen Ledges,—being a group of sunken rocks lying nearly three miles to the northward (**N.** by **W.** $\frac{1}{2}$ **W.**) of Scituate Tower, one mile **SE.** by **E.** $\frac{1}{2}$ **E.** from Strawberry Point, and a mile and three-eighths **S.** by **E.** from Minot's Ledge Light-house. They are not buoyed; and vessels using this passage pass to the westward of them and to the eastward of Osher's Rocks, which are bare at low water and lie half a mile inshore of them. These rocks lie close in with the shore of The Glades,—being only three hundred yards off, and are not generally considered in the way by vessels using this channel. There is a small passage inshore of them, but they are not buoyed. A quarter of a mile **E.** from Osher's Rocks lies a *detached rock with fifteen feet* at mean low water upon it; but the courses pass to the eastward of it.

*Smith's
Rocks.*

*Colomore's
Ledges.*

Osher's Rocks.

After passing Osher's Rocks, Chest Ledge is next met with,—a bare rock, surrounded by shoals lying one-third of a mile **SE.** by **E.** $\frac{1}{2}$ **E.** from Strawberry Point, one mile **S.** by **W.** $\frac{1}{2}$ **W.** from Minot's Ledge Light-house, and nearly three-quarters of a mile to the northward of Smith's Rocks. Though surrounded by shoals, there is a passage with twenty-two feet at low water between it and the shore, which is not, however, available except in the smoothest weather.

Chest Ledge.

Chest Ledge is not buoyed, but the courses pass to the eastward of it. About five hundred yards **E.** $\frac{3}{4}$ **N.** from it lies a detached pinnacle rock, called Mike's Ledge, and the channel leads between them. Mike's Ledge has six feet at mean low water, lies three-eighths of a mile **N.** by **W.** $\frac{1}{2}$ **W.** from Colomore's Ledges and one mile **S.** $\frac{1}{2}$ **E.** from Minot's Ledge Light-house, and the courses pass an eighth of a mile to the westward of it.

Mike's Ledge.

Tobias' Rock is the next obstruction met with after passing Chest Ledge, and is the southernmost of the group known as *Cohasset Rocks*. It is three hundred and fifty yards above Chest Ledge and a quarter of a mile **E.** of Strawberry Point. It is a bold bare rock, always out, and may be approached quite closely, but the sailing-lines pass to the eastward of it. When abreast of it there will be seen a bare rocky islet to the westward, lying about three hundred yards **N.** of Strawberry Point, called **Gull Island**. The channel leads between this and a dangerous ledge about five hundred yards to the eastward of it, called the **West Willies**. These, which are also a part of the *Cohasset Rocks*, are bare at low water, and lie a quarter of a mile to the northward of Tobias' Rock and five-eighths of a mile (twelve hundred yards) **SSW.** from Minot's Ledge Light-house,—forming a piece of shoal ground about an eighth of a mile square on the eastern side of the channel. A black spar-buoy (No. 1) is placed on the northwestern side of the shoal, and vessels going into Boston through this channel must pass to the *westward* of it notwithstanding its color, as it is painted and numbered for a channel leading from the eastward into Cohasset. This buoy is the first one met with by vessels bound to the northward through The Gangway.

Tobias' Rock.

West Willies.

The **East Willies** lies about four hundred yards to the eastward of the dry rock on West Willies and three-quarters of a mile **S.** $\frac{1}{8}$ **W.** from Minot's Ledge Light-house. It is bare at low water and is not buoyed; and a passage with six fathoms leads between the two ledges.

East Willies.

When up with West Willies the course passes to the eastward of Gull Island and a line of ledges to the northward of it, some of which are always out. A quarter of a mile to the westward of these lies Sheppard's Ledge, bare at low water, and marking the southern side of the entrance to Cohasset Harbor. A black spar-buoy (No. 3) is placed on its northwestern side, off what is known as *Jacques Rock*; but there is no passage between it and Gull Island, nor between Gull Island and Strawberry Point.

*Sheppard's
Ledge.*

When past Gull Island the entrance to Cohasset opens to the westward, and to the eastward will be seen a red spar-buoy. This is on the southern side of Enos' Ledge, which is not in the Gangway Passage, but on the northern side of the eastern entrance to Cohasset, which leads between this ledge and the West Willies. It is a large ledge, lying nearly **E.** and **W.**, and dry at low water; and from Minot's Ledge Light-house it bears **SW.** $\frac{1}{4}$ **S.**, three-eighths of a mile distant. The buoy is placed on the southern side of the ledge, and must not be approached by vessels using The Gangway; for about three hundred and fifty yards to the westward

Enos' Ledge.

East Shag Ledge. of it lies a bare rock, surrounded by shoal water, known as East Shag Ledge. This ledge lies on the eastern side of The Gangway, half a mile **SW.** $\frac{1}{2}$ **W.** from Minot's Ledge Light-house, and must receive a berth of one hundred and fifty yards. It is not buoyed,—the bare rocks serving as a guide; and when abreast of it two spar-buoys will be seen ahead. The black buoy is on the western point of West Hogshead Rock, dry at low water, and lying **W.** $\frac{1}{4}$ **S.** from Minot's Ledge Light-house, a little over half a mile distant.

West Hogshead Rock. An eighth of a mile to the eastward of it is another rock, bare at low water, called *Hogshead Rock*; but both form one large ledge, lying **E.** and **W.**, and about three hundred and fifty yards long. The same distance still farther to the eastward lies another rock, bare at low water, called *East Hogshead Rock*, and surrounded by deep water. The buoy is a black spar (No. 1), and is placed in sixteen feet on the western edge of the ledge,—marking the eastern limits of the Main Channel into Cohasset. Vessels bound to Boston through The Gangway must pass to the westward of it.

On approaching the buoy on West Hogshead Rock a large bare rock, called West Shag, will be left to the westward; and from the buoy this rock bears **NE.** by **E.** $\frac{1}{4}$ **E.**, six hundred yards distant. West Shag is shoal in its approaches, and bare at low water on its western side for nearly four hundred yards; but on its eastern side it is pretty bold-to.

The red spar-buoy which will be seen to the westward on coming up with West Hogshead Rock is on the western side of the northern entrance to The Gangway, and marks the point where it joins the main approach as well as the Main Channel into Cohasset. It is on the northeastern end of The

The Grampuses. West Shag, and about three-eighths of a mile (six hundred and fifty yards) to the westward of West Hogshead Rock buoy. There is a depth of six feet between the two ledges. The buoy is marked No. 2, but vessels bound to Boston through The Gangway pass to the eastward of it, as it is painted and numbered for Cohasset Entrance. From Minot's Ledge Light-house it bears **W.**, seven-eighths of a mile; from the Glades House **N.** $\frac{3}{4}$ **W.**; and from the buoy on West Hogshead Rock **W.** by **N.**, a little over a quarter of a mile distant.

The Grampuses form the northern extremity of an extensive line of ledges extending in a **N NE.** and **S SW.** direction up the middle of Cohasset Harbor,—separating the approach into two channels. That to the eastward is called the **Main Channel**, and the western passage is known as **Brush Island Channel**.

When past the red buoy on The Grampuses the channel is clear to Harding's Ledge.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING BOSTON HARBOR BY THE GANGWAY PASSAGE.

Vessels using this passage pass half a mile to the eastward of Scituate Tower,—steering **N NW.** for Minot's Ledge Light-house. This course will lead past Long Ledge in not less than four and a half fathoms. When the tower bears **S.**, one and a third miles distant, steer **NW.** $\frac{1}{4}$ **W.** for about a mile, carrying not less than six and a half fathoms, until Minot's Ledge Light-house bears **N.** $\frac{1}{2}$ **W.** and Scituate Tower **S.** by **E.** $\frac{1}{2}$ **E.**; when the depth will be seven fathoms, and **N.** by **W.** $\frac{1}{2}$ **W.** will lead safely through the passage, passing to the eastward of Entrance Rock, to the westward of Colomore's Ledges, to the eastward of Chest Ledge, and to the westward of Mike's Ledge. When between the two latter, in six and a half fathoms, with Minot's Ledge Light-house bearing **N.** $\frac{1}{4}$ **E.**, one mile distant, and the middle of Gull Island **NW.** $\frac{3}{4}$ **W.**, five-eighths of a mile distant, steer **NW.** $\frac{1}{2}$ **N.**, which will lead, with not less than four and a half fathoms, past Gull Island and West Shag, and nearly up with the red buoy on The Grampuses, carrying not less than three fathoms at low water. Vessels must pass to the eastward of the buoy on The Grampuses and steer **NW.** $\frac{1}{2}$ **N.** for the bell-buoy on Harding's Ledge, carrying not less than seven and a half fathoms. When up with the bell-buoy, **NW.** by **W.** will lead into the Main Ship Channel with not less than four and a half fathoms. On this latter course, when Boston Light-house bears **N.** $\frac{1}{2}$ **W.**, steer **W.** for the southern extremity of George's Island, and follow the directions given for the Main Ship Channel, on pages 10–11. Or, when up with the red buoy on The Grampuses, as before, steer **NW.** $\frac{1}{2}$ **W.** for the eastern cliff of Point Allerton. This course leads, with not less than four fathoms, half a mile inshore of the westernmost rock of Harding's Ledge, and when the beacon bears **E.** $\frac{1}{4}$ **N.**: and Boston Light-house **NW.** by **N.** $\frac{1}{2}$ **N.**, with four fathoms, "stony bottom," steer for the latter until Narrows Light-house bears **W.** by **N.** $\frac{1}{4}$ **N.** Now steer **W.** by **N.** for the black buoy on the northern end of Centurion Rocks, carrying not less than three and a half fathoms. Pass to the northward of this buoy and steer **NW.** $\frac{1}{2}$ **W.**, following the directions given for the Main Ship Channel.

The above courses pass nearly six hundred yards to the eastward of Cowen Rocks; *Sailing Directions--Gangway Passage.* four hundred yards to the eastward of Sunken Ledge; a quarter of a mile to the westward of the nine feet rock on Stellwagen Ledges; two hundred yards to the eastward of Entrance Rock; an eighth of a mile to the westward of Colomore's Ledges; three hundred and fifty yards to the eastward of the dry part of Chest Ledge; two hundred yards to the westward of Mike's Ledge; an eighth of a mile to the eastward of Tobias' Rock; two hundred yards to the westward of the bare rock of West Willies; two hundred yards to the eastward of Sheppard's Ledge; two hundred yards to the westward of the bare rock on East Shag; an eighth of a mile to the eastward of West Shag; three hundred yards to the westward of the black buoy on West Hog-head Rock; and about fifty yards to the eastward of The Grampuses. They pass half a mile inshore of Harding's Ledge Beacon and three hundred yards to the northeastward of the black buoy on Point Allerton Bar.

This passage, as before remarked, must never be attempted by strangers; but it is of great convenience, however, to the fishermen and light coasters, who are familiar with its dangers.

BLACK ROCK CHANNEL.

This is a narrow channel which leads from the Main Ship Channel in a **NE.** direction, between Lovell's Island and Narrows Light-house, into Hypocrite Channel. It is dangerous, and is never used by large vessels unless there is ice in The Narrows. The southeastern side of this passage is marked by Spit Bar; the northwestern side by the shoals on the eastern side of Lovell's Island; and strangers must not attempt it.

DANGERS

IN THE BLACK ROCK CHANNEL OUT OF BOSTON HARBOR.

In leaving the Main Ship Channel and bound out by the Black Rock Channel, the first danger met with is Whiting's Ledge, which has about six feet at lowest tides, and lies nearly in the middle of the passage, with the ebb tide setting strongly over it. It is not buoyed; but the following bearings were taken upon it: Narrows Light-house (with False Spit Beacon just open to the eastward) **SE.** by **S.** $\frac{3}{4}$ **S.**, an eighth of a mile distant; and Black Rock **E.** by **N.**, a little over six hundred yards distant. To avoid it keep the eastern side of the passage aboard; and in doing so care must be taken not to go ashore on Spit or Brewster Bar, (see also page 7.) This long spit makes off from the Great Brewster in a westerly direction to Narrows Light-house,—a distance of nearly one mile. It is dry at low water and tolerably bold-to, and is not very dangerous to vessels using this channel unless they hug the eastern side too closely while endeavoring to avoid Whiting's Ledge. On the northern edge of this spit, about five hundred yards **NE.** $\frac{3}{4}$ **E.** from Narrows Light-house, lies a prominent rock or islet, called **Black Rock**, which gives the name to the channel and serves also as a guide to keep vessels off the spit.

Whiting's Ledge.

Spit or Brewster Bar.

From the eastern side of Lovell's Island shoal water extends to the northeastward for three-quarters of a mile,—there being only twelve feet at low water at that distance from the island. The spit is bare at low water for an eighth of a mile **NE.** of the southern end of the island, and there is less than six feet a third of a mile to the eastward of the eastern shore. The ebb tide sets on to these shoals, and vessels bound out must be careful, after passing Whiting's Ledge, not to go to the westward of Green Island bearing **NE.** The northeastern point of Lovell's Island and about two-thirds of a mile **E.** by **N.** $\frac{1}{2}$ **N.** from the northeastern point of Calf Island.

Shoals East of Lovell's Island.

The western shore of Calf Island is bold-to and may be approached quite closely.

SAILING DIRECTIONS

FOR THE BLACK ROCK CHANNEL OUT OF BOSTON HARBOR.

Coming down the Main Ship Channel on the **SE.** $\frac{1}{2}$ **E.** course, when about midway between the southeastern end of Lovell's Island and Narrows Light-house, with the southeastern angle of Fort Warren bearing **SW.**, steer **NE.**, (keeping that range,) with Green Island a very little to the northward of the course. This clears Whiting's Ledge, and should be continued until Little Calf Island bears **S.** by **E.**, three hundred yards off, when the vessel will be in the Hypocrite Channel, about five hundred yards **SW.** from Green Island, and should steer **E.** or **E.** $\frac{1}{2}$ **S.**, which will lead clear of everything. Not less than four fathoms is found on these courses.

Sailing Directions--Black Rock Channel. If the tide be flood, mariners must not depend upon the **NE.** course to lead clear of Whiting's Ledge. The course made good leads within thirty yards of that ledge, towards which the flood tide sets. In such a case, keep the eastern side of the channel aboard (guiding the courses by Black Rock) until past the ledge, when haul up for Green Island and proceed as before directed. This channel is, however, seldom used except on the ebb tide.

Both flood and ebb tides set strongly through this channel,—the former setting nearly in the direction of the channel and the latter more towards the eastern side. In either case, however, care must be taken not to be set on to Whiting's Ledge. A good rule is to pass close to Narrows Light-house and steer to the northeastward, keeping Black Rock open to the eastward; but no stranger ought to attempt this passage, as a pilot can always be obtained in Boston.

BACK OR WESTERN WAY.

This channel is used on the ebb, in light winds, to avoid being set out into the Sound at Nix's Mate, or into Black Rock Channel at the southeastern end of Lovell's Island. The entrance is between Thompson's Island and The Spectacles, whence it passes between the southwestern end of Long Island and Moon Head; then, turning abruptly to the northeastward, passes along the eastern shore of Long Island, between it and Rainsford's Island; and thence towards George's Island into Inner Nantasket Roads. With care, this channel is safe even for strangers.

When abreast of the black buoy on Castle Rocks the entrance will bear **S SE.**; and a little to the westward of this bearing will be seen the precipitous face of Thompson's Island, which lies on the western side of the entrance to the Back Way and on the eastern side of the entrance to Neponset River. This island lies **ENE.** and **WSW.**, is a mile long, and the group of large houses on its summit is the **Farm School**, built near the middle of the island, where the land rises to a height of seventy-five feet,—nearly all the rest of the island being low land. It is surrounded by flats and shoals, which, on its eastern side, extend off to a distance of three-quarters of a mile with less than six feet at low water; but on its western side it is much bolder, and may be approached (if bound into Neponset River) within three hundred and fifty yards.

To the southward of Thompson's Island lies the peninsula of **Squantum**; and from the southeastern end of the former a long and narrow sand-spit extends nearly **S.** by **E.** for five hundred yards,—its southern end being within seventy-five yards of Squantum. Thus the island is nearly joined to the mainland and there is no passage between them at low water.

On the eastern side of the entrance will be seen the Spectacle Islands, or **The Spectacles**, which will be nearly in range from this point of view. They are two islands of moderate height, bare of trees, lying **N.** and **S.** from each other, and joined at low water by a dry bar. The northern island lies nearly **E.** and **W.**, and is seven hundred yards long and sixty-five feet high, with cliff-like faces worn by the action of the water. On coming up with it there will be seen a group of houses on its southern end, where there is a low sand point. The southern island, on approaching it, will be seen to be equally bare with the North Spectacle, but not so steep, although its height at the summit is the same. The northern face of this island is as precipitous as that of the North Spectacle, but this side is not visible from the Back Way; and on the southern side the shore is low and sandy. Here there is a wharf making out to the edge of the channel from the western shore of the South Spectacle near its southern end.

When past The Spectacles, on the **S SE.** course, Moon Island will appear on the western side of the channel and Long Island on the eastern side. Moon Island cannot fail to be recognized by reason of its high, bare, precipitous head, called **Moon Head**, which forms its eastern end. Viewed from near The Spectacles it will look like an extension of the eastern face of Squantum. Moon Island lies **E.** by **N.** and **W.** by **S.** and is three-quarters of a mile long. The head, which is eighty-five feet high, forms the principal part of the island; as to the westward of its base there is nothing but a low sand-spit extending about **W.** over a third of a mile. At low water this is joined to the peninsula of Squantum, whose rugged hills appear to the westward of Moon Island.

Opposite to Moon Head appears, on the eastern side of the channel, the southwestern extremity of Long Island, presenting a bare hill fifty feet high, with precipitous face. To the northward of this hill the surface slopes regularly almost to sea-level; rises again to a height of twenty or thirty feet; then falls again, and so continues, presenting a series of elevations and depressions,—the hills varying from fifty to ninety feet in height. The highest land on the island is about midway between its northern and southern ends, where a smooth green hill rises to a height of ninety feet. On the northern slopes of this hill will be seen,—on passing to the southward of Spectacle Islands,—the hotel buildings; and here is a large wharf, used as a steamboat landing during the summer season. Still farther to the northward rises **Long Island Head**, eighty feet high, with the light-house on its summit. It will appear like a separate island,—the land between it and the base of the hill upon which the hotel is built being so low as to be scarcely perceptible.

The channel passing between Moon Head and Long Island leads directly towards a bare precipitous head with water-worn face, behind which rises a still higher hill, smooth and grassy, but not so steep. The high hill is **Quincy Great Hill**, and the smaller head in range with it is **Nut Island**. The latter, sixty feet high, is two miles to the southeastward of Moon Head, and lies on the eastern side of Quincy Bay.

To the southward and a little to the westward of Nut Island, and about three-quarters of a mile off, will appear a low, bare, rocky islet. This is Hangman's Island, which lies in the middle of the entrance to Quincy Bay, about midway between Moon Island and Nut Island, and is surrounded by shoals. To the northeastward of this island and in range with the western end of Peddock's Island will appear a large beacon of open-work, with a granite base, and surmounted by a staff and cage. This is **Sunken Island Beacon**, on **Sunken Island**, and is one of the guides to the approaches to Weymouth Fore River. Neither this ledge nor Hangman's Island is in the way of vessels bound out by the Back Way.

**Hangman's
Island.**

When well past the southwestern end of Long Island the channel turns abruptly to the northeastward along the eastern face of that island, between it and Rainsford's Island. This will appear as a low island nearly bare of trees, but having several groups of buildings upon it and a long wharf making off from its southern end. The buildings belong to the **Quarantine Station**, which was formerly established upon this island, and are partially concealed by trees planted around them for ornament and shade. To the southward of the western end of the island a long ledge of bare rocks will be seen extending in a southerly direction a considerable distance. These are the **Quarantine Rocks**, and are among the principal obstructions to the entrance to Weymouth.

**Rainsford's
Island.**

The course to the northeastward leads directly towards the western end of **Gallup's Island**, which from this point of view will show as low, gently sloping land, with a couple of houses close to the shore and two small wharves making out to the southward and westward. Nix's Mate Beacon will appear a little to the northward of the course, and Long Island Light-house still farther to the westward.

When past the eastern end of Rainsford's Island the channel turns to the eastward,—the course leading directly for the southern angle of Fort Warren on George's Island until within three-eighths of a mile of it, when it turns to the southward, leading directly towards a high bare hill, called **Nantasket Hill**,—on the western slopes of which will be seen the village of **Hull**. This course leads into Nantasket Roads, after which the directions for the Main Ship Channel must be followed.

DANGERS

IN THE BACK OR WESTERN WAY OUT OF BOSTON HARBOR.

Scant nine feet at mean low water is all that can be taken through this channel,—the shoalest part being to the southward of Spectacle Islands, between them and Moon Head. The first obstruction met with, after passing the black buoy on Castle Rocks, is known as Thompson's Island Flats, which extend off from the northeastern end of Thompson's Island to the eastward for nearly three-eighths of a mile with less than six feet at mean low water, and that depth is found at a distance of three-quarters of a mile from the southern end of the island. They are not buoyed, and to avoid them the Spectacle Island shore must be kept best aboard. Vessels must be careful not to approach the Thompson's Island shore.

**Thompson's
Island Flats.**

When abreast of the southern end of Spectacle Islands there will be seen well to the eastward of the course, and about half a mile off, a red spar-buoy. This is on the eastern end of Sculpin Ledge, a long reef with many rocks awash, lying on the eastern side of the channel, about midway between Long Island and Spectacle Islands. The buoy is no guide for the Back Way, being placed as a guide to **Sculpin Ledge Channel**,—as the passage between Long Island and The Spectacles is called. Sculpin Ledge lies **WNW.** and **ESE.**, is nearly three hundred yards long, and its western end bears **SE.** by **S.** from the wharf on the South Spectacle, six hundred yards distant. There is no buoy on this end of the ledge, and to avoid it vessels must not go to the eastward of the line joining the southwestern end of Long Island and the wharf on the South Spectacle.

Sculpin Ledge.

From Moon Head to the eastward a flat extends about an eighth of a mile with less than six feet water. It is called **Moon Head Flats**, and is not buoyed, but the sailing-lines lead well clear of it.

The next danger met with is known as Quarantine Rocks, which extend in a **S.** by **W.** direction from the western end of Rainsford's Island for three-eighths of a mile, are mostly bare at low water, and not marked in any way. They are, however, not dangerous to vessels using the Back Way unless beating to windward, in which case, to avoid them, keep Long Island Light-house open to the westward of Rainsford's Island.

**Quarantine
Rocks.**

When past Rainsford's Island and steering towards Fort Warren there will be seen, on the southern side of the channel, a black nun-buoy.* This is on Hospital Shoal, an extensive ledge, lying in a **WNW.** and **ESE.** direction, between Rainsford's and George's islands. It is three-eighths of a mile long, and has upon it a small rock, with five feet at low water, called **Wilson's Rock**. The western end of the shoal bears from the western end of Rainsford's Island **ENE.** and from Long Island Light-house **S.** by **E.** $\frac{1}{2}$ **E.** The buoy is of the third class, placed in eighteen feet off the eastern end of the shoal, and bears from the southern end of George's Island **W.**, half a mile, and from Long Island Light-house **SE.** by **S.** $\frac{1}{2}$ **S.**, one mile and an eighth distant.

Hospital Shoal.

After passing the buoy on Hospital Shoal you will enter Nantasket Roads, and the course must be shaped either for the southern Centurion buoy or to pass between Toddy Rocks and Hunt's Ledge.

In the former case, steer **E NE.** for a red nun-buoy,* with a black nun-buoy* a short distance to the northward of it. The red buoy is on the southeastern end of Centurion Rocks, or *The Centurion*, (which have fourteen feet at mean low tides and twelve at low springs,) and bears from Narrows Light-house **SE. $\frac{3}{4}$ S.**, three-eighths of a mile, and from Boston Light-house **W. by S. $\frac{3}{4}$ S.**, one mile and an eighth distant. Vessels using this channel pass to the southward of the buoy close-to.

On passing the red buoy on The Centurion a nun-buoy,* painted red and black in horizontal stripes, is left to the southward a quarter of a mile off. This is on Hunt's Ledge, which lies on the southern side of the channel, about half a mile from the Nantasket shore, has fourteen feet at mean low water and from three to five fathoms on all sides. The buoy is on the rock.

When past The Centurion buoy the course leads to the eastward, passing to the southward of a red spar-buoy. This is on Nash's Rock, a detached rock with thirteen feet at low water, lying in the middle of the channel. The buoy is placed in eighteen feet water on the southern side of the rock. It is intended to remove Nash's Rock by blasting to a depth of twenty-one feet at mean low water.

After passing Boston Light-house the channel is clear to sea.

If intending to pass between Toddy Rocks and Hunt's Ledge, the course will be about **E.**, and there will be seen about three-quarters of a mile to the eastward a black nun-buoy* on the southern side of the passage and a red and black nun-buoy* on the northern side. The latter is on Hunt's Ledge; the former on the northern end of Toddy Rocks. These rocks make off in a long line from the base of the Nantasket Hills and are bare at low water one-eighth of a mile from shore. The buoy on Toddy Rocks is a nun* of the second class, marked No. 1, and placed in three and a half fathoms on the northern side of the ledge. The channel leads directly between this buoy and that on Hunt's Ledge, and continues to the eastward towards Point Allerton, passing to the northward of the black nun-buoy on Point Allerton Bar. After passing this buoy there are no more obstructions and the channel is clear to sea.

SAILING DIRECTIONS

FOR THE BACK OR WESTERN WAY OUT OF BOSTON HARBOR.

From abreast of the black buoy on Castle Rocks steer **S SE.** for Quincy Great Hill, which will appear about four miles off. This course will lead, with not less than nine feet, between Thompson's Island and The Spectacles, passing to the eastward of Thompson's Island Flats and well to the westward of Sculpin Ledge. (It may be possible to see Nut Island in range with Quincy Great Hill and to recognize it by its bare precipitous head.) On this course, when Bass Point (the southeastern end of Long Island) is opened from behind the southwestern point on a bearing of **NE.** by **E. $\frac{3}{4}$ E.**, steer **SE.** for a quarter of a mile exactly for the summit of the hill on the southwestern end of Peddock's Island. On this course there will not be less than nineteen feet; and when the southwestern end of Long Island bears **N. $\frac{1}{2}$ W.** and is in range with the eastern end of the North Spectacle, steer **NE.** by **E.** for the western end of Gallup's Island, passing between Rainsford's and Long islands and carrying four fathoms water. Continue this course until Long Island Light-house bears **N.** and the eastern end of Rainsford's Island is a little abaft the beam, bearing **S.** by **E. $\frac{1}{2}$ E.**, when there will be three and three-quarter fathoms, and **E.** by **S.** must be steered for the southern angle of Fort Warren on George's Island. On this course the least water is three and a half fathoms. When within five hundred yards of the island, with the centre of Nantasket Hill bearing **SE. $\frac{1}{2}$ E.**, steer for the hill until Narrows Light-house bears **N NE.**, when the depth will be seven and a half fathoms, and **E NE.** will lead you up to the southeastern buoy on The Centurion. When up with this buoy steer **E. $\frac{1}{2}$ N.** to sea.

Or, on the **SE. $\frac{1}{2}$ E.** course for Nantasket Hill, when Narrows Light-house bears **N NE.** and it is intended to pass between Toddy Rocks and Hunt's Ledge, steer **E.**, passing about midway between the two buoys in five and three-quarter fathoms. This course continued will carry you safely to sea.

PASSAGE BETWEEN LONG ISLAND HEAD AND NIX'S MATE.

There is a deep and unobstructed passage with not less than five fathoms leading between George's Island and Gallup's Island, and vessels passing up The Narrows on the flood-tide may, if the wind be light, be set through this passage. In such a case they will find good anchorage anywhere to the southward of Gallup's Island or to the westward of George's Island. If such a vessel be of light draught, she may avail herself of a channel with ten feet at mean low water which leads to the northward, between Nix's Mate and Long Island Head, into the Main Ship Channel.

DANGERS

IN THE PASSAGE BETWEEN LONG ISLAND HEAD AND NIX'S MATE.

Designing to enter this channel from Nantasket Roads, the course leads towards the low land to the southward of Long Island Head, passing to the eastward of a black nun-buoy* marked No. 1. This is on Hospital Shoal, a large ledge lying **W NW.** and **E SE.** between Rainsford's Island and George's Island,—*Wilson's Rock*, the shoalest part of it, having five feet at mean low water. The buoy is placed on the eastern side of the shoal and is half a mile **W.** of *Hospital Shoal*, the southern angle of Fort Warren. When past it there are no dangers until you are near the western end of Gallup's Island, when there will appear, a little to the northward of the course, a red spar-buoy. This is on the *South Spit of Nix's Mate*, which is dry at low water, and extends from Nix's Mate Beacon in a **SE.** direction for a quarter of a mile to the buoy, which is marked No. 2. In passing the shoal the buoy is left to the eastward close-to, to avoid the shoals on the Long Island side.

SAILING DIRECTIONS

FOR THE PASSAGE BETWEEN LONG ISLAND HEAD AND NIX'S MATE.

From the buoy on the southeastern end of The Centurion steer **W SW.** until Narrows Light-house bears **N NE.**, when steer **NW.** $\frac{1}{2}$ **W.** for the low land just to the southward of Long Island Head. On this course Nantasket Hill will be directly astern. Continue it until you are past George's Island, carrying not less than three and a half fathoms, and Deer Island Point Beacon bears **N.** by **W.** Now steer for the beacon, passing to the westward of the red buoy on the South Spit of Nix's Mate; and when fairly in the Main Ship Channel, with Long Island Light-house bearing **SW.** $\frac{1}{4}$ **S.**, steer **W.** $\frac{1}{2}$ **N.** into President's Roads. Ten feet is the least water, and this is found between Nix's Mate and Long Island Head; but everywhere else there is over three fathoms.

SCULPIN LEDGE CHANNEL.

This channel, which leads from President's Roads into the Back or Western Way, is commonly used by vessels bound to Quincy and Weymouth, and is good for eleven feet at mean low water. The channel lies nearest to Long Island,—extensive shoals making off from the eastern shore of The Spectacles.

DANGERS

IN THE SCULPIN LEDGE CHANNEL—BOSTON HARBOR.

In coming into this channel from President's Roads, when abreast of Long Island Light-house there will be seen to the eastward of the course a black spar-buoy lying close in with the wharf near the hotel. This is on Wharf Rock, which lies to the westward of the *Wharf Rock*. The buoy has two feet at lowest tides. The buoy is marked No. 1, placed on the northwestern side of the rock in ten feet water, and vessels must pass to the westward of it. When past it, a red spar-buoy will be seen ahead about half a mile off. This is on Sculpin Ledge, an obstruction already described in the dangers in the Back Way as a long reef, *Sculpin Ledge*. awash in several places at low water, lying about midway between Long Island and The Spectacles and on the western side of this channel. The buoy is marked No. 2, placed in twelve feet water off the eastern end of the shoal, and vessels must pass to the eastward of it.

SAILING DIRECTIONS

FOR THE SCULPIN LEDGE CHANNEL—BOSTON HARBOR.

I. *Coming from the Eastward.*—When Long Island Light-house bears **SE.** $\frac{3}{4}$ **S.** and Deer Island Point Beacon **E.** by **N.** $\frac{3}{4}$ **N.**, steer **SW.** by **S.**, carrying not less than three fathoms, until you are up with the red buoy on Sculpin Ledge, which must be left to the westward about fifty yards off, and **SW.** by **W.** $\frac{1}{4}$ **W.** must be steered for the summit of Moon Head. On this course there will not be less than fourteen feet, and when you are within one-third of a mile (about six hundred and fifty yards) of Moon Head, with Quincy Great Hill bearing **S SE.** and the wharf on the southwestern point of The Spectacles **N.** by **W.**, you will have entered the Back Way, and must steer **S SE.** or **N NW.**, according as you are bound to Quincy or into the Neponset River. On this course there will not be less than eleven feet.

II. *Coming from the Westward.*—When, on the course through President's Roads, Long Island Light-house bears **E SE.** and the eastern end of the North Spectacle **S.** by **W.**, steer **SE.** for the wharf near the hotel on the western side of Long Island. Continue this course, carrying not less than three fathoms, until you are within three hundred and fifty yards of the wharf, when steer **SW.** by **S.** for the red buoy on Sculpin Ledge and proceed as above directed.

FORT HILL CHANNEL.

This channel, which separates South Boston from Boston proper and leads into South Bay, has eight feet at mean low water. Its shores are lined with wharves and it is crossed by no less than five draw-bridges; and vessels therefore must be towed in and out. The Harbor Commissioners design making extensive improvements in this channel,—one of the most important of which is a heavy granite sea-wall.

GENERAL REMARKS

ON THE APPROACHES TO BOSTON HARBOR.

In the entrance to Massachusetts Bay, and exactly in line between Cape Ann and Cape Cod, lies Stellwagen's Bank, about sixteen miles and a half long, with a depth of from nine and a half to twenty fathoms. The bank lies almost exactly N. and S.,—its northern end being a little over sixteen miles to the southward of Thatcher's Island Light-houses and its southern end five miles to the northward of Race Point. At its southwestern extremity, which is a little over twenty-seven miles to the southeastward of Boston Light-house, is a spot with nine and a half fathoms,—the shoalest part of the bank; but the general depth over its area is from twelve to fifteen fathoms. Striking the northern part of this bank, in coming from the eastward, you will shoal your ground rapidly from thirty to nineteen fathoms, when Boston Light-house will bear W. $\frac{1}{8}$ S. and will be distant a little over twenty-two miles. Crossing the middle of the bank on a WNW. course, you will have from fourteen to sixteen fathoms, "coarse sand and black specks;" and here the bank is a little over four miles wide. But in coming from the southward and crossing the southwestern end of the bank the soundings will decrease rapidly from twenty-five to twelve fathoms, "fine sand;" and you will get ten fathoms before leaving the bank,—Boston Light-house bearing NW. by W. $\frac{1}{4}$ W., distant twenty-seven miles.

The bank is not specially prominent as a landmark, but is noted as a good fishing ground.

NEPONSET RIVER.

From Dorchester Point, the eastern point of the peninsula of South Boston, the shore of Boston Harbor runs to the westward a mile and a quarter, then turns to the southward for nearly half a mile, and then to the eastward into a long marshy point, called Old Harbor Point,—thus forming a large but shallow cove, dry at low water, called Old Harbor. A small cove, also dry at low water, makes in on the southern side of Old Harbor Point, between it and a steep partly wooded hill, one hundred feet high, called Savin Hill. The shore extends to the eastward from the base of this hill into a long narrow sand point, called Savin Point.

On the southern side of Savin Hill another large cove makes in,—the shores of which are thickly settled. It is dry at low water and is crossed near its head by a bridge,—over which passes the Old Colony Railroad. The southern point of the entrance to this cove is a flat peninsula, called Commercial Point, composed of low cleared land, thickly covered with houses; and from its southeastern point a large wharf, called Commercial Wharf, extends off to the eastward. This peninsula forms the western point of entrance to Neponset River.

Neponset River is the first river emptying into Boston Harbor to the eastward of South Boston, and leads to Neponset Village, one mile above its mouth, and thence to Milton Mills, two miles farther by the river. It is narrow and crooked, the approaches are dangerous, and it is not considered safe for strangers to enter without a pilot. Some description of its shores and obstructions will be given, however, and such sailing directions as can be made intelligible. The river is a third of a mile wide at its mouth, but grows gradually narrower until, at Milton Mills, it is only one hundred yards in width. The western side of the entrance is thickly settled, and is marked by a long wharf, with many buildings upon it, called Commercial Wharf, which extends out to the edge of the channel. The eastern shores of the river are composed almost entirely of salt-meadow and are destitute of houses.

In entering the river vessels pass between The Spectacles and Castle Island,—keeping along the western shore of Thompson's Island and steering nearly for Commercial Point. When past Thompson's Island the thickly settled country between Mount Bowdoin and Neponset will be seen ahead; and, on the western side of the channel, Savin Hill will appear as a high, steep hill, partly wooded, and with a number of handsome houses dotting its slopes. It will be noticeable as the only high land on the shore between Dorchester Point and Squantum. To the southward of the hill, however, and well back from the shore, will appear the summit of Mount Bowdoin,—one hundred and seventy feet high,—with its sides cultivated and its whole surface dotted with houses and orchards.

Next to the southward will appear Commercial Point, marking the western side of the mouth of the river; and to the eastward of it a low, broad, marshy point will be seen, with the mouth of the river between them. This point, called Farm Point, is the eastern point of entrance to Neponset River, and the extensive marshes, of which it is the extremity, are called Farm Meadows. There are several patches of firm ground on the peninsula, (which are under cultivation,) and two or three small groves of trees. To the eastward of it and just to the south-

ward of Thompson's Island the high land of Squantum will appear, grassy, bare of trees and under cultivation. Squantum separates Neponset Entrance from Quincy Bay,—the large shallow bay which makes in between Squantum and Hough's Neck.

On entering Neponset River between Commercial Point and Farm Point the course of the stream is at first S. by E. for nearly a mile,—between low marshy banks with occasional groves of trees,—until you are abreast of Neponset, which is seen about a quarter of a mile back from the western shore. Thence the stream makes a turn about SW. by W. for a quarter of a mile, passing under the Old Colony Railroad bridge and the county bridge just to the southward of it. Thence it runs S. by W. (still between marshy banks) for one-third of a mile, thence SW. by W. for a quarter of a mile, and continues its windings, with an average width of a little over a hundred yards, to Milton Mills Village. This village is two miles and a quarter above the mouth of the river in a straight line, but nearly three miles and a half by the windings of the river. The land upon which the village stands is high, slopes gently to the water, and is under cultivation. About a mile above the county bridge a third bridge carries the road to Railway Village across the river. All these are, of course, draw-bridges.

DANGERS

IN APPROACHING AND ENTERING NEPONSET RIVER.

Vessels intending to enter this river from the eastward will leave President's Roads when past Spectacle Islands and steer to the southwestward for Commercial Point. On this course to the southwestward will be seen a red spar-buoy on the western side of the channel. This is on Old Harbor Shoal,—the name given to the extensive flats making off from the western shore, between Dorchester Point and Old Harbor Point,—their eastern end extending to within half a mile of Thompson's Island with less than six feet at mean low water. The buoy is marked No. 2, and is placed in seven feet on the southern side of the extreme eastern end of the shoal. Nearly a mile to the southwestward of it is another red spar-buoy (No. 4), marking the eastern limits of the same shoal. It is in six feet, and bears from Dorchester Point S. $\frac{1}{4}$ W., seven-eighths of a mile, and from Fort Independence SW. by S., a mile and a quarter distant. The best water is about one-third of the way from this buoy to a black spar-buoy on the eastern side of the channel, which is on Thompson's Island Shoals, making off from Thompson's Island. It is about two hundred and fifty yards from the shore, and bears S. by E. $\frac{3}{4}$ E. from the red spar-buoy (No. 4) on Old Harbor Shoal, a quarter of a mile distant. The buoy is placed in six feet water on the northwestern side of the flats and is marked No. 1.

Old Harbor Shoal.

Thompson's Island Shoals.

The space inclosed between Thompson's Island, Farm Point and Squantum is one mass of flats, bare at extreme low tides, which it would be impossible for a stranger to avoid except at low water, when the flats on both sides show themselves. It is possible for a vessel drawing not over five feet to beat through this channel with the aid of a chart and a free use of the lead; but no one is advised to attempt it.

When abreast of the black spar-buoy on Thompson's Island Shoals there will be seen ahead and in range with Commercial Point a red spar-buoy. This is on Old Harbor Flats, which make off from Old Harbor Point in a southeasterly direction for about three-eighths of a mile. They are often called *Cow Pasture Flats*, are bare at low tide, and their southeastern edge is quite bold-to. The buoy is marked No. 6, and is placed in four feet on the extreme point of the flats. The course passes to the eastward of it, and when abreast of it leads more to the westward, with Savin Hill to the northward and a black spar-buoy nearly ahead. This is on Farm Point Shoal, which is the name given to the dry flat extending off from Farm Point in a NW. by N. direction for one-third of a mile. The buoy is marked No. 3, placed in six feet on the northwestern point of the flats, and bears from the red spar-buoy on Old Harbor Flats W. by S. $\frac{1}{4}$ S., five-eighths of a mile, and from Commercial Wharf N. by E., one-third of a mile distant.

Old Harbor Flats.

Farm Point Shoal.

The course leads to the westward of the buoy on Farm Point Shoal, and here the channel makes an abrupt turn to the southward,—passing to the westward of Half-Tide Rock, which lies on the eastern side of the channel, an eighth of a mile to the southwestward of the buoy on Farm Point Shoal. The rock is dry at half-tide, and the course passes to the westward of it,—the channel turning more to the eastward (running nearly for Farm Point) and passing to the eastward of the large square pier built on the edge of the flats off Commercial Point. When abreast of the point a black spar-buoy will be seen ahead, which is on Tilston's Flats, and the course passes to the westward of it. These flats make off from Tilston's Point (which is the first point on the eastern side of the river to the southward of Farm Point) and extend a quarter of a mile from shore with less than six feet water; and the buoy (No. 5) is placed on their western edge,—bearing from Commercial Wharf S., an eighth of a mile distant. The channel is here very narrow and difficult to navigate.

Tilston's Flats.

About three hundred yards to the southward of the buoy on Tilston's Flats will be seen another black spar-buoy. This is on Chatman's Point Flats, which make off from Chatman's Point (the first point to the southward of Tilston's) for nearly a quarter of a mile from shore and are quite bold-to. The buoy is marked No. 7 and is placed on the edge of the flats. Passing to the westward of it there will be seen, a little to the south-

Chatman's Point Flats.

ward of the course and on the western side of the channel, a red spar-buoy, which is on the eastern end of Minot's Point Flats. **Minot's Point** is the low marshy point, backed by trees, which makes out on the western side of the river nearly half a mile to the southward of Commercial Point. The flats here extend out several hundred yards from shore and the buoy (No. 8) marks their eastern extremity.

Minot's Point Flats. Passing to the eastward of the buoy on Minot's Point Flats, the course leads towards another red spar-buoy about a quarter of a mile to the southward, which is on Wood's Point Flats. **Wood's Point Flats.** Wood's Point is also on the western side of the river, just to the southward of Minot's Point. The flats make off from it for two hundred and fifty yards and the buoy (No. 10) marks their eastern edge. The course passes to the eastward of it and leads

towards a black spar-buoy, which will be seen ahead about an eighth of a mile off and in range with the eastern end of the railroad bridge. This buoy marks Seal Rock, which lies on the eastern side about one hundred and thirty yards to the northward of the bridge and is

Seal Rock. dry at low water. The buoy is marked No. 9, placed on the western side of the rock, and bears from the buoy on Wood's Point Flats **SW.** by **S.** $\frac{1}{4}$ **S.**, and from the draw in the railroad bridge **E.**, one hundred and seventy-five yards distant.

Above the railroad bridge there are no buoys.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING NEPONSET RIVER.

I. Coming from the Eastward.—From President's Roads, when the wharf on the southern end of Castle Island bears **W.** by **N.** $\frac{1}{2}$ **N.** and the western end of North Spectacle Island **S.** $\frac{1}{2}$ **E.**, steer **SW.** by **W.** $\frac{1}{2}$ **W.** for Commercial Point, which will appear between Savin Hill and Farm Point. Continue this course, carrying not less than fifteen feet water, and passing about midway between the red buoy (No. 4) on Old Harbor Shoal and the black buoy on Thompson's Island Shoals; and when abreast of the latter steer **SW.** $\frac{3}{4}$ **W.**, with the red buoy on Cow Pasture Flats a little to the northward of the course. This course will lead with not less than fourteen feet past the buoy until the centre of Savin Hill bears **WNW.**, when the depth will be three and a half fathoms, the eastern pier of Foundry Wharf will bear **W.** $\frac{1}{2}$ **S.**, and that course must be steered for the pier, carrying not less than thirteen feet water, and passing to the westward of the buoy on Farm Point Shoal. Thence the course is **SW.** by **S.**, passing to the westward of Half-Tide Rock and carrying not less than eleven feet. When within about a hundred feet of Half-Tide Rock, haul around sharply and steer **SE.** by **E.** $\frac{1}{2}$ **E.** for Farm Point, carrying between three and four fathoms. On this course, when abreast of the pier off Commercial Point steer **S.** $\frac{3}{4}$ **W.** for Commercial Wharf, passing it close-to with not less than eleven feet, and continue the course (if bound up to the village) until you are past the black buoy off Tilston's Point, to which you must give a berth of thirty yards. When this buoy is a hundred yards astern, steer **SE.** by **S.** $\frac{3}{4}$ **S.** for the black buoy off Chatman's Point, carrying not less than fourteen feet water. Give this buoy a berth of about forty yards to the eastward, and continue the course until it is about a hundred yards astern. Then steer **SE.** $\frac{1}{4}$ **E.**, carrying not less than eight feet water, until you are abreast of the red buoy off Minot's Point. On this course, if it is flood-tide, be careful not to be set on to Minot's Point. The course passes to the eastward of the buoy, and **S.** $\frac{1}{2}$ **E.** must be steered, keeping the eastern shore best aboard and carrying not less than eight feet water until you are past the red buoy off Wood's Point. Now steer **SW.** by **W.** $\frac{1}{4}$ **W.** for the draw in the railroad bridge, passing which the same course will lead to the county bridge abreast of the village. Seven feet at mean low water may be taken thus far.

II. Coming from Boston.—On the course **SE.** $\frac{1}{2}$ **S.** towards Spectacle Islands, when the buoy on Castle Rocks bears **W.**, steer **S.** by **W.** for the eastern point of Thompson's Island until Long Island Light-house is brought to bear **E.** by **S.** (On this course the least water will be three and a half fathoms.) Thence steer **SW.** by **W.** $\frac{1}{2}$ **W.** towards Commercial Point, carrying not less than fifteen feet water; and when abreast of the black buoy on Thompson's Island Flats steer **SW.** $\frac{3}{4}$ **W.**, and follow the directions given above for the river.

Above the bridge no sailing directions can be given. An inspection of the chart will guide those who have no pilot; but a pilot may always be obtained either in Boston or at the settlement on Commercial Point. Only four feet at mean low water can be carried up to Milton Mills.

QUINCY BAY.

This large but shallow bay indents the southern shore of Boston Bay just to the eastward of Neponset River. On the west it is separated from that river by the peninsula of Squantum, and on the east Hough's Neck separates it from Weymouth Fore River. Between these two points the bay is two miles and a third wide and about a mile long. Its shores are mostly low and gently sloping towards the water, cleared and under fine cultivation; but high steep hills will appear behind and over the low lands. Of these, the highest summits are those of **Forbes' Hill** and **Mount Wollaston**. The village of **Quincy** is situated about a mile inland from the shores of this bay, near its eastern end. It has no communication by water with the bay, but there is a narrow frontage on a small stream emptying into **Town River Bay**.

The peninsula of Squantum, which forms the western boundary of Quincy Bay, is of irregular shape, lies **ENE.** and **WSW.**, is a mile long, and has an average width of two-thirds of a mile. Its surface is hilly, bare of trees, and the highest land is about a hundred and twenty-five feet above sea-level. At its western end, where it joins the mainland, it is composed almost entirely of salt-meadow,—forming part of the great **Farm Meadows** which extend to Neponset River. The whole of the high land of Squantum is under careful cultivation; and its northern point, which is a steep hill one hundred feet high, has a few houses at its base. **Squantum.**

To the eastward of Squantum lies **Moon Island**, easily recognizable by the precipitous head on its eastern end. It is entirely bare of trees, and at low water is joined to Squantum by a dry flat.

Hough's Neck forms the eastern boundary of Quincy Bay and separates it from Weymouth Fore River. It is of irregular shape, lies about **E.** by **N.** and **W.** by **S.**, is about a mile long, of moderate height,—the surface being smooth and gently sloping,—and bare of trees except orchards. At its northeastern end it terminates in a smooth green hill one hundred feet high, with precipitous faces, called **Quincy Great Hill**. Two hundred yards to the northward of it, but connected with it at low water, lies **Nut Island**, a small bare islet sixty feet high, with a precipitous face on its northern side,—the cliff descending abruptly from the summit of the island to the water. The channel from the westward into Weymouth passes between this island and **Peddock's Island**. **Hough's Neck.**

Half-Moon Island lies nearly half a mile from the southern shore of Quincy Bay, off the mouth of **Black's Creek**, and is of no importance. It is a crescent-shaped sandy shoal or bank, from seven to ten feet out at low water, and covered at high water, but has the appearance of an island, when uncovered, by reason of the surrounding **Half-Moon Island**. flats being much lower.

Hangman's Island, which is a small, bare, rocky islet lying off the mouth of Quincy Bay, midway between **Moon Island** and **Nut Island**, is surrounded by shoals and must not be closely approached. It is one of the dangers in the approach to Weymouth from the westward.

WEYMOUTH FORE RIVER.

This river empties into Boston Bay to the eastward of Hough's Neck,—**Quincy Great Hill** forming the western point of entrance and **Grape Island** the eastern. That portion of the bay into which this river empties is usually called **Hingham Bay**, and its boundaries are: on the east, **Nantasket Beach**; on the north, **Point Allerton** and the shore from thence to **Windmill Point**; and on the west, **Peddock's Island** and **Hough's Neck**. **Weymouth Fore River** is quite wide at its mouth, but quickly diminishes until at the bridge it is only an eighth of a mile in width. It has not less than three fathoms water as far as the bridge and even for some distance above it; but the channel is narrow and somewhat crooked, and it is not safe for strangers to enter it.

Grape Island lies **E.** and **W.**, is about half a mile long, and has a somewhat saddle-shaped appearance when viewed from the northward,—the land in the centre being the lowest. Passing it, there opens a narrow passage, nearly dry at low water, which leads to the eastward towards **Hingham Harbor**. The southern side of this passage is formed by a long, low and narrow point, called **Lower Neck**, entirely bare of trees, as is also **Upper Neck**, just to the southward of it. The former separates **Weymouth Fore River** from **Weymouth Back River**, which empties into **Hingham Bay** just to the eastward of **Fore River**. **Grape Island.**

The entrance to **Weymouth Fore River** from the eastward is through **Nantasket Gut**,—the narrow but deep passage which leads into **Hingham Bay** between **Windmill Point** and **Peddock's Island**. **Windmill Point** is the low sandy point which makes out to the westward from the foot of **Nantasket Hill**, and was formerly occupied by extensive salt-works.

On the western side of **Nantasket Gut** will appear the high round head, with precipitous faces, which forms the northern end of **Peddock's Island**. This head is over one hundred feet high and covered only with grass. Passing to the southward, it will be seen to be connected with the rest of the island by a narrow strip of low land about three hundred yards long. The whole of the island is bare of trees and the surface undulating. The length is a mile and a quarter and the shape very irregular. On its southwestern side, between it and **Nut Island**, leads the western passage into **Weymouth**. **Peddock's Island.**

A small bare islet, lying about two hundred yards off the southern shore of **Peddock's Island**, and connected with it at low water, is called **Pen or Prince's Head**.

Bound into this river through **Nantasket Gut**, when abreast of **Prince's Head** you will pass to the westward of a small, low, bare islet called **Sheep Island**. It lies a little over half a mile to the southeastward of **Prince's Head** and about the same distance to the northward of **Grape Island**, and is surrounded by shoals and must not be closely approached. When past it, the channel leads to the southward and well to the eastward of a square **Sheep Island.**

granite beacon surmounted by a staff and cage. This is on **Pig Rocks**, which lie a little over half a mile to the westward of Quincy Great Hill.

After passing between Grape Island and Quincy Great Hill there will be seen to the westward, well in with the shore of Hough's Neck, a bare islet, called **Raccoon Island**,—connected with the neck at low water. A little to the southward the southern point of Hough's Neck runs into a long point or head, called **Rock Island Head**, sixty feet high, smooth and grassy. On its southern side the shore makes in to the westward,—forming a large cove, dry at low water, called **Rock Island Cove**, whose shores are mainly composed of meadow.

On the eastern shore of the river the first prominent point, which lies nearly opposite to Rock Island Head, is called **Eastern Neck**, and is the first point above Upper Neck. It is a long peninsula, lying **E. by W.** between Fore and Back rivers, is undulating, bare of trees, and about sixty feet high near its western end. Here the shore turns to the southward and then to the westward,—forming a shallow cove, which skirts the base of a smooth green hill with somewhat precipitous face, called **Weymouth Great Hill**, one hundred and forty-five feet high. Hence to the bridge the eastern shores are of moderate height, cleared and cultivated; and the settlement of **Old Spain** will be visible about half a mile back from the shore. All of this part of the shore presents a steep but not high face towards the river.

On the western side of the river, after passing **Gull Point**, (the southern point of entrance to Rock Island Cove,) will be seen the village of **Germantown**,—a small hamlet, situated on the northern side of the entrance to Town River Bay, which leads up to Quincy. Germantown is situated among smooth, low, cleared lands, and has several wharves both on Fore River and on Town River Bay.

On the southern side of the entrance to Town River Bay is **Bent's Point**, a long, low, thickly settled point, with wharves and docks on its eastern face. The village of **Bent's Point** occupies the shores on the southern side of the entrance to Town River Bay, as Germantown does the northern side. The county bridge crosses at this village,—the river being here about an eighth of a mile wide; but after passing under the bridge it soon widens out into a large bay.

The point on the eastern side of Fore River, where the bridge crosses, is wooded, and is remarkable as being the first wooded point met with on this side of the river. Here the eastern shores spread away to the southeastward and terminate in a shallow cove, whence a small streamlet or brook leads to **North Weymouth**. There is no passage, however, even for boats.

On the western shore, just to the southward of the bridge, opens **Ruggles' Creek**,—a shallow stream running to the westward between Bent's Point and a cleared and settled peninsula of moderate height called **Braintree Neck**. On the southern side of this peninsula makes in **Hayward's Creek**,—another shallow stream, which leads up to **Newcomb's Landing**. Above this creek the shore runs about **E SE.** for half a mile, and then turns to the southward towards **Weymouth Landing**,—the river being here contracted to the width of a small creek with a very shoal and crooked channel. The shores are almost all cleared, settled and highly cultivated, with occasional groves of trees.

Town River Bay makes in on the northwestern shore of Fore River, as before mentioned, between the villages of Germantown and Bent's Point. It is very shoal and not safe for strangers to enter at any time,—being only about one hundred and seventy-five yards wide at its entrance; but it rapidly widens, after passing Bent's Point, to nearly three-eighths of a mile. The northern shores are mostly marshy; but the southern shores are cleared and settled, with somewhat steep faces.

On the western side of the peninsula upon which Germantown is built there makes in a large but shallow cove, called **Sailor's Snug Harbor**, which is dry at low water. The name does not indicate any advantages as a harbor, but is derived from the institution of that name for superannuated ship-masters, which is built upon its banks. The eastern point of the entrance to this cove is called **Phillips' Head**.

Town River empties into the bay nearly a mile above Bent's Point, and is nothing but a small creek, very crooked and extremely shoal. The sloops which go to Quincy can only sail to the mouth of the canal.

DANGERS

IN APPROACHING AND ENTERING WEYMOUTH FORE RIVER.

I. From Nantasket Roads, through Nantasket Gut.—Vessels use this passage coming from the eastward,—passing through the Gut and steering about midway between Sheep Island and Prince's Head. In doing so they must look out for **Prince's Head Shoals**, which make off from **Peddock's Island** and **Prince's Head** for a distance of six hundred and fifty yards from the former. These shoals have from two to six feet upon them at low water, and to avoid them vessels must not go to the westward of **Windmill Point** bearing **NE. by N.** **Sheep Island**, on the eastern side of the channel, is also surrounded by flats, which are known as **Sheep Island Shoals**. They are not buoyed and are rather bold-to, so that the lead is of little use as a guide. Give them a berth of three hundred yards to the eastward.

Hough's Neck is surrounded by flats, especially on its eastern side, where they extend off from the foot of Quincy Great Hill for half a mile. On the northeastern point of these shoals there is a ledge of rocks, bare at low water, called **Pig Rocks**. They lie **E. $\frac{1}{4}$ N.** from the northern end of Quincy Great Hill, about five-eighths of a mile distant; and a square

granite beacon, surmounted by a narrow staff and cage, is erected upon them. It is painted black, but vessels using this channel pass to the eastward of it. It bears from the western end of Peddock's Island **SE.** by **S.**, about five-eighths of a mile; from Windmill point **SW.** $\frac{1}{2}$ **S.**, one mile and five-eighths; and from Sheep Island **W.** $\frac{1}{4}$ **N.**, a little over half a mile distant.

When past the beacon on Pig Rocks the course leads nearly for Weymouth Great Hill, and there will be seen ahead, about a mile off, a black spar-buoy. This is on Jack-Knife Ledge, which lies on the eastern side of the channel, an eighth of a mile to the westward of Eastern Neck. It has about three feet at lowest tides, and the buoy, which is marked **Jack-Knife Ledge.** No. 1, is placed in ten feet water on the western side of the rock. Passing to the westward, the channel leads between it and a red spar-buoy on the western side of the passage, which is on *Gull Point Flats*, sometimes called *Bass Point Flats*. They make off to the eastward from Gull Point for half a mile and are bare at extreme low tides. The buoy is marked No. 2, and is placed in ten feet water on the extreme point of the flats.

When abreast of the buoy on Gull Point Flats, a spar-buoy, painted red and black in horizontal stripes, will be seen ahead about a quarter of a mile off. This buoy is on Channel Rock, a bad ledge, lying on the western side of the channel, nearly half a mile to the eastward of Gull Point. Vessels should pass to the southward of it and give it a good berth. The channel is here very narrow, but has four fathoms water. Above this there are no dangers in the channel, but it is narrow and crooked, and the flats make off to the very edge of the deep water and are quite bold-to. Vessels must not attempt to go above Gull Point without a pilot.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING WEYMOUTH FORE RIVER.

I. *From Nantasket Roads, through Nantasket Gut.*—When past the buoy on the southeastern end of Centurion Rocks, steer **W SW.** until Nantasket Gut is fairly open, carrying not less than eight fathoms. Then steer **S.** by **W.** $\frac{1}{2}$ **W.** nearly for Sheep Island, carrying not less than three and a half fathoms, until the long wharf on the southern side of Nantasket bears **E.** $\frac{1}{2}$ **N.**, or the summit of Nantasket Hill **E.** by **N.** $\frac{1}{4}$ **N.** Thence the course is **SW.** by **S.** $\frac{1}{2}$ **S.** until you are abreast of Sheep Island, carrying not less than three and a half fathoms water; and then **S.** $\frac{1}{4}$ **E.** towards Grape Island. Continue this course for about five hundred yards, carrying not less than three fathoms, until the southeastern extremity of Sheep Island bears **NE.** by **E.** $\frac{3}{4}$ **E.**, where **SW.** $\frac{3}{4}$ **S.** will lead, with not less than three fathoms, up to the red buoy on Gull Point Flats. When past this buoy, steer **SW.** $\frac{1}{4}$ **S.** towards the buoy on Channel Rock, giving it a berth to the westward and carrying four fathoms water; and then **W.** $\frac{3}{4}$ **S.** towards Bent's Point, carrying not less than four fathoms. It is not safe to go beyond this point without a pilot.

DANGERS

IN APPROACHING AND ENTERING WEYMOUTH FORE RIVER.

II. *Coming from President's Roads, between Long Island and Spectacle Islands.*—Leaving President's Roads for Weymouth, the course leads to the southeastward through Sculpin Ledge Channel for Long Island Wharf, and when past Wharf Rock, to the southwestward towards Moon Head. On this course there will be seen ahead, and about three-quarters of a mile off, a red spar-buoy. This is on Sculpin Ledge, an obstruction already described in the dangers **Sculpin Ledge.** in the Back Way. It is a long reef, awash in several places at low water, lying about midway between Long Island and The Spectacles and on the western side of this channel. The buoy is marked No. 2, and is placed in twelve feet off the eastern end of the shoal. The course passes to the eastward of it, and when past it and in the Back Way look out for *Moon Head Flats*, which make off from Moon Head to the eastward for about an eighth of a mile with less than six feet at mean low water. They are not buoyed, but the sailing-lines lead clear of them.

When between Moon Head and the southwestern end of Long Island the channel turns to the southeastward,—running nearly for Quincy Great Hill. On this course there will be seen to the eastward a beacon of open work with a granite base and surmounted by a wooden staff and cage. This is on Sunken Island, or *Sunken Ledge*, as it is sometimes called, dry **Sunken Island.** at low water, and lying half a mile **E.** by **N.** from Hangman's Island and the same distance **NW.** $\frac{1}{4}$ **W.** from the southwestern end of Peddock's Island. There is from four to five fathoms water between it and the latter; but ten feet at mean low water is the best that can be taken between the ledge and Hangman's Island. The beacon is painted black, and should be left a quarter of a mile to the eastward.

After passing the beacon on Sunken Island the channel leads between Peddock's Island and Nut Island; and there will be seen on the western side of the channel, about half a mile to the southward of the beacon, a red spar-buoy. This is on Wreck Rock, a dangerous sunken ledge lying half a mile to the northward of Nut Island. It has three feet at low water, and the timbers of a wreck upon it are awash at low tide. The buoy is marked No. 4, and is placed in seven feet water on the northeastern side of the rock.

The courses pass to the eastward of Wreck Rock buoy and lead towards a square granite beacon with staff and cage on top. This is on Pig Rocks, a dangerous ledge lying on the northeastern point of the dry flats which make off from Quincy Great Hill. The beacon bears from the western end of Peddock's Island **SE.** by **S.**, about five-eighths of a mile; from Windmill Point **SW.** $\frac{1}{2}$ **S.**, one mile and five-eighths; and from Sheep Island **W.** $\frac{1}{4}$ **N.**, a little over half a mile distant. It is painted black, but vessels using this channel pass to the northward of it. When past it the channel continues to the eastward towards Sheep Island until you are past the eastern edge of the flats off Hough's Neck, when it turns to the southwestward into the river.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING WEYMOUTH FORE RIVER.

II. Coming from President's Roads, between Long Island and Spectacle Islands.—When, on the course through President's Roads, Long Island Light-house bears **E SE.** and the eastern end of North Spectacle Island **S.** by **W.**, steer **SE.** for the wharf near the hotel on the western side of Long Island. Continue this course, on which there will not be less than three and a half fathoms, until you are within three hundred and fifty yards of the wharf, when steer **SW.** by **S.** for the red buoy on Sculpin Ledge. On this course there is not less than eighteen feet water. Pass to the eastward of this buoy, and steer **SW.** by **W.** $\frac{1}{4}$ **W.** for Moon Head until within six hundred yards of it and the southwestern end of Long Island bears **E.** by **S.** On this course the least water is thirteen feet, and thence the course is **SE.** by **S.** $\frac{1}{2}$ **S.**, crossing the flats off Squantum in eight feet water, passing midway between Hangman's Island and Sunken Ledge in ten feet at low water, and continuing the course until you are abreast of the red buoy on Wreck Rock. Pass to the eastward of this buoy and steer **SE.** $\frac{1}{2}$ **E.** for the beacon on Pig Rocks, passing between Peddock's Island and Nut Island, and carrying not less than three fathoms water. When within two hundred and fifty yards of the beacon, with Prince's Head bearing **NE.** $\frac{1}{2}$ **N.**, steer **E.** by **S.** for Sheep Island, carrying not less than four fathoms. On this course, when within about four hundred yards of Sheep Island, steer **S.** $\frac{1}{4}$ **E.** for Grape Island, carrying not less than three fathoms; and continue this course for about two hundred and fifty yards until the southeastern point of Sheep Island bears **E.** $\frac{1}{4}$ **N.**, when steer **SW.** $\frac{3}{4}$ **S.**, following the directions previously given for the river.

III. To come through Broad Sound and enter Weymouth Fore River by the Sculpin Ledge Channel.—On the **W.** $\frac{1}{2}$ **N.** course through President's Roads, when Long Island Light-house bears **SE.** by **S.**, steer **SW.** by **S.** for Sculpin Ledge buoy, and follow the directions given above.

IV. To enter Weymouth Fore River by the Back or Western Way from Boston.—This channel is good for nine feet at low water, and has been already fully described under its proper head, to which the mariner is referred. From the black buoy on Castle Rocks steer **S SE.** for Quincy Great Hill, which will be about four miles off. This course leads in the best water (nine feet) between Thompson's Island and Spectacle Islands, leaving Thompson's Island Flats to the westward. Continue this course until the southwestern head of Long Island bears **E.** by **S.**, when steer **SE.** by **S.** $\frac{1}{2}$ **S.** towards the red buoy on Wreck Rock, carrying not less than eight feet water. When up with this buoy follow the directions given above for entering the river by the Sculpin Ledge Channel.

The rise and fall of tides is about the same as at Boston Light-house,—nine and a half feet. No observations for set and drift of tidal currents have been made; but the set is generally in the direction of the channel, and the velocity small, except at the several entrances into Hingham Bay. At Nantasket Gut the current sets directly in and out with a maximum velocity of two and a half knots; between Peddock's Island and Nut Island the drift is about one knot; and between Long Island and The Spectacles about three-quarters of a knot.

WEYMOUTH BACK RIVER.

This river empties into Hingham Bay just to the eastward of Fore River, (from which it is separated by Lower and Eastern necks,) and is narrow, crooked and shallow, and of little commercial importance. Directly across its mouth lie Grape and Slate islands, which are connected at low water and completely shut off the entrance from the northward,—leaving a very

narrow, crooked and shallow passage on each side of these islands. That on the eastern side has but five feet at mean low water, and the western channel (which leads between Grape Island and Lower Neck) has three fathoms, but is so extremely narrow as to render it impossible for anything but a steamer to keep in the best water. Six feet at mean low water is all that can be taken up to the bridge. At its mouth Weymouth Back River is nearly seven hundred yards wide, but most of this width is occupied by the large flats, dry at low water, which make off from the eastern side of the entrance, extending to the northward nearly to Grape Island and to the westward within two hundred and fifty yards of Lower Neck.

From its mouth the river runs first about **S. $\frac{1}{2}$ W.** half a mile, then turns abruptly and runs **W.** for five-eighths of a mile to a headland on the southern bank, called Stodder's Neck, which is of moderate height, but has steeply sloping faces on its northern and western sides. Its summit is bare of trees, but there is a thin growth on its western and southern slopes; and a small narrow cove makes in on its eastern side, called **Stodder's Cove**. At Stodder's Neck **Stodder's Neck**, the river widens out considerably and takes an abrupt turn **S.**, which course it continues with slight variation to its head. A quarter of a mile above the neck it is crossed by a bridge, and beyond this it is very narrow between its banks, and so continues for about one-fourth of a mile, forming what is called **The Narrows**. Above this point it becomes a wide and shallow bay, and so continues to the southward for three-quarters of a mile,—beyond which it is a mere creek.

Grape Island, which lies in an **E.** and **W.** direction across the mouth of Back River, is about half a mile long, and presents, when viewed from the northward, a somewhat saddle-shaped appearance,—the land in the middle being the lowest. It is entirely bare of trees, of moderate height, with somewhat steep faces on its northern and western sides, and is surrounded by shoals. On the east it is connected by a flat, bare at low water, with **Slate Island**, a small, **Grape Island**, low, thinly wooded island an eighth of a mile to the eastward, and about five hundred yards to the northward of the entrance to Back River. These two islands shut off any direct approach to the river, leaving only the narrow and crooked channels mentioned above.

No stranger should attempt to enter this river under any circumstances, as none of the shoals and ledges are buoyed, and no sailing directions can be given for the channel.

HINGHAM HARBOR.

The harbor is formed by a large but shallow cove which makes into the mainland in the southeastern corner of Hingham Bay. It is a mile long and seven-eighths of a mile wide at its widest part, but at low water is a dry flat with the exception of a narrow and crooked sluic which runs along the eastern shore. The village of **Hingham** occupies the southern and part of the eastern shores of this harbor. The principal entrance to this harbor is through Nantasket Gut; and when **Bumkin Island**, past the Gut the course leads to the southeastward between two small bare islands nearly a mile apart. That to the eastward, which is also much the larger of the two, is called **Bumkin Island**. It is about fifty feet high, smooth, entirely bare of trees, lies **ESE.** and **WNW.**, and is three-eighths of a mile long. Its western end is somewhat bold-to and may be closely approached; but on the east it is connected with Nantasket Beach by an extensive flat, dry at extreme low tides.

The small island on the western side of the passage is **Sheep Island**. It is low, bare, about an eighth of a mile long, and surrounded by shoal water; and from **Bumkin Island** it bears **W.** by **N.**, three-quarters of a mile distant.

The channel into Hingham leads close along the western shore of **Bumkin Island**; and here opens to the eastward a narrow channel leading into **Weir River**. On the southern side of the entrance to this river will be seen a bare grassy head, called **The World's End**, about eighty feet high, with a steep face on its western side. On its **The World's End**, southern side it is joined by a very narrow strip of low land, about one hundred yards long, to another high, smooth, grassy hill with a precipitous face on its western side. This is called **Planter's Hill**, and forms the eastern point of the entrance to Hingham Harbor. It is one hundred feet high, and its southern slopes are under cultivation.

The western point of the entrance to Hingham Harbor is called **Crow Point**; and when past **Bumkin Island** this point will appear as a high bare hill with a steep face to the northward, sixty-five feet high and bare of trees. A pier or breakwater is built out from its eastern end to the edge of the channel. Three-eighths of a mile to the southward of this **Crow Point**, point a long narrow cove, called **Walton's Cove**, makes into the western shore; and on the southern side of the entrance to this cove is a large, high, smooth hill with a somewhat steep face on its northern side, called **Otis Hill**. This hill separates **Walton's Cove** from a long narrow cove, called **Broad Cove**, which makes in on the southern side of the hill.

On the eastern side of Hingham Harbor the only indentation of any size makes in on the southern side of **Planter's Hill** and is called **Martin's Well**. All of these coves are dry at low water.

In coming into this harbor several small islands will be noticed lying apparently in the middle of the passage. The most northerly of these, which is called **Chandler's Island**, is nearly two hundred yards square, low, bare and rocky; and from **Crow Point** it bears **SE.** by **E. $\frac{1}{2}$ E.**, a quarter of a mile distant. It lies on the eastern side of the channel, which here takes an abrupt turn to the eastward, passing to the northward of two small rocky islets,—the westernmost of which, **Ragged Island**, called **Ragged Island**, lies about three hundred and fifty yards **SW.** from **Chandler's Island** and a quarter of a mile **E.** of the entrance to **Walton's Cove**. It is low, bare and rocky, three hundred yards long, and there is no passage to the westward of it except at high water. About one hundred and fifty yards **E.** of this island lies **Sailor's**

Island, also rocky and bare, lying **E.** and **W.**, and distant about two hundred yards in a **S SE.** direction from Chandler's Island. It marks the second turning point in the channel, which here runs to the southward past the eastern end of this island. The island itself is about two hundred and eighty yards long.

The channel continues to the southward from Sailor's Island for three hundred and fifty yards, then runs to the eastward until within about one hundred and fifty yards of the eastern shore, near the wharf belonging to the salt-works. Here it turns to the southward and skirts the eastern shore, at about the same distance, to the head of the harbor.

In the middle of the flats, about a quarter of a mile to the northward of the head of the harbor and a third of a mile to the southward of Sailor's Island, lies a very small bare islet, called **Button Island**, which is only about fifty yards in diameter.

DANGERS

IN COMING INTO HINGHAM HARBOR THROUGH NANTASKET GUT.

No stranger can enter this harbor without a pilot,—the channel being so narrow and so much obstructed as to render such an attempt hazardous in the extreme. A pilot can always be obtained at Hull by making the usual signal.

After passing through the Gut there will be seen ahead, nearly three-quarters of a mile off, a black spar-buoy. This is on the northwestern point of Bumkin Island Shoals, a long narrow shoal which lies three-quarters of a mile **N NW.** from Bumkin Island (western end) and has six feet at mean low water. From Windmill Point this ledge bears **S.** by **E.** $\frac{1}{2}$ **E.**, three-quarters of a mile distant. The buoy (No. 1) is placed in thirteen feet and the course passes to the westward of it. When past it you must look out for *Sheep Island*

Flats, which extend in a **NE.** direction from Sheep Island for nearly half a mile with less than six feet at low water. These flats are not buoyed, and to avoid them you must keep pretty close to the black buoy on Bumkin Island Shoals,—giving it a berth of about one hundred and fifty yards.

After passing between Bumkin Island Shoals and Sheep Island Flats the course leads towards Bumkin Island; and when abreast of the western end of that island there will be seen on each side of the channel a spar-buoy. That on the eastern side marks the southern point of White Head Flats, by which, as before mentioned, Bumkin Island is connected with the western shore of Nantasket Beach. These flats are dry at extreme low tides; and the buoy, which is painted black and marked No. 1, is also intended to mark the northern side of the entrance to Weir River.

The buoy on the western side is red and is intended to mark the eastern point of Crow Point Flats. These extensive flats make off from the northern side of Crow Point in a **N.** by **E.** direction for one mile and a quarter, and are in places bare at low water. The northern point of the flats is abreast of Bumkin Island and is not marked, but is to be avoided by keeping the western end of the island well aboard. The eastern point of the flats is marked by the red spar-buoy (No. 2) above mentioned, which is placed in eight feet water and is intended to mark the western limits of the channel into Hingham. The course passes to the eastward of it, and when past it leads towards Crow Point wharf. On this course it is necessary to look out for *the flats on the eastern side of the channel*, which make off from The World's End and Planter's Hill in a westerly direction for half a mile, and are mostly bare at low tide. They are not buoyed, and great care is necessary on the course for Crow Point to avoid them.

When past Crow Point a black spar-buoy will be seen between Chandler's Island and Ragged Island and about a quarter of a mile off. This is on Channel Rock, a small rock which lies in the middle of the channel nearly at the turning point where it leads to the eastward to run between Chandler's Island and Sailor's Island. The best water is to the southward of the buoy, which is placed in fifteen feet on the southwestern side of the rock and is marked No. 3.

Above Channel Rock there are no buoys, and the channel is too narrow and crooked to describe intelligibly. Just below the wharf at the salt-works there is a beacon in the channel, which is placed about eighty yards **N NE.** from a small rocky islet called **Beacon Island**, connected with the shore by a wharf.

SAILING DIRECTIONS

FOR COMING INTO HINGHAM HARBOR THROUGH NANTASKET GUT.

From Nantasket Gut steer **S.** by **E.** $\frac{1}{2}$ **E.** for the black spar-buoy on Bumkin Islands Shoals, carrying not less than five and a half fathoms. Pass to the westward of this buoy, about one hundred yards off, and steer **SE.** by **S.** $\frac{1}{2}$ **S.**, (passing the western end of Bumkin Island at a distance of one hundred and fifty yards,) and continue the course until you are abreast of the red spar-buoy on the eastern point of Crow Point Flats, carrying not less than sixteen feet water. Pass to the eastward of this buoy, and steer **S.** by **W.** for a quarter of a mile, (or until the northern point of The World's End bears **E.** $\frac{1}{2}$ **N.**)

and then S. by E. $\frac{1}{2}$ E. for the eastern end of Ragged Island, passing to the eastward of *Sailing Direc-*
Crow Point wharf about a hundred and fifty yards, and continuing, carrying not less *tions--Hing-*
 than thirteen feet, until you are up with the black spar-buoy on Channel Rock. Pass *ham Harbor.*
 to the westward of this, and steer E. $\frac{1}{8}$ S. between Chandler's Island and Sailor's Island.

Here good anchorage will be found in from ten to twenty feet water; but no intelligible sailing direc-
 tions can be given beyond this point, and strangers must never enter the harbor without a pilot.

If bound in through Weir River, take a pilot either at Hull or outside, as the channel is too nar-
 row and crooked for anything but steamers.

Vessels bound to Hull, after passing Windmill Point, will perceive to the eastward, close in with
 the shore of Nantasket, two spar-buoys,—one red and one black. The latter is on *Inner Seal Rock*
 and is marked No. 1. The red buoy, which is marked No. 2, is on *Outer Seal Rock*, and is in nine feet
 at low tides. The channel to Hull leads between these two buoys; but strangers had better take a pilot.

The mean rise and fall of tides in Nantasket Gut is 9.3 feet. The tidal current in Hingham
 Harbor is weak and interferes but little with a vessel's movements.

LIGHT-HOUSES IN BOSTON HARBOR.

NAME.	Latitude.	Longitude West.			Fixed or Revolving.	Interval of Flash.	Height above sea-level.	Distance visible in nautical miles.
		In arc.		In time.				
	° ' "	° ' "	h. m. s.		m. s.	Feet.		
Boston Light-house	42 19 39	70 53 25	4 43 33.7	Revolving.	0 30	111	17	
Long Island Light-house	42 19 46	70 57 23	4 43 49.5	Fixed.	.....	121	16
Narrows Light-house	42 19 21	70 55 10	4 43 40.7	Fixed red.	.....	46	12
Minot's Ledge Light-house	42 16 9	70 45 34	4 43 2.3	Fixed.	.....	92	16
Egg Rock Light-house	42 25 58	70 53 52	4 43 35.5	Fixed red.	.....	87	12

TIDES IN BOSTON HARBOR.

	U. S. Dry Dock.	Boston Light.
Corrected Establishment	11 ^h 27 ^m	11 ^h 12 ^m
Mean Rise and Fall of Tides	10.0 ft.	9.4 ft.
Mean Rise and Fall of Spring Tides	11.3 ft.	10.9 ft.
Mean Rise and Fall of Neap Tides	8.5 ft.	8.1 ft.
Mean duration of Rise	6 ^h 13 ^m	5 ^h 20 ^m
Mean duration of Fall	6 ^h 13 ^m	6 ^h 6 ^m
Mean duration of Stand	0 ^h 9 ^m	0 ^h 11 ^m
Rise of highest tide observed	15.1 ft.	12.2 ft.

CURRENTS IN BOSTON HARBOR.

STATIONS.	First Quarter.		Maximum.		Third Quarter.	
	Set.	Drift.	Set.	Drift.	Set.	Drift.
Three-eighths of a mile S. of Bird Island	NW. $\frac{1}{2}$ N.	0.8	NW. $\frac{1}{2}$ N.	1.3	NW. $\frac{1}{2}$ N.	0.9
	E. by N. $\frac{1}{2}$ N.	0.8	E. by N. $\frac{1}{2}$ N.	1.2	E. $\frac{1}{2}$ N.	0.7
Three-eighths of a mile N. of Spectacle Islands	W. $\frac{1}{2}$ N.	0.6	W. by N.	0.9	W. $\frac{3}{4}$ N.	0.7
	E. by N. $\frac{1}{2}$ N.	0.7	E. by N. $\frac{1}{2}$ N.	0.9	E. $\frac{1}{2}$ N.	0.7
W. of Long Island Light-house	SW. $\frac{1}{2}$ W.	0.5	S SW.	0.7	S. $\frac{1}{2}$ W.	0.3
	NE. $\frac{1}{2}$ N.	0.4	E. by N.	0.9	NE. by E. $\frac{1}{2}$ E.	0.4
Between Long Island Light-house and Deer Island Point Beacon.	W. by N. $\frac{1}{2}$ N.	1.4	W. by S. $\frac{1}{2}$ S.	2.5	NW. by W. $\frac{1}{2}$ W.	1.2
	E. $\frac{1}{2}$ S.	1.4	E. by S.	3.3	E. $\frac{1}{2}$ S.	2.1
Between Lovell's and Gallup's Islands	SSE.	0.3	NW. by N.	0.6	NW. by N.	0.4
	NNW.	0.2	N. $\frac{1}{2}$ W.	0.9	N. $\frac{1}{2}$ W.	0.5
Between False Spit Beacon and The Centurion Buoy	W. by S.	1.0	SW. by W. $\frac{1}{2}$ W.	1.5	W. by N.	0.6
	E. by N. $\frac{3}{4}$ N.	0.6	E NE.	1.2	E. $\frac{1}{2}$ N.	0.7
N. of Peddock's Island	W. by S. $\frac{1}{2}$ S.	1.1	W. by S. $\frac{3}{4}$ S.	2.1	W. by N. $\frac{3}{4}$ S.	1.4
	E. by N. $\frac{1}{2}$ N.	0.8	NE. by E. $\frac{1}{2}$ E.	1.3	E. by N. $\frac{3}{4}$ N.	0.6
Between Boston Light-house and Point Allerton	W. $\frac{1}{2}$ S.	1.3	W. $\frac{1}{2}$ S.	1.6	W. by S.	1.2
	E. $\frac{1}{2}$ S.	1.0	E. $\frac{1}{2}$ S.	1.5	E. by S.	1.2
W. of Calf Island	SW. by W.	0.6	SW.	1.0	SW. $\frac{1}{2}$ W.	0.6
	NE. by N. $\frac{1}{2}$ N.	0.5	NE. $\frac{1}{2}$ E.	0.6	NE. $\frac{1}{2}$ E.	0.5
Between the Outer Brewster and The Graves	SW. $\frac{1}{2}$ W.	0.6	SW. $\frac{1}{2}$ S.	1.1	SW. $\frac{1}{2}$ W.	0.7
	NE. by E. $\frac{1}{2}$ E.	0.8	NE. by E. $\frac{1}{2}$ E.	1.1	NE. by E. $\frac{3}{4}$ E.	0.6
	SW. by S. $\frac{1}{2}$ S.	0.2	W. by N. $\frac{1}{2}$ N.	0.3	W. by N. $\frac{1}{2}$ N.	0.2
Broad Sound Channels	E. by S. $\frac{1}{2}$ S.	0.3	E. by S. $\frac{1}{2}$ S.	0.5	E. by S. $\frac{1}{2}$ S.	0.4
	W. by S. $\frac{1}{2}$ S.	0.3	W. $\frac{1}{2}$ S.	0.4	W. $\frac{1}{2}$ N.	0.3
SE. of Nahant Point	NE. by E. $\frac{1}{2}$ E.	0.2	E. $\frac{1}{2}$ N.	0.4	NE. by E.	0.2

In the above table, at each station, the set and drift of the flood-tide is placed first, followed by that of the ebb. The set is given by compass; the drift is in nautical miles per hour.

VARIATION OF THE COMPASS IN BOSTON HARBOR.

The magnetic variation for 1880 is $11^{\circ} 24'$ W., with an annual increase of about $2\frac{1}{2}'$.

LIFE-SAVING STATIONS IN BOSTON BAY AND HARBOR.

There is a life-boat at Nahant, on the northeastern side, near the hotel, which can easily be launched on either side of the peninsula; at Deer Island there are three boats, one large and two small ones; at Point Allerton, inside of the buoy and rocks on the northeastern part of the point, there is another life-boat; and on Hull Beach, on the inside of the neck connecting Hull and Nantasket, there is a boat with a life-car, mortar, hawser and other means of communicating with a wreck.

On Nantasket Beach, about a mile and a quarter to the southward of Point Allerton, there are two life-boats; on Pleasant Beach, a little over a mile to the westward of the entrance to Cohasset Harbor, there is a boat; near Hominy Point, inside the western entrance to Cohasset Harbor, there are two boats; on Simon's Farm Beach (North Cohasset) there is one life-boat; on the beach near the Glades House there is a boat; at Fourth Cliff (Scituate) there is a life-boat; on North Scituate Beach, inside of Minot's Ledge and rocks, there is a boat; at Bass Cove, about a mile to the eastward of the town of Scituate, there are two boats in one house; and on the beach near Scituate Light-tower there is one large metallic life-boat, placed under the care of the Massachusetts Humane Society by the Secretary of the Treasury.

ICE IN BOSTON HARBOR.

Except during very severe winters the Main Ship Channel into Boston Harbor is kept open by the constant employment of tug-boats, which break the ice in towing vessels up and down. In the minor passages, however, (such as the Broad Sound Channels and the Back Way,) navigation is generally suspended during severe weather. Communication with Boston being as a rule, carried on through the Main Ship Channel, the ice-boats do not enter the other channels to break the ice, which consequently becomes thick and permanent.

The northern limit of the permanent ice formation may be said to be a line from the Fort Hill Channel across Dorchester or South Boston Flats around Dorchester Point; thence across the Neponset channel to Thompson's Island; thence to The Spectacles, (closing the Back Way;) thence to Long Island, (closing the Sculpin Ledge Channel;) thence across the Back Way again to Rainsford's Island; thence across Nantasket Roads to Peddock's Island; thence across Nantasket Gut to Windmill Point; and then along the southern side of the Main Ship Channel nearly to Point Allerton. Its southern limit is a line from East Boston Wharves across the flats to Apple Island,—sometimes even closing the Governor's Island Channel,—and thence to Point Shirley. The Charles, Mystic and Chelsea rivers are, as a rule, closed to navigation during the winter.

During very severe weather the ice sometimes forms as far out as the edges of the Main Ship Channel; and in exceptional cases the entire harbor is closed. This was the case during the winters of 1843-'44, 1856-'57 and 1874-'75; but the closing of the harbor in the two first-mentioned winters is attributed to the want of the necessary tug-boats to break the ice. The winter of 1874-'75 was so severe as to entirely close the harbor on several occasions between the 8th and 20th of February, 1875, notwithstanding the utmost exertions of the ice-boats. On these occasions the ice extended as far out as a line from Deer Island Point to Long Island Head; thence to Gallup's and George's islands; and thence across Nantasket Roads to Windmill Point; but these extraordinary formations were of very short duration.

As a rule, from the middle of January to the middle of February sailing vessels should not attempt to pass in or out of the harbor without the assistance of an ice-boat, as without such aid navigation is rendered extremely hazardous on account of the large quantities of drift-ice in the channel. In January and February, 1875, even steamers, although not actually prevented from entering or leaving the harbor, found their movements considerably delayed by the ice. During this same winter it was necessary to keep the ice-boats constantly at work in the channel and about the wharves to prevent the ice from entirely sealing up the harbor; but in ordinary winters no such great difficulty is experienced. Ice-boats are usually employed in the Governor's Island Channel also, as that passage is the outlet for a large quantity of the drift-ice from the upper harbor, and, if allowed to close, would back up the ice towards the mouths of the Charles and Mystic and cause disaster.

Formations of drift-ice do not occur in the harbor itself; but where there are large quantities of drifting ice in and around the entrances the channel is liable to be heavily encumbered during easterly winds. The current of ebb has considerable influence in carrying the broken ice out of the harbor; and, when assisted by fresh westerly winds, it seldom fails to clear the channels. The flood, on the contrary, has a tendency not only to hold the ice in the harbor, but also to bring drift-ice in from the bay. In strong westerly winds, however, its influence is very much modified, and, in some cases, overcome.

Shirley Gut has never been closed by ice, owing to the strong tidal current that flows through it.

The winds which are most effective in clearing the harbor of drift-ice are those from **W SW.** to **NW.**; while those from **N.** to **NNW.** are most favorable to local formations on the flats and in the minor channels; and easterly winds, as before mentioned, are apt to force the ice from outside into the harbor.

Vessels entering the harbor during the winter should not depend too much upon the buoys, as these are apt to be forced from their proper positions and even carried away by the drift-ice. As accidents of this sort occur every winter, no vessel should attempt to enter the harbor during these months without a pilot.

COHASSET HARBOR.

This harbor is situated at the southeastern end of Boston Bay, and is formed by a large but shallow cove of irregular shape which makes into the shore on the western side of Strawberry Point,—the entrance lying five miles and a quarter **SE.** from Point Allerton. The eastern and southern shores are composed almost entirely of salt-meadow, while the western shores show innumerable sand hillocks interspersed with marshy land. This harbor cannot be entered by strangers, for it is so surrounded by bare and sunken ledges as to need all the skill of those well acquainted with the locality to enable them to pass safely through. There are three channels commonly used,—one, the **Western or Brush Island Channel**, which enters between Brush Island Ledge and Chittenden's Rock; the second, leading between West Hoghead Rock and The Grampuses, called the **Middle Channel**; and the third, called the **Eastern Channel**, which leads between East Shag Rock and the West Willies.

On approaching this harbor the most conspicuous object is Minot's Ledge Light-house, built on **The Outer Minot**,—the most northerly of the Cohasset Rocks. It is a dark grey granite tower, which shows a fixed white light of the second order from a height of ninety-two feet above the sea, visible sixteen miles. At low water The Outer Minot is bare, as are also many of the rocks inshore of it between the light-house and Strawberry Point. **Strawberry Point**, which marks the eastern boundary of Boston Bay, is a low cleared point with groups of houses scattered here and there over its surface. It is a summer resort of some note,—the well-known **Glades House** being situated upon it. Masses of bare and sunken ledges, with a few bare islets, surround this point and render a close approach to it very hazardous.

**Minot's Ledge
Light-house.**

DANGERS

IN APPROACHING AND ENTERING COHASSET HARBOR.

I. Coming from the Westward, through Brush Island Channel.—Wishing to enter by this channel, the first danger met with will be found off Old Harbor, half a mile to the westward of the entrance. It is called **Black Ledge**, and is formed by a group of dry rocks surrounded by shoals, lying three-eighths of a mile to the northward of **Old Harbor Beach** and a little over half a mile **W.** by **N. $\frac{1}{2}$ N.** from Chittenden's Rock. When past it a small, round, rocky islet will appear to the southeastward, about three hundred and fifty yards distant, and a little inshore of **Black Ledge**. This is **Round Rock**, which is about ten feet out of water and bold-to, and bears from **Black Ledge SE.** by **E. $\frac{1}{4}$ E.**

Black Ledge.

Brush Island marks the western point of the entrance to Cohasset Harbor. It is a small, bare, rocky islet about two hundred yards long, lying four hundred yards from the shore and three hundred and fifty yards **SSE.** from **Round Rock**. At low water it is connected with the main shore, and from it to the northeastward shoal water extends for two hundred yards to a group of bare rocks lying on the edge of the channel. The common name, **Brush Island Ledge**, is given to all of this shoal, and it is not buoyed,—the bare rocks serving to mark the limits of the channel.

**Brush Island
Ledge.**

When abreast of **Black Ledge** and bound in by this channel a black spar-buoy will be seen about half a mile to the eastward. This is on **Chittenden's Rock**, a detached rock, bare at half-tide, lying to the westward of **The Grampuses** and on the eastern side of this channel. From **Brush Island Ledge** it bears **E.** by **N. $\frac{3}{4}$ N.**, a quarter of a mile distant. The buoy is marked No. 1, and is placed on the eastern end of the rock. When past it the channel turns to the southward, and on the eastern side of the passage there will be seen another spar-buoy, painted red and black in horizontal stripes. This is on **Barrel Rock**, a small rock, bare at half-tide, lying near the northern end of a large shoal which makes off from **Strawberry Point** nearly to the western shore, and bearing from **Chittenden's Rock S. $\frac{1}{2}$ E.**, distant a quarter of a mile.

**Chittenden's
Rock.**

Barrel Rock.

Passing to the westward of **Barrel Rock** there will be seen, a quarter of a mile still farther to the southward, and on the same shoal, a number of bare rocks, known under the general name of **Sutton Rocks**. They consist of a large dry rock, surrounded by ledges bare at low water; and the dry rock bears **N.** by **E. $\frac{1}{4}$ E.** from **White Head**, (which is the bare islet, about forty feet high, lying on the western side of the harbor, about seventy-five yards from the western shore and a quarter of a mile from the head of the harbor.) The rocks are three-eighths of a mile to the northward of this island.

Sutton Rocks.

In passing **Sutton Rocks** the course leads to the eastward of a small, round, dry rock called **Quamino Rock**. It lies one hundred and fifty yards from the western shore of the harbor and about one hundred and seventy-five yards **W.** by **S. $\frac{1}{2}$ S.** from **Sutton Rocks**. Above **Quamino Rock** the harbor is nearly all dry at low water,—there being only a very narrow slue running close under **White Head** to the head of the cove.

Quamino Rock.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING COHASSET HARBOR.

I. Coming from the Westward, through Brush Island Channel.—No intelligible sailing directions can be given by which strangers, however light their draught, may enter this harbor; but vessels

Sailing Directions--Cohasset Harbor. may approach it from Point Allerton inside Harding's Ledge by following the courses given below. When about one mile below Point Allerton, with Minot's Ledge Light-house bearing **SE.** by **E.** $\frac{1}{4}$ **E.** and the beacon on Harding's Ledge **E.** by **N.** $\frac{3}{4}$ **N.**, in five fathoms water, steer **SE.**, which will lead you up to the black spar-buoy on Chittenden's Rock. When abreast of this buoy, in about sixteen feet water, pass to the westward of it and to the eastward of Brush Island Ledge, and steer **S.** $\frac{1}{2}$ **W.** into the harbor, passing between Sutton Rocks and Quamino Rock and carrying eight feet water. Above this no directions can be given.

DANGERS

IN APPROACHING AND ENTERING COHASSET HARBOR.

II. Entering by the Middle Channel, between West Hogshead Rock and The Grampuses.—Coming from the westward bound in by this channel there will be seen, when about a mile and a half from Minot's Ledge Light-house, two spar-buoys ahead, about three-quarters of a mile off. Of these the easternmost is a black spar, and marks West Hogshead Rock, on the eastern side of the Middle Channel,—Hogshead Rock being the name given to the dry part of the ledge. The buoy is marked No. 1, and is placed in sixteen feet on the western end of the ledge. It bears from Minot's Ledge Light-house **W.** $\frac{1}{4}$ **S.**, five-eighths of a mile, and from White Head **NE.** $\frac{3}{4}$ **N.**, one mile and a quarter distant, and vessels must pass to the westward of it.

The westernmost buoy is a red spar, and is placed on the northeastern side of The Grampuses. These are extensive ledges, bare at low spring tides, lying off the middle of the approach to Cohasset Harbor, about three-eighths of a mile to the westward of West Hogshead Rock, and one mile **N.** by **W.** from the Glades House. The buoy (No. 2) is placed on the northeastern end of the northernmost ledge, and vessels using this channel pass to the eastward of it.

These two buoys (the black spar on West Hogshead Rock and the red spar on The Grampuses) mark the entrance to Cohasset by the Middle Channel. The entrance is here a quarter of a mile wide and there is not less than three fathoms anywhere between the buoys.

Passing between Hogshead Rock and The Grampuses there will be seen to the westward a high dry rock, called West Shag. It lies about three hundred and fifty yards **S.** of the red buoy on The Grampuses, a little over a quarter of a mile **SW.** by **W.** $\frac{1}{4}$ **W.** from the black buoy on the West Hogshead, and seven-eighths of a mile **W.** by **S.** from Minot's Ledge Light-house. It is tolerably bold-to on its eastern side, but to the westward bare ledges extend nearly to The Grampuses. This rock marks the turning point in the Middle Channel,—the course leading more to the westward towards White Head.

Sheppard's Ledge, which is bare at low water, lies on the southern side of the channel, about three hundred and fifty yards to the westward of Gull Island. It is but a part of the extensive ledges and shoals which make off in a northerly direction from Strawberry Point, and it bears **N.** $\frac{1}{2}$ **E.** from the Glades House, distant three-eighths of a mile. Near the northwestern side of the ledge lies a detached rock, called Jacques Rock. It is awash at lowest tides, and bears from Minot's Ledge Light-house **SW.** $\frac{1}{2}$ **W.**, seven-eighths of a mile distant. A black spar-buoy, marked No. 3, placed on the northwestern side of this rock, marks the southern limits of the Middle Channel into Cohasset and must receive a good berth to the southward.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING COHASSET HARBOR.

II. Entering by the Middle Channel, between West Hogshead Rock and The Grampuses.—
1. Coming from the Westward, inside Harding's Ledge: When Minot's Ledge Light-house bears **SE.** by **E.** $\frac{1}{4}$ **E.** and the beacon on Harding's Ledge **E.** by **N.** $\frac{3}{4}$ **N.**, steer **SE.** $\frac{1}{4}$ **E.**, carrying not less than four and a half fathoms, which will lead you up to the entrance, between the black buoy on the West Hogshead and the red buoy on The Grampuses, with not less than six fathoms. Pass midway between these buoys, in from three to four fathoms, and steer **S.** $\frac{1}{2}$ **W.**, with not less than four fathoms until you are past West Shag, when haul up **SW.** $\frac{3}{4}$ **S.** for White Head.

Should the buoy on The Grampuses be gone, the Glades House open to the eastward of West Shag will lead safely in.

2. Coming from the Eastward and wishing to enter by the Middle Channel: Vessels should pass half a mile to the northward of Minot's Ledge Light-house and steer **W.**, carrying not less than nine fathoms water, until the Glades House bears **S.** $\frac{1}{2}$ **W.**, which latter course will lead midway between

the buoy on West Hoghead Rock and that on The Grampuses, with from three to four fathoms. Continue the course until you are past West Shag, when haul up SW. $\frac{3}{4}$ S. for White Head, as before.

DANGERS

IN APPROACHING AND ENTERING COHASSET HARBOR.

III. *Entering by the Eastern Channel, between Enos' Ledge and the West Willies.*—This channel is often used by vessels coming from the eastward or from the southward; although, in the latter case, the Gangway Passage is more frequently used. In approaching it vessels must pass to the southward of Minot's Ledge Light-house; and when about half a mile to the south-eastward of it there will be seen ahead the two spar-buoys which mark the entrance. *Enos' Ledge.* The buoy to the northward is a red spar and marks the southeastern end of Enos' Ledge, a long ledge lying nearly E. and W. and dry at low water. From Minot's Ledge Light-house it bears SW. $\frac{1}{2}$ S., three-eighths of a mile distant. The buoy is marked No. 2 and defines the northern limits of this channel.

The southernmost buoy at the entrance is a black spar, and is placed on the north-western side of the West Willies, which are dry at low water, and lie five-eighths of a mile (twelve hundred yards) S SW. from Minot's Ledge Light-house and a quarter of a mile to the southward of Enos' Ledge. The buoy (No. 1) marks the southern limits of this channel. *West Willies.*

When past the red buoy on Enos' Ledge the course leads to the westward towards the buoy on Jacques Rock, and passes to the southward of a small dry rock surrounded by shoal water. This is East Shag Rock, which lies an eighth of a mile to the westward of the buoy on Enos' Ledge and half a mile SW. $\frac{1}{2}$ W. from Minot's Ledge Light-house. *East Shag Rock.* Although shoal on its northern and western sides, it is tolerably bold-to on its southern side, but is not buoyed,—being always out.

On the southern side of the channel vessels must beware of *Gull Island Ledges*, extending off to the northward and eastward from Gull Island and mostly dry at low water. The northern end of these ledges is two hundred yards from Gull Island and three hundred and fifty yards to the westward of West Willies. Passing these, the black spar-buoy on Jacques Rock, to the northward of Sheppard's Ledge, will be seen. Sheppard's Ledge, as before mentioned, is on the southern side of the channel, about three hundred and fifty yards to the westward of Gull Island, and is but a part of the extensive ledges and shoals which make off in a northerly direction from Strawberry Point. *Sheppard's Ledge.* Jacques Rock is bare at low water, and from the Glades House bears N. $\frac{1}{2}$ E., distant three-eighths of a mile. The buoy is marked No. 3, placed on the northwestern side of the ledge, and should receive a berth to the southward.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING COHASSET HARBOR.

III. *Entering by the Eastern Channel, between Enos' Ledge and the West Willies.*—When Minot's Ledge Light-house bears NW. by W., three-quarters of a mile distant, with about ten fathoms, rocky bottom, steer W., passing between the red buoy on Enos' Ledge and the black buoy on the West Willies, and carrying not less than three and a half fathoms. This course continued will lead between East Shag Rock and Sheppard's Ledge, carrying not less than seventeen feet, until you are past the black buoy on Jacques Rock, with White Head bearing SW. $\frac{3}{4}$ S. Now steer that course into the harbor.

As before remarked, no stranger, however light his draught, can enter this harbor with safety. An inspection of the chart will clearly indicate the dangerous character of the approaches.

LIGHT-HOUSE.

NAME.	Latitude.	Longitude West.			Fixed or Revolving.	Height above sea-level.	Distance visible in nautical miles.
		In arc.	In time.				
	° ' "	° ' "	h. m. s.		Feet.		
Minot's Ledge Light-house	42 16 9	70 45 34	4 43 2.3	Fixed.	92	16	

COAST FROM STRAWBERRY POINT TO SCITUATE HARBOR.

From Strawberry Point, the southwestern extremity of Boston Bay, to Scituate Point, the northern point of entrance to Scituate Harbor, the shore takes a general direction SE. by S. $\frac{1}{2}$ S., and the distance is three miles and three-quarters. It has a gentle curve to the westward, forming a sort of shallow bight, but not sufficient to afford shelter. Seen from the eastward it

will appear as undulating land of moderate height, thickly settled, dotted here and there with woods, but for the most part grassy and bare of trees. Scituate Tower will be visible as a white tower with flat top, (the lantern having been removed,) bearing $S. \frac{1}{4} E.$, distant about five miles. The whole of the shore from Strawberry Point to Scituate Point is foul,—the dangerous Stellwagen Ledges stretching along the whole distance, with many bare ledges and sunken rocks having from nine to twelve feet upon them. Strangers, therefore, should never approach this shore nearer than a mile and a half until to the southward of Stellwagen Ledge; or, in other words, should not go to the westward of Minot's Ledge Light-house bearing $NW.$

DANGERS

ALONG THE COAST BETWEEN STRAWBERRY POINT AND SCITUATE HARBOR.

Stellwagen Ledge. Stellwagen Ledge, the northernmost of the *Stellwagen Ledges*, lies one mile $SE.$ by $S. \frac{1}{4} S.$ from Minot's Ledge Light-house, is a detached rock, and has twelve feet at mean low water. A quarter of a mile $SW. \frac{1}{2} S.$ from it is *another rock with fourteen feet* at low water. To the southward of these ledges all dangers lie to the westward of Minot's Ledge Light-house bearing $N NW.$

Colomore's Ledges. Colomore's Ledges form a group of bare and sunken rocks lying between $S.$ by $E.$ and $S.$ by $E. \frac{1}{2} E.$ from Minot's Ledge Light-house,—the outermost being distant a mile from shore. This outer rock has eleven feet at mean low water and is a quarter of a mile $SE. \frac{1}{2} S.$ from the inner rocks, which are for the most part bare at low water. None of them are buoyed, but the above bearing of Minot's Ledge Light-house will clear them all. Between these ledges and the main shore is the entrance to the passage known as *The Gangway*. (See pages 36–39.) The outermost of Colomore's Ledges bears from Stellwagen Ledge $S. \frac{1}{2} W.$, distant three-quarters of a mile.

Nearly three-quarters of a mile $S.$ by $E. \frac{1}{2} E.$ from the easternmost Colomore Ledge and one mile from shore lies a small *nine feet rock*, not named. It has from eight to ten fathoms on all sides of it; but as it is not buoyed vessels should be careful not to go to the westward of Minot's Ledge Light-house bearing $N NW.$, as before. A little over half a mile $S.$ by $E. \frac{1}{2} E.$ from this rock is *another small ledge with eighteen feet* at mean low water, with soundings on all sides of it varying from twenty-two feet to eight fathoms. From Scituate Tower it bears $N.$ by $W.$ *Westerly*, distant a mile and a half, and it may be avoided, like the others of this line of rocks, by not going to the westward of Minot's Ledge Light-house bearing $N NW.$

Long Ledge. From the shore, half a mile to the northwestward of Scituate Tower, makes out Long Ledge in a $NE.$ direction for one-third of a mile. It is dry at low water, and has upon its northeastern extremity *a bare rock*, by means of which it is easily avoided. This rock bears from Scituate Tower $N.$ by $W. \frac{1}{2} W.$, distant a little over half a mile.

SCITUATE HARBOR.

This harbor is formed by a cove of irregular shape making in on the western side of Massachusetts Bay, nearly four miles to the southward of Strawberry Point and about ten miles below Point Allerton,—the southwestern point of entrance to Boston Harbor. The entrance bears from Minot's Ledge Light-house $S.$ by $E. \frac{1}{4} E.$, distant four miles and five

Scituate Tower. eightths,—its northern point being marked by a white tower forty-four feet high, and from which was formerly exhibited a white light. The light has been discontinued and the tower serves only as a day-mark.

A small light is, however, exhibited from it by private enterprise as a guide through *The Gangway*. The tower is built upon the southern extremity of *Scituate Point*, (or *Cedar Point*, as it is sometimes called,) which is low, flat and marshy, faced by sand beach. The tower bears from Minot's Ledge Light-house $S.$ by $E. \frac{1}{4} E.$, distant a little over four miles and a quarter.

The cove which forms the harbor of Scituate is about half a mile in diameter and bare at low water for about one-third of its length. It is fit only for the use of small vessels and is not at all safe for strangers. The harbor is frequented only by small fishermen and light coasters who trade to Boston, all of whom are local pilots and invariably use *The Gangway* passage into Boston Harbor. The channel is, however, pretty well buoyed, and a stranger of light draught might, at high water and in case of emergency, run in. Eight feet at high water may be taken over the bar, and thirteen feet at high water to the usual anchorage;—the mean rise of tide being about the same as at Boston Light-house,—that is, 9.3 feet.

The village of *Scituate* occupies the western shore of the harbor—its wharf-line being dry at low water.

DANGERS

IN APPROACHING AND ENTERING SCITUATE HARBOR.

When off the entrance, with the tower bearing $W.$ by $S. \frac{1}{4} S.$, distant half a mile, in four fathoms water, two spar-buoys will be seen nearly in line with each other to the southward of the tower, and bearing about $SW. \frac{1}{2} W.$ Of these the nearest is red and the other black, and they mark the northern and southern limits of the entrance. The red buoy is on *Cedar Point Shoal*, dry at low water, making off in a southeasterly direction from Scituate or Cedar Point for about two hundred yards. The buoy is marked No. 2, is placed in seven feet water, and vessels must pass to the southward of it.

The black spar-buoy on the southern side of the entrance is on Harbor Rock, a small ledge, dry at low water, lying a short distance from the southern point of entrance to the harbor,—bearing from the tower **S. $\frac{1}{2}$ W.**, distant about a quarter of a mile. The buoy is marked No. 1, is placed on the northern side of the rock in three feet water, and bears from Cedar Point Shoal buoy **SW. $\frac{1}{4}$ S.**, about four hundred yards distant. The best water is midway between the two, where there is nearly ten feet at high water.

When between the two buoys, two spindles, one red and one black, will be seen ahead, about eight hundred yards off, in a nearly **W. by S.** direction. The northernmost, which is red, is called North Beacon, and is placed on the southern end of the flats making off from the northwestern shore of the harbor and which are dry at low water. The southern spindle, which is called South Beacon, is black, surmounted by two lozenges,—one above the other at right-angles,—and is placed on the northern point of the flats making off from the southern side of the harbor, and which are also dry at low water. The channel passes directly between the spindles and is here very narrow,—being only about one hundred and thirty yards wide. Vessels can only run up at high water, and after passing the beacons may run for the wharves or lie aground in the channel in five feet at low water.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING SCITUATE HARBOR.

I. *From the Northward.*—Coming from the vicinity of Boston, bring Scituate Tower to bear **W. by S. $\frac{3}{4}$ S.**, about half a mile distant. Here the depth will be four fathoms, and the red spar-buoy on Cedar Point Shoal will be seen to the southward of the tower nearly in range with the black buoy on Harbor Rock. The course thence is **SW. $\frac{1}{2}$ W.**, aiming to pass to the southward of Cedar Point Shoal buoy and about midway between it and the black buoy on Harbor Rock, carrying not less than eight and a half feet at high water. When up with the buoys steer **W. by S.** towards the beacons, anchoring at discretion in about five feet at low water with soft bottom. If bound up to the village, the course passes midway between the two beacons in from nine to fifteen feet at high water and leads directly for the wharves. The flats are dry at low water on both sides.

Should the red buoy on Cedar Point Shoal be gone, (as it often is,) pass about four hundred yards to the southward of the tower and steer **W. by S.**, as before. Eighteen feet can be taken at low water to within six hundred yards of the bar, but not more than nine feet at high water can be taken to the anchorage, which is never used except by the small craft which belong there or by the fishing boats of the neighborhood.

II. *Coming from the Southward or Eastward.*—*From the Eastward:* When in nine fathoms, with Minot's Ledge Light-house bearing **NW. by W.**, distant five miles, Scituate Tower will bear **W. $\frac{1}{2}$ S.**, distant a mile and three-quarters. Thence steer **W. by S.**, which course made good will lead about midway between the red and black buoys at the entrance in not less than eight and a half feet at high water and up to the anchorage as before.

From the Southward: Bring Scituate Tower to bear **NW. $\frac{3}{4}$ N.** and steer for it until up with the red buoy on Cedar Point Shoal, when **W. by S.** will lead, as before, up to the anchorage.

The mean rise and fall at Scituate Entrance is about the same as that at Boston Light-house,—being 9.3 feet.

COAST FROM SCITUATE ENTRANCE TO CAPE COD BAY.

The southern point of the entrance to Scituate is low, flat, cleared and grassy, and over it the houses in the village are plainly to be seen from the eastward. Thence the shore turns about **S. by W. $\frac{1}{4}$ W.** for nearly a mile, where is a low smoothly sloping hill, also cleared and under cultivation. From this a straight shore runs **S. by E. $\frac{1}{4}$ E.** for four miles and a quarter to the entrance to North River or Marshfield Harbor. Its appearance is that of a low shore, with here and there an isolated hill with precipitous sea-faces backed by higher lands, diversified with woods and cleared fields and well settled. It is a clean shore and bold-to, and vessels may stand anywhere within three-eighths of a mile of the beach with not less than four fathoms; and in some places, especially near the entrance to North River, that depth is found at a distance of three hundred and fifty yards from the shore.

When just past Scituate, if bound to Cape Cod, a high hill of a blue appearance and looking like an island will be seen well to the southwestward. This is **Manomet Point**, on the southern side of the entrance to Plymouth Harbor. As the course is continued to the southward the low lands at Green Harbor River will appear, and with an ordinary glass may be seen covered with houses. On a clear day the two light-towers on Gurnet Point (the northern point of entrance to Plymouth) may also be seen. These lights are five miles to the southward of Green Harbor Entrance.

North River (or **Marshfield Harbor**, as it is sometimes called, from the village on its bank) is a shallow stream, very narrow at the entrance, running in a **N NW.** direction behind the outer rim of beach for nearly three miles, when it turns about **W.** by **N.** for three-quarters of a mile, and thence more to the westward, following a winding course to **Union Bridge**, a little over two miles in a straight line, but much more by the curves of the river. Thence turning to the southward it runs with a very winding course three miles and a half to **North River Bridge**. It is not navigable and is of no importance. The wide portion of North River,—that which is about two miles above its mouth,—is called **Fourth Cliff Bay**, from the steep bare hill called **Fourth Cliff**

North River.

which separates it from the Atlantic Ocean. About one mile above the mouth of the river is what is known as **White's Ferry**, where there is a wharf and a small village on the **Marshfield** or western side of the river. Here vessels have been built, and others which have been built above have received their rigging. The river at this point is about one hundred and twenty yards wide and is of little or no commercial importance. (See Professor Whiting's Report to the Superintendent of the Coast Survey, 1869.) The entrance is five miles below Scituate, and between its northern and southern points is only three hundred and fifty yards wide, contracting a short distance above the mouth to eighty yards in width. Above this point, however, it gradually widens until, about a mile and three-quarters above the entrance, it is five hundred yards wide, between marshy and sandy banks. This width it keeps until the turn, after which it gradually contracts until the village is reached. It is exceedingly shoal,—its mouth being nearly closed by dry flats,—is utterly unfit for strangers or for vessels of other than extremely light draught, and is never used except by very small vessels whose masters are well acquainted with the locality. No sailing directions can therefore be given for it other than, when abreast of the harbor, to run in, keeping about midway between its northern and southern points.

South River is a very small, narrow and crooked stream, making to the southwestward from just inside the entrance to North River. It is not navigable and is of no importance.

From North River Entrance to Green Harbor Point the distance is three miles, and the general trend of the coast **SE.** by **S.** $\frac{1}{2}$ **S.** Like that to the northward it is composed of low lands faced by sand beach covered with hillocks, with occasional higher hilly grounds cleared and cultivated. It is shoal, and should not be approached within less than three-quarters of a mile. **Green Harbor Point** (or **Brant Point**, as it is often called) is for the most part low and flat, but there are occasional patches of higher ground which are generally covered with houses. There is quite a settlement here,—the point having become a sort of watering-place. **Green Harbor River** runs on its western side, having a general course about **NE.**; but is narrow, crooked and very shoal—being closed by a bar with less than six feet upon it.

DANGERS

ALONG THE COAST BETWEEN SCITUATE ENTRANCE AND CAPE COD BAY.

In coming along this shore bound to Plymouth it is necessary to beware of three dangerous ledges obstructing the approach when to the southward of Green Harbor River. These are known, respectively, as **Howland's Ledge**, **Bartlett's** or **Egg Rock**, and **High Pine Ledge**,—the two former being close together off **Green Harbor Point**. The last mentioned, however, is three miles to the southward of that point and two miles to the northward of the **Gurnet Light-houses**, and all three are marked by red spar-buoys.

Howland's Ledge. Howland's Ledge lies **SE.** by **E.** $\frac{3}{4}$ **E.** from the eastern extremity of **Brant Point**, distant one mile and one-eighth, and **N.** $\frac{1}{4}$ **W.** from the **Gurnet Light-houses** about four miles and a half. It is a detached rock, with seven feet at mean low water and five at low spring tides, and is marked by a red spar-buoy (No. 4) placed in fifteen feet water on its eastern side. Five-eighths of a mile **W.** $\frac{1}{4}$ **N.** from this buoy will be seen another red spar, marked No. 2. This is on **Bartlett's Rock**, sometimes called **Egg Rock**, bare at low water, lying five-eighths of a mile **SE.** $\frac{1}{2}$ **E.** from **Brant Point** and nearly two miles **N.** $\frac{1}{2}$ **W.** from the **Gurnet Light-houses**. The buoy is placed in three and a half fathoms, rocky bottom, on the eastern side of the dry rock, close-to; but it is not safe for strangers to pass between this and **Howland's Ledge**, as the bottom is rocky and broken. Shoal water extends from the dry rock to the northeastward for half a mile, and there is no safe passage between it and **Brant Point**.

At **Green Harbor River** begins what is known as **Duxbury Beach**, which has a general course **S.** by **E.** $\frac{1}{2}$ **E.** for about four miles and three-quarters to **Gurnet Point**,—the northern point of entrance to **Plymouth Harbor**. For the most of this distance it is a mere strip of beach separating **Duxbury Harbor** from the sea. About three-quarters of a mile off its eastern face and nearly two miles above **Gurnet Point** will be seen a red spar-buoy. This is on **High Pine Ledge**, which has two feet at mean low water and is awash at low spring tides. From **Howland's Ledge** it bears **S.** $\frac{1}{4}$ **E.**, distant two miles and three-quarters, and there is no safe passage between it and the beach. The buoy is placed in fifteen feet, sandy bottom, on the eastern edge of the shoal, is marked No. 6, and vessels must always pass to the eastward of it.

A more detailed description of the above dangers will be found in the approaches to **Plymouth Harbor**.

CAPE COD BAY

that large nearly circular bay contained between Cape Cod on the east and south and the main land of Massachusetts on the west. Between these limits it is about ten miles in diameter, with deep water, (the soundings varying from ten to twenty-seven fathoms except close to the shore,) and is almost entirely unobstructed. Its eastern point of entrance is called Race Point, (the northwestern extremity of Cape Cod,) and upon it there is a light-house showing a fixed white light varied by flashes. Its western point of entrance is called Gurnet Point, and upon it are built two light-towers showing fixed white lights. From Race Point to Gurnet Point the distance is sixteen miles and a quarter, and the bearing **W. $\frac{1}{2}$ S.** Within the limits of Cape Cod Bay are embraced several important harbors,—those of Plymouth and Duxbury on the western shore, Barnstable and Yarmouth on the southern, and Wellfleet and Provincetown on the eastern shore. The last mentioned, which is formed by the Hook of the Cape at its northern end, is one of the most important harbors of refuge on the coast of the United States—being easy of access, with good holding-ground, and sufficient water for the largest vessels. The other harbors are comparatively shoal and are only used by coasters and fishermen.

CAPE COD

is the eastern extremity of Massachusetts, and is formed by a long peninsula making out from the mainland, first in an easterly direction for thirty-one miles, and then nearly due **N.** for a little over twenty miles,—this latter portion forming what is usually termed the **Hook of the Cape.** It is composed almost entirely of sandy lands, diversified with high, bare sand hills, and low, nearly level plains well cultivated and thickly settled. On its northern side is Cape Cod Bay, and on its southern Nantucket and Vineyard sounds, into and through which passes nearly all of the coastwise trade of the New England States. Cape Cod is the centre of a very large portion of the fishing trade of Massachusetts,—that being in fact the principal source of revenue of the different towns on its shores. Of these may be mentioned Provincetown, at its northern extremity; Wellfleet, on the western shore of the Hook; Barnstable, on the northern side of the main part of the cape; Pocasset, on the western shore; and Falmouth, Hyannis, Yarmouth, Dennis, and Chatham, on the southern shore. All of these have more or less fishing interest and some coastwise trade.

The extreme northern point of Cape Cod is called Race Point, and is composed of low sand hillocks, bare of trees and for the most part of grass. Upon one of these hillocks, at its western extremity, stands the light-house which is the guide to vessels entering Cape Cod Bay from the southward or eastward. Race Point Light-house is an iron tower thirty-five feet high, painted red, and showing a fixed white light, varied by flashes at intervals of a minute and a half, from a height of fifty-one feet above the sea. The light is of the fourth order of Fresnel, and is visible twelve miles. About one hundred yards to the northeastward of the light-house is the house containing the fog-signal, which consists of a twelve-inch steam fog-whistle, giving blasts of four seconds, with alternate intervals of eight and forty-four seconds. The geographical position of the light-house is

Race Point and Light-house.

Longitude ----- **70° 14' 36" W.**
 Latitude ----- **42° 3' 43" N.**

The southeastern extremity of Cape Cod is called Monomoy Point, and is composed entirely of low, flat sand beach destitute of trees or grass. Near its southern extremity is built the light-house, which is a guide to vessels entering Nantucket Sound from the eastward. Seen from the northeastward, this light-house will appear as a red tower with a low white house at its base and several small houses to the southward of it on the extreme point. Monomoy Point Light-house is a cast-iron tower, painted red, with a black lantern, and is connected with the keeper's dwelling by a covered way. It shows a fixed white light, of the fourth order of Fresnel, from a height of forty-one feet above the sea, visible twelve miles. Its geographical position is

Monomoy Point and Light-house.

Latitude ----- **41° 33' 32" N.**
 Longitude ----- **69° 59' 38" W.**

The southwestern extremity of Cape Cod is called Nobska Point, and also carries a light-house. At this point the cape is separated from the Elizabeth Islands by a passage called Wood's Hole, which is very frequently used both as a thoroughfare and a harbor of refuge by coasting vessels. Nobska Point is a high, round, grassy head, with slightly undulating surface and steep sandy cliffs. The light-house is a red tower, thirty-five feet high, on the summit of the head. Nobska Point Light-house shows a fixed white light, of the fifth order of Fresnel, from a height of eighty-nine feet above the sea, visible thirteen miles. Its geographical position is

Nobska Point and Light-house.

Latitude ----- **41° 30' 55" N.**
 Longitude ----- **70° 39' 19" W.**

Besides the above light-houses there are several on the eastern face of the cape,—the most prominent of which are, first, Cape Cod Light-house, or Highland Light-house, (as it is sometimes called,) which is of the first order, visible twenty miles, and situated on the summit of the Highlands of the cape, in

Latitude ----- **42° 2' 21" N.**
 Longitude ----- **70° 3' 39" W.**

Second, the **Nauset Beacons**, three white towers on the hills back of the beach near **Eastham**, twelve miles to the southward of the Highlands. These show fixed white lights, of the fourth order, from a height of ninety-three feet above the sea, visible eleven miles. Third, the **Chatham Light-houses**, on the western side of Chatham Harbor, (about eleven miles below Nauset Beacons,) which are two white towers, showing fixed white lights, of the fourth order, from a height of eighty feet above the sea, visible fourteen miles. *These are all sea-coast lights.*

The western point of entrance to Cape Cod Bay is called **Gurnet Point**, and has upon it two light-towers, which serve as a guide for vessels entering the bay on its western side and for those bound into Plymouth Harbor. The point is a round bluff, showing precipitous sandy faces seventy feet high, with level summit cleared and cultivated. Seen from the eastward its round shape does not appear, but it looks like a long sandy bluff with steep faces, bare of trees. **Gurnet Point Light-houses** (or **Plymouth Light-houses**, as they are sometimes called) are two octagonal wooden towers, painted white, and thirty-one feet apart in a **NW.** and **SE.** direction. Each tower shows a fixed white light of the fourth order of Fresnel; but the northwestern light, being one hundred and two feet above the sea, is visible eleven miles; while the other, being used only as a range, cannot be seen farther than six miles. There is no fog-signal. The geographical position of these light-houses is

Latitude ----- 42° 0' 10" N.
Longitude ----- 70° 36' 3" W.

PLYMOUTH HARBOR.

Gurnet Point is the northern point of entrance to Plymouth Harbor, the northernmost harbor in Cape Cod Bay, affording an excellent and safe anchorage for vessels caught in easterly storms. It is in reality composed of three different harbors:—**Duxbury Bay**, making in to the northward behind Duxbury Beach, and on the western shore of which is built the village of Duxbury; **Kingston Bay**, making to the westward towards the village of Kingston; and **Plymouth Harbor proper**, making to the southward between Long Beach and the main, and on the western shore of which is built the town of Plymouth. All these have a common entrance between Duxbury Pier on the north and Pier Head (the northern point of Long Beach) on the south; and all are mainly occupied by flats through which wind very narrow and intricate channels. The real harbor of refuge, and the only anchorage fit for strangers, is in the lower part of Duxbury Bay, and is called **The Cow Yard**. Here anchorage in from three to six fathoms may be found, with good holding-ground, and it is very frequently resorted to by coasters.

In coming in from the eastward **Gurnet Point** and its light-houses will of course be the most prominent objects visible, and to the southward of them the town of Plymouth will appear over Long Beach,—which latter will not be visible. The land will appear of moderate height, undulating, with wooded hills behind it,—the town being built on the lower lands, at the edge of the harbor. When sufficiently near, Long Beach will appear as a long, narrow strip of sand beach, extending nearly **N.** and **S.** from Warren's Cove to within about nine hundred yards of Duxbury Pier,—being two miles and five-eighths long. At **Pier Head**, its northern end, there is a beacon on the breakwater, which is used as a guide for the channels in the Inner Harbor; but vessels seeking a refuge have nothing to do with it.

On the northern side of the entrance the shore turns abruptly to the northwestward from **Gurnet Point** for about half a mile; then to the west and southwest for one mile and a quarter to a somewhat steep sandy head known as **Saquish Head**, which has a lone tree on it forming a conspicuous mark. All of the shore from **Gurnet Point** to this head is called **Saquish Neck**, and is composed entirely of low, flat, marshy land, faced on the southern side by sand beach and sand hillocks. It forms the southern boundary to Duxbury Bay,—sheltering it from southerly winds. There is no anchorage in the cove formed by the curve of the shore of **Saquish Neck**, as it is dry at low water.

On the southern side of the entrance will be seen (except at high water) a long, narrow strip of sand extending to the eastward from **Pier Head** to within one mile and an eighth of **Gurnet Point**. This is **Brown's Bank**, or, as it is sometimes called, **Brown's Island**, and is a very dangerous sand-bar to vessels entering this harbor at night. **Saquish Neck** continues to the westward beyond **Saquish Head** for only four hundred yards, where it terminates in a low sandy point, forming the eastern point of entrance to Duxbury Bay. About five-eighths of a mile to the westward of this point will be seen a large square granite beacon, and near it a red light tower about forty feet high. The beacon is known as **Duxbury Pier**, and is built upon the end of the flat making off to the westward from **Saquish Head** and to the southward from **Clark's Island**. The light-house is called **Duxbury Pier Light-house**, and is placed in seven feet water off the end of the flats as a guide to Kingston, Duxbury, and the entrance to the Inner Harbor of Plymouth. Vessels entering **The Cow Yard** must turn around it to the northward, passing to the westward of it. The tower shows a fixed white light, of the fifth order, from a height of forty feet above the water, visible eleven miles. Its geographical position is

Latitude ----- 41° 59' 13" N.
Longitude ----- 70° 38' 56" W.

When past **Duxbury Pier Light-house** and entering **Duxbury Bay** a small island will be seen to the northeastward about one mile off and close to the northern shore of **Saquish Neck**. This is **Clark's Island**, and will appear of moderate height, with somewhat steep shores and cleared summit, nearly level, cultivated, and with one or two houses upon it. It lies **NNE.** and **SSW.**, is about five-eighths of a mile in length, and is surrounded by flats dry at low water. There is no passage between it and **Saquish Neck**; but on its western side it is tolerably bold-to, and the channel into **The Cow Yard** and up towards Duxbury passes it on that side.

Duxbury Bay is a large bay of irregular shape contained between Duxbury Beach on the east, Saquish Neck on the south, and the mainland on the west. It is about two miles and a half long, with an average width of two miles; but is almost all occupied by flats dry at low water, and intersected by various narrow channels, which, however, are not navigable without a pilot. In the lower part of the bay there is deep water, (from three to six fathoms,) with good anchorage in what is called **The Cow Yard**. A narrow channel, through which eight feet may be taken, leads up to **Duxbury Bay**. **Duxbury**, but the wharf-line of the village is all dry at low water. Another channel leads along the western shore of Clark's Island, and thence gradually approaches **Duxbury Beach**, which it skirts for some distance, and enters a narrow and shoal stream called **Back River**. Seven feet at low water may be taken up to **Powder Point**, (the western point of entrance to this river,) but not more than four feet above that point. The channel is narrow and intricate and is not fit for strangers.

Kingston Bay, contained between the main land and the western point of Duxbury Bay, has a diameter of about a mile and a half, but is so full of flats as to render its navigation entirely unsafe, even with a pilot, except at high water. The village of **Kingston** is built upon its western shore, (about three-quarters of a mile back from the water,) on a small stream called **Jones' River**. The bay is of no importance as a harbor or port and is rarely entered.

Plymouth Inner Harbor is also unfit for navigation except for steamers, or, at high water, for vessels having pilots. The channel, which is very narrow, runs first to the southward along the western side of Long Beach for three-quarters of a mile; then turns abruptly at right angles, running to the westward towards the town of **Plymouth** for about half a mile; and then to the southeastward towards the head of the harbor for about the same distance. There is no passage, except at high water, beyond **Holmes' Point**, at the southern end of the town.

The beacon on the northern end of Long Beach is commonly known as **Breakwater Beacon**, and is composed of granite open work, built square, surmounted by staff and cage, and painted black. Small vessels often find good anchorage under the lee of Long Beach, just to the southward of this beacon, in from three to four fathoms water.

The channel up to Duxbury must not be attempted by strangers.

DANGERS

IN APPROACHING AND ENTERING PLYMOUTH HARBOR.

I. *Coming from the Northward alongshore.*—Vessels bound to Plymouth from Cape Ann or Boston will meet with no dangers after passing the Stellwagen Ledges until up with Brant Point, (the eastern point of entrance to Green Harbor River,) when they must look out for Howland's Ledge, a detached rock, with seven feet at mean low water, lying **SE. by E. $\frac{3}{4}$ E.** from the eastern extremity of Brant Point, distant one mile and an eighth, and **N. $\frac{1}{4}$ W.** from Gurnet Point Light-houses, about four miles and a half distant. It is marked by a red spar-buoy (No. 4) placed in fifteen feet water on its eastern side. Five-eighths of a mile **W. $\frac{1}{4}$ N.** from this buoy will be seen another red spar, marked No. 2. This is on Bartlett's Rock, sometimes called *Egg Rock*, bare at low water, lying five-eighths of a mile **SE. $\frac{1}{2}$ E.** from Brant Point and nearly two miles **N. $\frac{1}{4}$ W.** from Gurnet Point Light-houses. The buoy is placed in three and a half fathoms, rocky bottom, on the eastern side of the dry rock, close-to. It is not safe for strangers to pass between this buoy and Howland's Ledge, as the bottom is rocky and broken. Shoal water extends from the dry rock to the northeastward for half a mile, and there is no safe passage between it and Brant Point.

Howland's Ledge.

Bartlett's Rock.

S. $\frac{1}{4}$ E. from Howland's Ledge, two miles and three-quarters distant, and about seven-eighths of a mile from the shore of Duxbury Beach, another red spar-buoy will be met with. This is on High Pine Ledge, which has two feet at mean low water and is awash at low spring tides. It is nearly two miles above Gurnet Point, from which it bears **N. $\frac{1}{4}$ E.**, and there is no safe passage inshore of it. The buoy, which is marked No. 6, is placed in fifteen feet, sandy bottom, on its eastern edge, and vessels must always pass to the eastward of it.

High Pine Ledge.

When past the buoy on High Pine Ledge there are no more dangers until you are up with Gurnet Point, when a number of red and black buoys will be seen, which mark the limits of the channel. Of these, the first met with will be a red spar-buoy, about three-eighths of a mile to the eastward of Gurnet Point, which is on Gurnet Rock, a detached ledge with four feet at mean low water, lying a quarter of a mile **SE. by E. $\frac{3}{4}$ E.** from Gurnet Point, and on the northern side of the channel. The buoy is marked No. 2, and is placed in eighteen feet on the eastern side of the rock. It is not safe to go to the westward of the buoy, as there is another rock, with nine feet at low water, close to it on that side.

Gurnet Rock.

When up with Gurnet Rock a black nun-buoy will appear on the southern side of the entrance and about five-eighths of a mile off. This is on the eastern end of Brown's Bank, the long shoal before mentioned (see page 62) as making off from Pier Head in an easterly direction for two miles and a quarter,—most of it being dry at low water. The dry part is sometimes called **Brown's Island**, but the general name Brown's Bank is applicable to the whole shoal. The black buoy is a nun of the second class, marked No. 1, and is placed in

Brown's Bank.

twenty feet water close to the edge of the three-fathom curve, but over half a mile from the actual end of the bank. It bears from Gurnet Point Light-houses **S.** by **E.** $\frac{3}{4}$ **E.**, distant three-quarters of a mile.

On the northern side of the channel, about eight hundred yards **SW.** by **W.** $\frac{1}{2}$ **W.** from Gurnet Rock buoy, there will be seen a red spar-buoy. This is on Bass Rock, which has four feet at low water and bears from Gurnet Point Light-houses **S.** $\frac{1}{2}$ **W.**, distant a little over five hundred yards. The buoy is marked No. 4, placed in fifteen feet water on the southern side of the rock, and from it

	Miles.
Saquish Point buoy bears W. $\frac{5}{8}$ S.	1 $\frac{1}{2}$
Duxbury Pier Light-house W. $\frac{1}{4}$ S.	2 $\frac{1}{4}$
Breakwater Beacon on Pier Head W. by S.	nearly 2 $\frac{3}{4}$

When up with the buoy on Bass Rock there will be seen, on the southern side of the channel and nearly half a mile to the southwestward, a black spar-buoy. This is on the eastern end of the Shoal of Brown's Bank. There is a passage for vessels drawing less than twelve feet between this and the nun-buoy (No. 1, already described) half a mile to the eastward of it. The buoy is marked No. 3, placed in three fathoms on the northern side of the eastern point of the shoal, and bears from Gurnet Point Light-houses **S SW.** Westerly, distant nearly three-quarters of a mile. From it Duxbury Pier Light-house bears **W.** $\frac{1}{2}$ **N.**, exactly two miles distant.

The whole of the northern side of the channel from Bass Rock buoy to Saquish Point is shoal, and a stranger should not go to the northward of Duxbury Pier Light-house bearing **W.** $\frac{1}{4}$ **S.** until a red spar-buoy off Saquish Head is seen, marking the northern limits of the channel. This buoy is on Saquish Point Shoal, making off from the point in a southerly direction for nearly a quarter of a mile. The buoy is placed in eighteen feet on its southern end and bears from Gurnet Point Light-houses **W.** by **S.** $\frac{3}{4}$ **S.**, one mile and five-eighths, and from Duxbury Pier Light-house **E.** $\frac{1}{4}$ **S.**, three-quarters of a mile distant. A quarter of a mile **NE.** $\frac{1}{2}$ **E.** from this buoy is a detached rock, called *Saquish Head Rock*, with six feet water, lying three hundred yards to the southward of Saquish Head. It is not buoyed.

Opposite to Saquish Point buoy, on the southern side of the channel, will be seen a black spar-buoy, which is placed about opposite the Middle of Brown's Bank on its northern side. It is a mile and three-eighths to the westward of the buoy (No. 3) on the eastern end of the shoal, is marked No. 5, and placed on the edge of the flats in eighteen feet water. From Duxbury Pier Light-house it bears **SE.** by **E.** $\frac{3}{4}$ **E.**, distant three-quarters of a mile. The channel between this and Saquish Point buoy is about five hundred and fifty yards wide.

When between the two buoys, two spar-buoys—one red, one black—will appear about three-quarters of a mile to the westward, off Duxbury Pier. The red buoy is on the southern point of Muscle Bank, the name given to that extensive bank making off from Saquish Head and Clark's Island, (in a nearly **W SW.** direction from the former and about **SW.** $\frac{1}{2}$ **S.** from the latter,) with Duxbury Pier on its southwestern extremity. It is for the most part dry at low water, and extends from Saquish Point about five-eighths of a mile and from Clark's Island nearly a mile. The buoy marks the southern side of its eastern point, is placed in eighteen feet water, marked No. 8, and the course passes to the southward of it.

Opposite to the buoy on Muscle Bank, bearing about **W.** by **S.** $\frac{1}{4}$ **S.**, a little over three hundred yards distant, is a black spar-buoy marking the southern limits of the channel—here only about three hundred and twenty-five yards wide, but having fourteen fathoms water in it. The buoy is on Dick's Flats, making off from the southwestern shore and obstructing the entrance to the Inner Harbor of Plymouth as well as the passage to Kingston and into The Cow Yard. On the eastern edge of the flats, in fifteen feet water, is placed the buoy, which is marked No. 7, and is the turning point for vessels bound into the Inner Harbor. Bound into The Cow Yard the course passes between this buoy and the red buoy on the southern end of the Muscle Bank, and then turns to the northward, passing to the westward of Duxbury Pier Light-house. When past the light-house a black spar-buoy will be seen ahead about four hundred yards off. This is on Captain's Flat, and marks the western limits of the channel. A red spar-buoy was formerly placed on the eastern side of the channel, in three fathoms water, three hundred yards **N.** by **W.** $\frac{3}{4}$ **W.** from Duxbury Pier Light-house and one mile **SW.** from the southern end of Clark's Island; but this has been removed.

The black spar-buoy on the western side of the channel is on Captain's Flat, an extensive shoal making off from the western point of entrance to Duxbury Bay for three-quarters of a mile and for the most part bare at low water. The buoy is marked No. 9 and is placed in three fathoms water, soft bottom, on the southeastern point of the flat. The channel into The Cow Yard passes between this buoy and the western edge of Muscle Bank. Captain's Flat is

however, cut by a very narrow and crooked slue which leads along the western shore of Duxbury Bay up to the wharf-line of the village. It is very shoal and should never be attempted by any but small vessels, and by these only at high water. The flat obtains its name from the high smooth hill called Captain's Hill, bare of trees, rising from the western point of entrance to Duxbury Bay, between it and Kingston Bay. There are quite a number of houses on its slopes and some near the summit.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING PLYMOUTH HARBOR.

I. Coming from the Northward alongshore.—When off Minot's Ledge, with the light-house bearing **SW.** $\frac{1}{2}$ **S.**, distant one mile and a quarter, with a depth of about thirteen fathoms, steer **S.** by **E.** $\frac{1}{2}$ **E.**, carrying not less than seven fathoms water. Continue this course past Brant Point and Howland's Ledge until Gurnet Point Light-houses bear **S.** by **W.** $\frac{1}{2}$ **W.**, distant five miles and three-quarters. Here the depth will be ten fathoms and you may steer **S.** $\frac{3}{4}$ **W.** for the entrance, carrying not less than eight fathoms, until Gurnet Point Light-houses are in range on a bearing of **NW.**, five-eighths of a mile distant, with Duxbury Pier Light-house bearing **W.** On this position you will have nine fathoms and must steer **W.** $\frac{3}{4}$ **S.** for about two miles, passing between the red buoy on Bass Rock and the black buoys on the eastern end of Brown's Bank and carrying not less than four fathoms water. When Duxbury Pier Light-house bears **W.** by **N.** $\frac{3}{4}$ **N.**, three-quarters of a mile distant, the depth will be five and a half fathoms, with the red buoy on Saquish Point to the northward and the black buoy off the dry part of Brown's Bank to the southward, and both nearly abeam. Now steer **W.** $\frac{3}{4}$ **N.** for three-quarters of a mile, carrying not less than eight fathoms, until midway between the red buoy on the southern point of Muscle Bank and the black buoy on Dick's Flats. Here the depth will be thirteen fathoms, hard bottom, with Duxbury Pier Light-house bearing **N NE.**, two hundred and fifty yards distant. Now steer **N.** by **W.** $\frac{1}{2}$ **W.** for a quarter of a mile, passing to the westward of Duxbury Pier Light-house and carrying not less than four fathoms. This course will lead up to the black buoy on Captain's Flat. When past this buoy anchorage is found in its vicinity in from three to five fathoms, soft bottom; or you may steer **NE.** by **N.** $\frac{3}{4}$ **N.** into The Cow Yard, where anchorage may be found in from three to six and a half fathoms, or off the western shore of Clark's Island, in the same depth.

The course given from off Minot's Ledge passes three-quarters of a mile outside of the Stellwagen Ledges, and five-eighths of a mile to the eastward of the red buoy on Howland's Ledge. The course for the entrance passes five-eighths of a mile to the eastward of High Pine Ledge, and three hundred yards to the eastward of the red buoy on Gurnet Rock. The courses in pass six hundred yards to the northward of the black nun-buoy off the eastern end of Brown's Bank; three hundred and fifty yards to the southward of the red buoy on Bass Rock; two hundred and fifty yards to the northward of the black spar-buoy on the eastern end of Brown's Bank; four hundred yards to the southward of the red buoy on Saquish Point; two hundred yards to the northward of the black buoy off the dry part of Brown's Bank; one hundred and fifty yards to the westward of the red buoy on the southern point of Muscle Bank, and the same distance to the eastward of the black buoy on Dick's Flats; about two hundred yards to the westward of Duxbury Pier Light-house; and midway between Muscle Bank (western end) and the black buoy on Captain's Flat.

If bound to Duxbury: When between the red buoy on the southern point of Muscle Bank and the black buoy on Dick's Flats, in thirteen fathoms, as before, steer **NW.** by **W.** $\frac{1}{2}$ **W.** for about half a mile, which will lead you up to a depth of nine feet water about a quarter of a mile to the westward of the buoy on Captain's Flat. Beyond this it is dangerous to go without a pilot.

If bound to Plymouth Inner Harbor: Round the black buoy on Dick's Flats, passing to the northward of it, and steer **SW.** $\frac{1}{2}$ **S.** for half a mile, carrying not less than twelve feet water, until Breakwater Beacon bears **E.** by **N.** $\frac{1}{2}$ **N.**, three hundred yards distant. Here the depth will be about three fathoms, and the course thence is **S SE.** along the western side of Long Beach, carrying not less than fourteen feet water. Good anchorage is found anywhere along this line in from three to four fathoms water just below the Breakwater Beacon; but the anchorage is not recommended for strangers, although small vessels may find it convenient occasionally to use it.

DANGERS

IN APPROACHING AND ENTERING PLYMOUTH HARBOR.

II. *Coming from the Southward, from the southern part of the bay.*—If coming from Sandwich or Barnstable, there are several detached rocks off the western shore to be avoided. Of these, the first met with lies off **Indian Hill**, (which is the high wooded hill with precipitous sea-faces lying two miles and a quarter to the southward of Manomet Point,) and is a small detached rock called **Stellwagen Rock**, having six feet at mean low water, and bearing from the centre of Indian Hill **NE. by E. $\frac{1}{4}$ E.**, one mile distant, and from Manomet Point **S. by E. $\frac{1}{2}$ E.**, two miles distant. It is not buoyed, but almost always shows itself by breakers. There is good water (that is, from four to seven fathoms) on both sides of it, but strangers had better keep to the eastward.

Off Manomet Point there are several rocks, the most easterly of which are two small detached ledges known as **Mary Ann Rocks**. They lie **NE.** and **SW.** of each other, about three hundred yards apart, and are dry at low water,—the easternmost rock bearing from the northeastern extremity of Manomet Point **SE. $\frac{3}{4}$ E.**, distant seven-eighths of a mile.

There is no safe passage to the westward of these rocks, as the bottom is much broken; and besides, half a mile to the westward of them lie two small rocks called **Stone Horse Rocks**, also bare at low water. These rocks lie one-quarter of a mile **E. by S.** from the southeastern extremity of Manomet Point; and a long narrow shoal extends from them in a **SE. by S. $\frac{1}{2}$ S.** direction for three-eighths of a mile, with but six feet water on its southern end.

There are also several outlying rocks to the northward of Manomet Point, between it and **Rocky Point**, (which is about two miles and a half to the northward of it;) but the courses do not pass anywhere near them, and it is unnecessary to make more particular mention of them.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING PLYMOUTH HARBOR.

II. *Coming from the Southward, from the southern part of the bay.*—*From Sandwich Entrance* steer **N. $\frac{1}{2}$ E.** until Manomet Point bears **SW. $\frac{3}{4}$ W.**, distant two and three-quarter miles, when the depth will be sixteen fathoms and Gurnet Point Light-houses will be in range bearing **NW.**, five miles distant. Now steer for the lights, keeping the range and carrying not less than nine fathoms, until within five-eighths of a mile of them. On this course, when Duxbury Pier Light-house bears **W.** steer **W. $\frac{3}{4}$ S.**, carrying not less than four fathoms, until the same light bears **W. by N. $\frac{1}{4}$ N.**, when steer **W. $\frac{3}{4}$ N.**, following the directions previously given. These courses pass a mile to the eastward of Stellwagen Rock; the same distance to the eastward of Mary Ann Rocks; and six hundred yards to the eastward of the nun-buoy off the eastern end of Brown's Bank.

Coming from Barnstable: From the entering buoy the course is **NW. by N. $\frac{1}{2}$ N.** until Manomet Point bears **SW. $\frac{3}{4}$ W.**, two miles and a quarter distant, when the depth will be sixteen fathoms, and the course **NW.** for Gurnet Point Light-houses in range. This course continued will lead, as before, to within five-eighths of a mile of the lights, with Duxbury Pier Light-house bearing **W.** Thence the course is **W. $\frac{3}{4}$ N.**, following the directions previously given. These courses pass two miles to the eastward of Mary Ann Rocks and six hundred yards to the eastward of the black nun-buoy off the eastern end of Brown's Bank.

Coming from Wellfleet Harbor: When off the entrance, in five fathoms, with Billingsgate Light-house bearing **E. by N. $\frac{1}{2}$ N.**, six and a quarter miles distant, steer **NW. $\frac{1}{4}$ W.**, on which course Gurnet Point Light-houses will be in range when Manomet Point bears **SW. $\frac{3}{4}$ W.** Thence steer **NW.** for the lights until within five-eighths of a mile of them, with Duxbury Pier Light-house bearing **W.**, when steer **W. $\frac{3}{4}$ N.**, proceeding as before directed. These courses pass six hundred yards to the eastward of the black nun-buoy off the eastern end of Brown's Bank.

Coming from Provincetown: With Wood End Light-house bearing **NE. by E. $\frac{1}{4}$ E.**, three-quarters of a mile distant, in twenty-three fathoms water, steer **W. $\frac{3}{4}$ N.** across the bay until Gurnet Point Light-houses are in range on a bearing of **NW.**, five-eighths of a mile distant. On this position you will have nine fathoms and must steer **W. $\frac{3}{4}$ S.**, following the directions previously given.

Coming from the Southward, outside of Cape Cod.—Round Race Point to the northward and bring the light-house to bear **S SE.**, one mile and three-eighths distant, when you will have twenty-seven fathoms and must steer **W. $\frac{3}{4}$ S.** This course will lead up to the entrance, and if made good and continued will carry not less than four fathoms up to the black buoy on the dry part of Brown's Bank. Thence the course is **W. $\frac{3}{4}$ N.**, proceeding as before directed.

GENERAL REMARKS

FOR VESSELS BEATING INTO PLYMOUTH HARBOR.

In beating into Plymouth Harbor vessels should not stand into less than three fathoms on the northerly tack. On the southerly tack, the best guide is the rip on the edge of Brown's Bank, which can be plainly seen, except in very calm weather. Between Gurnet Point and Saquish Head a good rule is not to go to the northward of Duxbury Pier Light-house bearing **W. ¼ S.**

Should the lights be made in hard **N.** or **NW.** gales, so as to render it impossible to enter Plymouth Harbor,—Provincetown Harbor should be run for. To do this, bring Gurnet Point Light-houses to bear **W.** by **N.** and steer **E.** by **S.** until Wood End Light-house is visible. This is a *flashing red light* on the southern end of the Hook, and may be approached quite closely, the course leading within a mile of it. When up with it the directions for Provincetown Harbor must be followed. Should it blow so hard as to render it difficult to turn up the harbor, there is good anchorage off Long Point in clay bottom. The water is deep close to the shore, so that there is little risk of getting ashore unless the night be very dark.

LIGHT-HOUSES.

NAME.	Latitude.	Longitude West.			Fixed.	Height above sea-level.	Distance visible in nautical miles.	
		In arc.		In time.				
	° ' "	° ' "	h. m. s.			Feet.		
Plymouth or Gurnet Light-houses --- } Front Range ----- }	42 0 10	70 36 3	4	42	24	Fixed.	102	} 11 6
Duxbury Pier Light-house ----- }	41 59 13	70 38 56	4	42	36	Fixed.	40		11

TIDES.

Corrected Establishment	11 ^h 4 ^m
Mean Rise and Fall of tides	9.2 ft.
Mean Rise and Fall of Spring tides	10.8 ft.
Mean Duration of Rise	6 ^h 11 ^m
Mean Duration of Fall	6 ^h 14 ^m
Rise of highest tide observed	11.3 ft.

VARIATION OF THE COMPASS.

At Manomet Hill the magnetic variation was found, in January, 1872, to be **10° 42' W.**, with an annual increase of **3'** nearly; which would give for January, 1880, variation **11° 6' W.**

LIFE-SAVING STATIONS.

The United States Government has established on the western side of Gurnet Point, just above the light-houses, a life-saving station provided with all the appliances necessary for the relief of those who may be shipwrecked. There is also another station at Manomet Point, five miles below Plymouth Entrance, which is similarly provided, and is also under the control of the Government.

ICE IN PLYMOUTH HARBOR.

This harbor is obstructed by local ice on an average every other winter, but only for a few weeks, while the approaches are rendered hazardous (especially during January and February) by large masses of drift-ice, so that the Outer Harbor is unsafe as an anchorage. In severe winters, like that of 1874-75, ice begins to be an obstruction early in December, forming into a "field" and continuing solid until March,—during which time the harbor is closed to all navigation.

Neither the wind nor the tidal current seems to have any material influence on the movements of the ice.

WEST SHORE OF CAPE COD BAY FROM PLYMOUTH TO BARNSTABLE.

Long Beach, as before remarked, (see page 62,) runs **S.** by **E. ¼ E.** for two miles and a quarter, forming a natural breakwater to the Inner Harbor of Plymouth. Behind it to the westward appear the higher, undulating, wooded hills, with the town of Plymouth at their base. At its southern end the shore turns abruptly to the eastward for two miles and a quarter to **Rocky Point**,—thus forming a large cove called Warren's Cove, which has comparatively bold **Warren's Cove.** shores and affords excellent anchorage in southerly weather in from three to five fathoms, hard sandy bottom. The southern shore of Warren's Cove from the end of Long Beach to Rocky Point is hilly and for the most part well wooded, though the western portion is tolerably well cleared. The hills present steep precipitous faces of various heights towards the cove, and these are highest near Rocky Point. The point itself, however, is of moderate height, gently sloping, cleared at its eastern extremity, with one or two houses upon it, and backed by thickly wooded hills. From Gurnet Point, Rocky Point

bears **S. $\frac{1}{2}$ E.**, distant three miles and a quarter, which is here the width of the bight to which is often given the name of **Plymouth Bay**.

From **Rocky Point** to **Manomet Point** the general course of the shore is **SE.** and the distance two miles and a half. It varies in height and character, showing in some places steep wooded hills, and in others low lands partly sandy and partly grassy and in many places cleared and cultivated, but all backed by high and well-wooded hills. Of these

Manomet Point. hills the most conspicuous (and the first land made on approaching Cape Cod Bay from the vicinity of Boston) are the high lands back of **Manomet Point**, which are sometimes called **Manomet Hills**. **Manomet Point** shows an undulating surface with several houses upon it and almost entirely bare of trees. It is highest at its northern end, where is a somewhat steep hillock, and its sea-face, though low, is precipitous. It is faced by rocks, and should not be approached by strangers nearer than one mile on account of the numerous outlying ledges.

From **Manomet Point** the shore has a general direction **S. $\frac{1}{2}$ W.** to **Centre Hill Point**, three and three-quarter miles below. This is a low point, cleared near its eastern extremity, but backed by higher lands thickly wooded. Between **Centre Hill Point.** this point and **Manomet Point** the shore is all thickly wooded and of moderate height, except at **Indian Hill**, two miles and a quarter below **Manomet Point**. This hill is high, thickly wooded, and shows precipitous faces to seaward, and is consequently a prominent mark to vessels passing along this shore. This part of the coast should not be approached by strangers nearer than one mile, to avoid **Stellwagen Rock** and the shoals off **Centre Hill Point**,—these latter extending to the southeastward from the point for half a mile.

From **Centre Hill Point** the shore has a direction **SW.** by **S. $\frac{1}{2}$ S.** for a mile and a half, then turns to the westward for about half a mile, and then sweeps with a regular curve from **W.** to **SE.** by **S.** around to the entrance to **Sandwich**, nearly five miles below. The shore is for the most part thickly wooded, and faced by a sand beach, called **Scusset Beach**. **Sandwich Harbor.** as far down as **West Sandwich**, which is five miles and three-eighths below **Centre Hill Point** and one mile and three-eighths above **Sandwich Entrance**. Below **West Sandwich** the shore is all low and composed of marsh lands, dotted here and there with clumps of trees faced by sand beaches, and backed by higher lands, partly wooded and partly cleared, cultivated and settled. The village of **Sandwich** stands on the higher ground, five-eighths of a mile back from the beach. The entrance to **Sandwich Harbor** is extremely narrow,—passing between two stone piers or breakwaters,—and it cannot be entered except at high water, and then not without a pilot. The course from off **Manomet Point** to the entrance is **S. $\frac{1}{2}$ W.** leading up to the bar, where a pilot may always be obtained.

From **Sandwich Entrance** what is called **Spring Hill Beach** extends in a **SE. $\frac{1}{2}$ E.** direction for two miles and three-quarters, and is backed by low lands cleared, cultivated and settled. Thence the course is **E.** by **S. $\frac{1}{2}$ S.** for six miles to **Barnstable Entrance**, and the shore is for the most part composed of sand hillocks of various heights backed by marsh lands, and these again by low, gently sloping, cleared and cultivated grounds. **Scorton Neck,** which begins at the lower end of **Spring Hill Beach**, is the highest land on this part of the shore, is partly grassy, partly cultivated, has a few houses upon it, and is dotted at intervals with clumps of trees. It is joined at its southern end to **Sandy Neck**, which extends to **Barnstable Entrance**. This neck is composed entirely of sand, covered with sand hillocks, and dotted with occasional clumps of trees. At its eastern end it turns about **SE.** by **S.** for seven-eighths of a mile to **Beach Point**,—the northern point of entrance to **Barnstable Harbor**.

The whole of the shore from **Sandwich** to **Barnstable Entrance** is comparatively clean, and may be approached anywhere within half a mile with not less than four fathoms water. At **Beach Point**, however, there are extensive shoals making off to the northeastward for a mile and three-eighths.

BARNSTABLE HARBOR.

This harbor lies on the southern shore of Cape Cod Bay,—being situated nearly in the centre of the bight. Its entrance is in

Latitude ----- 41° 43' 19" N.
Longitude ----- 70° 16' 52" W.,

and is fifty-four miles **S. $\frac{1}{2}$ E.** from **Thatcher's Island Light-houses**, thirty-eight miles **S SE.** from **Minor's Ledge Light-house**, twenty-one miles **SE.** by **S. $\frac{1}{2}$ S.** from **Gurnet Point Light-houses**, and eighteen and a half miles **S.** by **W. $\frac{1}{2}$ W.** from **Race Point Light-house**. The harbor is formed by an arm of the bay, running nearly **E.** and **W.** for about three miles, between **Sandy Neck** and the main shore. The villages of **Barnstable**, **Yarmouth Port** and **Yarmouth** lie stretched in a line along its southern shore and to the eastward of it,—the harbor of **Yarmouth Port** being formed by a slue making in to the southward through the flats at the entrance to **Barnstable Harbor**, and which is dry at low water. Seven and a half feet is the best water that can be taken across **Barnstable Bar**, and it is not at all safe for strangers,—the channel being narrow and liable to shift during gales of wind.

The northern point of the entrance is formed by the southeastern point of **Sandy Neck** and is called **Beach Point**. It is low, flat and sandy, destitute of trees or grass, and carries on its southern end a white light-tower, known as **Sandy Neck Light-house**. The tower is forty-four feet high, and shows a fixed white light, of the fifth order of **Fresnel**, from a height of fifty-nine feet above the sea, visible thirteen miles. A covered way connects this tower with a white house with brown addition, occupied by the keeper. The bar-buoy bears from the light-house **NE.** by **N. $\frac{1}{2}$ N.** The geographical position of the light-house is

Latitude ----- 41° 43' 20" N.
Longitude ----- 70° 16' 52" W.

On the northern side of the harbor, and on the western side of Beach Point, makes in what is called The Cove,—a long light, almost entirely bare at low water, penetrating the southern shore of Sandy Neck for three-eighths of a mile. There are a few houses on its eastern shore, but the western shore is entirely composed of marsh, as is in fact the whole of the northern shore of Barnstable Harbor. The cove is half a mile wide at its mouth,—its western point, called **Mussel Point**, being that distance to the westward of Beach Point. On the western side of Mussel Point makes in what is called **Bass Creek**, also bare at low water and of no importance. The marshy island on the western side of its mouth is known as **Town Island**.

The Cove.

On the southern side of the harbor the shore is composed of low, nearly level lands, cleared and cultivated, dotted at long intervals with small groups of trees, with the thickly clustered houses of Barnstable and Yarmouth in the background. It is fringed with marsh, very shoal in its approaches, (large flats making off for about three-eighths of a mile,) and bare at extreme low tides.

A mile and five-eighths to the westward of the entrance to Yarmouth Port is Blish Point, a low marshy point, faced on the northern side by sand beach. Here also makes in a large and shallow creek, dry at low water,—one branch of which runs to the southward to the outskirts of the town of Barnstable. Blish Point is nearly opposite to Town Island. On the western side of the creek at Blish Point is another marshy point, behind which makes in a small stream called **Rendezvous Creek**, also dry at low water. Its western point of entrance, **Salten Point**, is another marshy point, backed by nearly level, cleared and settled lands. Hence the shore runs about W. by N. for a little over a mile to Calves' Pasture Point, which is at the head of the harbor proper.

Blish Point.

Calves' Pasture Point is low, undulating and cleared, has several houses upon it, and one large wharf and warehouse at its eastern end. On its northern side it shows somewhat precipitous faces at its eastern and western ends, with low, flat, level land between them. It is fringed with rocks and boulders. One-eighth of a mile to the northward of it is a marsh island known as **Huggins' Island**; and between it and the point makes in a large creek, bare at low water, penetrating **The Great Marshes**, which form the whole of the upper part of the harbor.

Calves' Pasture Point.

On the northern side of the harbor, between five and six hundred yards to the westward of Bass Creek, the shore takes a sudden turn to the northward,—running nearly due N. for three-eighths of a mile, and then nearly W. for seven-eighths of a mile to what is known as **Wells' Creek**, a small and shallow stream of no importance. The whole of the shore-line is marshy, and much cut up by small streams which penetrate the marsh in every direction. A group of marshy islands lies off this shore and extends over half way across the harbor. The northernmost, which is two hundred yards from the northern bank, is an islet two hundred yards long, known as **Tupper Island**. One hundred and twenty-five yards to the southward of it is **Great Thatcher Island**, which extends WNW. and ESE., and is over eight hundred yards long. Nearly two hundred yards to the westward of this is **Little Thatcher Island**, which lies W. by N. and E. by S., and is also eight hundred yards long. Its western extremity extends to the mouth of Wells' Creek and is one hundred and twenty-five yards from shore. Between these two islands passes what is known as **Thatcher Island Channel**,—a narrow slue leading up to Wells' Creek, and which is impassable except at high water, when it has not less than nine feet

Great and Little Thatcher Islands.

The southernmost of this group of marsh islands is called **Phillis' Island**, lies nearly E. and W., and is a quarter of a mile long. It is about four hundred yards to the southward of Great Thatcher Island and three hundred from Little Thatcher, and is joined to the latter by large flats, dry at low water, which also extend to the southward of this island to within three hundred and fifty yards of the southern shore of the harbor.

Phillis' Island.

Westward from these islands almost the entire harbor is occupied by immense flats dry at low water,—leaving only a narrow crooked channel, (called the **Black Bank Channel**), which runs along the western side of Phillis' and Little Thatcher islands in a NNW. direction towards Wells' Creek, and thence turns to the westward, following a winding course (sometimes under the northern shore and again in the middle of the harbor) to the mouths of **Great Creek** and **Spring Creek**, at which point the harbor of Barnstable terminates. About seven feet at low water will be found in Black Bank Channel as far up as Little Thatcher Island; but beyond this it is all shoal, having from one to four feet at low water up to the mouth of Great Creek.

DANGERS

IN APPROACHING AND ENTERING BARNSTABLE HARBOR.

In approaching this harbor the first obstruction met with is called **Barnstable Harbor Bar**, and is marked by a red spar-buoy (No. 2), placed in ten feet water, as an entering buoy. The bar has seven and a half feet upon it and is a third of a mile wide. The channel across it is about one hundred and twenty-five yards wide at its narrowest part, with dangerous flats of from one to four feet on both sides. When over the bar a black spar-buoy will be seen ahead and about five hundred yards off. This is on the northeastern extremity of the immense **Yarmouth Flats**, nearly all bare at low water, which obstruct the whole of the southern shore from Blish Point nearly to **North Dennis**, (a distance of four miles,) and which extend off to the northward, in the vicinity of the buoy, a mile and a quarter from shore. The buoy is placed in seven feet water close to their northeastern point, and is marked No. 1. No other part of the flats is buoyed; nor are the **Sandy Neck Flats**, on the western

Barnstable Harbor Bar.

Yarmouth Flats.

side of the channel, marked in any way, except by the rip upon them and by their being out at low water. It is therefore not safe for strangers to attempt to enter this harbor without a pilot.

The eastern side of Beach Point is quite bold-to and may be safely approached within fifty yards; but a *long shoal* makes off from its southern side for one hundred and fifty yards with less than six feet at low water. It is therefore necessary to give the southern side of the point a berth of about two hundred yards.

When past Sandy Neck Light-house it is necessary to look out for Horse-Shoe Shoal, the black spar-buoy on the southwestern end of which will be seen nearly in range with Salten Point and about three-eighths of a mile off. This shoal extends **NE.** by **E.** $\frac{3}{4}$ **E.** from the buoy for about five hundred yards,—its northeastern end bearing from the light-house **S.** by **W.** $\frac{3}{4}$ **W.**, one-eighth of a mile distant. There should be a buoy on this end of the shoal, as a vessel would be much more likely to run ashore here than at the western end. Part of the shoal is dry at mean low water and a large portion of it at low spring tides, but the shallowest part is close to the black buoy at the western end. The buoy is placed in twelve feet at low water, bears from Sandy Neck Light-house **SW.** $\frac{1}{2}$ **W.** three-eighths of a mile, and from the church steeple in Barnstable **NE.** by **N.**, one mile and a quarter distant.

After passing the Horse-Shoe the channel continues to the westward and is full of dangerous shoals and many boulders,—none of which are buoyed.

Five-eighths of a mile to the westward of the Horse-Shoe buoy is a long narrow shoal, nearly in mid-channel, called Moon Shoal. It is a quarter of a mile long in an **E.** and **W.** direction, and has from two to five feet upon it at mean low water. A small boulder near its western end, with three feet water, is called Pink Rock.

A great number of boulders,—some bare at low water and nearly all awash at low spring tides,—lie along the edges of the flats on both sides of the channel. A detailed description of them would be impossible, but a catalogue of their names and the depths of water upon them will be given in the order in which they are met after passing Horse-Shoe buoy.

I. *Baxter Rock*, on the southern side of the channel, with four and a half feet water, nearly half a mile **W SW.** from Horse-Shoe buoy.

II. *Lobster Rock*, awash, one hundred and fifty yards **S.** by **W.** from Baxter Rock.

III. *Pierce Rock*, with three and a half feet, a quarter of a mile to the westward of Baxter Rock and one hundred yards to the southward of Moon Shoal.

IV. *Pink Rock*, with three feet, near the western end of Moon Shoal.

V. *Channel Rock*, bare at low tide, two hundred yards **S.** by **W.** from Pink Rock.

VI. *Church Rock*, awash at mean low water, one hundred and fifty yards to the westward of Channel Rock.

VII. *Blind Rock*, on the northern side of the channel, four hundred yards **W.** by **N.** from the western end of Moon Shoal and three-eighths of a mile **SE.** $\frac{3}{4}$ **S.** from the eastern end of Phillis' Island. It has two and a half feet at mean low water.

VIII. *Tongue Rock*, awash at mean low water, nearly two hundred yards **W SW.** from Blind Rock, and also on the northern side of the channel.

IX. *A boulder with two feet*, about three hundred and fifty yards to the westward of Church Rock, and on the southern side of the channel.

X. *Red Rock*, three-eighths of a mile to the westward of Church Rock and one hundred and fifty yards from the southern shore of the harbor, and has two and a half feet at mean low water.

XI. *Flying Fish Rock*, also on the southern side, one hundred yards **W.** from Red Rock, with two feet at mean low water.

XII. *Cone Rock*, bare, about three hundred and fifty yards to the westward of Flying Fish Rock, and nearly in the middle of the channel.

XIII. *Triangle Rock*, with two feet, a few yards to the northward of Cone Rock.

XIV. *Hickens' Rock*, one hundred and fifty yards **W.** by **N.** from Triangle Rock and three-eighths of a mile **W.** from Tongue Rock. It is on the northern side of the channel and on the eastern side of the entrance to Black Bank Channel, and has two feet at mean low water.

XV. *A boulder with one foot water*, fifty yards **W.** from Hickens' Rock.

XVI. *A dry rock*, two hundred and fifty yards **W.** from Triangle Rock.

XVII. *Seudder Rock*, bare, fifty yards **NW.** from the last-mentioned rock and one hundred and fifty yards **W.** $\frac{1}{4}$ **S.** from Hickens' Rock.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING BARNSTABLE HARBOR.

From the above list of obstructions it will be readily seen how nearly impossible it would be for a stranger to enter this harbor,—at least to pass beyond Sandy Neck Light-house without a pilot. Besides, the numerous banks of light sand which form the bar are subject to great and sudden changes.

during violent gales. There also appear to be gradual alterations continually going *Sailing Directions--Barnstable Harbor.* on under the action of tidal currents. Only general directions can therefore be given, and the best advice that can be given a stranger is, when up with the bar, to take a pilot.

Coming from the Northward: When Manomet Point bears SW. $\frac{3}{4}$ W., two miles and a quarter distant, in sixteen fathoms, the course for the bar-buoy is SE. by S. $\frac{1}{2}$ S.,—the soundings shoaling gradually to the outer edge of the bar.

From off Race Point the course is S. by W. $\frac{1}{4}$ W., but, coming from the northward, the shore should not be approached in less than five fathoms water until Sandy Neck Light-house bears SW. by S. $\frac{1}{4}$ S., when the red buoy on the bar will be seen,—the course passing to the eastward of it close-to; and when up with it a S. by W. $\frac{1}{2}$ W. course will lead for the black buoy on Yarmouth Flats, crossing the bar in seven and a half feet at mean low water. When abreast of the buoy, in seven and a half feet, with Sandy Neck Light-house bearing SW. $\frac{1}{4}$ W., steer for the light, carrying not less than eight and a half feet, until within three hundred yards of Beach Point and in four fathoms water, when it is necessary to haul to the southward so as to clear the point,—the course being about S SW.,—and carrying not less than four fathoms water until Sandy Neck Light-house bears NW. by W. $\frac{1}{4}$ W., distant three hundred and fifty yards; when a W. $\frac{1}{2}$ S. course will lead safely by the point with not less than eight and a half feet water, and good anchorage may be found in two fathoms with the light bearing NE. by N. $\frac{1}{2}$ N., distant one-eighth of a mile. From this point the course to clear the black buoy on the Horse-Shoe is SW. $\frac{1}{2}$ W., but no stranger should attempt to pass above the anchorage just mentioned.

The above directions are given merely for the benefit of strangers who may be obliged by sheer necessity to cross the bar. Whenever a pilot can be obtained one should always be taken. Besides, as the bar is apt to shift it is not safe to rely upon the above directions unless compelled so to do by necessity.

GENERAL REMARKS

FOR VESSELS INTENDING TO ENTER BARNSTABLE HARBOR.

After crossing the bar coming in, it is necessary to be careful that the courses are made good if the tide be flood, as the current of flood sets strongly on to Yarmouth Flats.

If unable to round Beach Point, safe anchorage may be found in from three to six fathoms with the light bearing SW.

It cannot be too strongly impressed upon strangers that this is a shifting bar, and that the courses cannot be relied upon for any length of time. The above courses were good for 1879. It is necessary to take a pilot, and one can nearly always be obtained.

LIGHT-HOUSE.

NAME.	Latitude.	Longitude West.		Fixed or Revolving.	Height above sea-level.	Distance visible in nautical miles.
		In arc.	In time.			
Sandy Neck Light-house	41 43 20	70 16 52	4 41 8	Fixed.	59	13

TIDES.

Corrected Establishment	11 ^h 22 ^m
Mean Rise and Fall of tides	9.3 ft.
Mean Rise and Fall of Spring tides	9.8 ft.
Mean Rise and Fall of Neap tides	8.8 ft.
Mean duration of Rise	6 ^h 10 ^m
Mean duration of Fall	6 ^h 15 ^m
Rise of highest tide observed	11.0 ft.

VARIATION OF THE COMPASS.

The magnetic variation in January, 1872, was found to be 10° 56' W., with a present annual increase of 3'. This would make the variation for 1880, 11° 20' W.

SOUTH SHORE OF CAPE COD BAY FROM BARNSTABLE TO HERRING RIVER.

To the eastward of Yarmouth Port the shore has a general course about **NE. by E.** for two miles,—being composed entirely of marsh lands backed by nearly level fields cleared and well settled. It is intersected by many small streams of which two only are worthy of mention, viz: **Lone Tree Creek**, which runs in the direction of Yarmouth from a point about half a mile to the northeastward of Yarmouth Port. It is dry at low water and is used only by small boats. Secondly, **Chase Gardner's Creek**,—the entrance to which is a mile and a quarter beyond Yarmouth Port and three-quarters of a mile to the eastward of Lone Tree Creek. Salt-works are scattered along the eastern edge of the marsh, and the wind-mills attached to them give this part of the shore a peculiar appearance.

On the northern side of Chase Gardner's Creek begins a sand beach dotted with hillocks and backed by marsh, upon which stand a number of wind-mills. These low lands continue for a mile and a quarter to the eastward, and then the shore takes a turn, first **E. by N. $\frac{1}{2}$ N.** for two miles, and then **E. $\frac{1}{2}$ N.** for eight miles to **Rock Creek**, passing the villages of **North Dennis, East Dennis and Brewster**. The shore, though sometimes irregular in outline, has no indentations of importance, and although comparatively bold-to in the vicinity of North Dennis, (where three fathoms may be found within a quarter of a mile,) it should not be approached to the eastward of that village nearer than a mile and a half. The lead is a good guide in keeping vessels off this shore, as it shoals gradually up to the six-foot curve.

The general appearance of the coast is much like that in the vicinity of Barnstable,—being composed of comparatively low lands somewhat undulating, for the most part cleared and thickly settled, and backed by thickly-wooded hills.

To the eastward of the village of Brewster it is lower and nearly level, and marsh lands again appear, extending to **Rock Creek** and thence in a **NNE.** direction for a little over a mile to **Herring River**. There is a small settlement on the banks of **Rock Creek**, but none of these small streams are of any importance. On both sides of the creek there are extensive salt-works with wind-mills attached.

From **Herring River** the shore runs **N. $\frac{1}{2}$ E.** for three miles and a half to the entrance to **Wellfleet Harbor**, passing the village of **Eastham**, which is situated a little over two miles to the northward of the river and about three-quarters of a mile back from the beach. Here the Hook of the Cape is only about two miles and a half wide,—**Nauset Beacons** being situated a mile and three-quarters **E.** from the village.

The western shore is undulating, mostly cleared, low, dotted here and there with sand hills and small clumps of trees. It is a straight shore, but foul, and cannot be closely approached by vessels drawing over six feet water.

WELLFLEET HARBOR

is situated on the western side of the Hook of Cape Cod, near its southern end, and is a very comfortable anchorage for vessels of light draught. Its entrance is between **Wood Beach** on the east and **Billingsgate Island** on the west, and is two and three-quarter miles wide, gradually contracting in width to **Mayo's Beach** at its head,—four and a quarter miles above the entrance,—where it is only a mile wide; and here a narrow arm makes in to the northward from the eastern side of the cove up to the village of **Wellfleet**, which is built upon its northern and western shores. This arm or creek is entirely dry at low water,—the usual anchorage being under **Billingsgate Island** or anywhere in the channel between that island and **Mayo's Beach Light-house**.

At the eastern side of the entrance is, as before mentioned, what is known as **Wood Beach**, which is three and a third miles to the northward of **Herring River**. It is simply a small strip of sand beach surrounded by marsh on two sides, and lies on the southern bank of a large but shallow cove called **Hatch Creek**, which leads up to **Brook Village**,—a small settlement near the eastern shore of the cape,—and its shores are all marshy. On its northern side lies an island, composed partly of marsh and partly of steep sand hills, called **Horse Island**. The hills on this island are bare of trees but grassy, and are steep and bold on the north side. The island itself is about a mile long in an **E. and W.** direction, and forms the southern side of the entrance to **Black-Fish Creek**,—a large but shallow stream leading up to **South Wellfleet**. It is almost entirely dry at low water and is of no importance. The shores are sand hillocks and marsh about equally divided, but all backed by steep wooded hills.

On the western shore of the harbor, at the entrance, lies **Billingsgate Island**, a low sandy islet, triangular in shape and fringed with sand hillocks from fifteen to twenty feet high. It is surrounded in every direction by dangerous shoals and flats, many of which are bare at low water,—so that it cannot be approached except from the **Billingsgate Island and Light-house** harbor side. On its southeastern extremity is built the light-house which is the guide to **Wellfleet Harbor**. **Billingsgate Island Light-house** is a red tower thirty-four feet high, with black lantern, and shows a fixed white light, of the fourth order of Fresnel, from a height of fifty-two feet above the sea, visible thirteen miles. There is no fog signal. Its geographical position is

Latitude 41° 52' 16" N.
Longitude 70° 4' 9" W.

About a quarter of a mile to the southward of **Billingsgate Island**, but connected with it at low water, is a low sandy islet about a quarter of a mile long,—a little to the southeastward of which will be seen a black spar-buoy. The courses pass to the eastward of it. To the northward of **Billingsgate Island** dry shoals extend for a mile to a long, low, sandy point making off from the base of a high, bare sand hill called **Great Beach Hill**. The point is called **Great Beach Point**, and is almost exactly opposite to the mouth of **Black-Fish Creek** on the eastern side of the harbor.

Just to the northward of Great Beach Hill is what is known as **Great Island**, also composed of somewhat steep sand hills and entirely bare of trees. It is connected with Great Beach Hill on the south and **Griffin Island** on the north by very narrow strips of sand beach; and forms the southern side of the entrance to a large but shallow stream, forming the western arm of the harbor, and called **Herring River**. (This river must not be confounded with the other of the same name a mile above Rock Creek, at the southeastern extremity of Cape Cod Bay.) Its entrance is exactly opposite to the entrance of the **Inner Harbor of Wellfleet**.

On the eastern shore of Wellfleet Harbor, above Black-Fish Creek, the land is composed of bare sand hillocks interspersed with cleared fields, and gradually rising, as it recedes to the eastward, to steep wooded hills.

The northern shore of the harbor from **Union Wharf**, at the mouth of Herring River, to **Mayo's Beach** is composed of the usual sand hills, with low lands here and there, backed by marsh and faced by a flat sand beach. Salt-works also occupy this part of the shore to the westward of **Mayo's Beach**. The beach itself is simply a flat, level strip of sand backed by marsh, which extends to the northwestern point of the entrance to the **Inner Harbor**. About one-quarter of a mile from its eastern end stands **Mayo's Beach Light-house**. The lantern is on the keeper's dwelling, which is painted white. It is thirty-six feet above the sea, and shows a fixed white light, visible eleven miles. There is no fog-signal. Its geographical position is

Latitude ----- 41° 55' 48" N.
Longitude ----- 70° 2' 4" W.

About four hundred yards to the eastward of **Mayo's Beach Light-house**, and near the western point of entrance to the Inner Harbor, is a long wharf with a warehouse on the end of it.

DANGERS

IN APPROACHING AND ENTERING WELFLEET HARBOR.

The first danger met with in approaching this harbor is called **Billingsgate Shoal**, which extends from the southern point of **Great Island** (called **Little Beach**) about **SW.** by **W.** for five miles and from **Billingsgate Island W.** by **S. ½ S.** for five miles and a half. The soundings upon it vary from one to twelve feet, but it is in some places bare at low water. Excellent anchorage is afforded in northerly gales, under the southern side of this shoal, in from three to eight fathoms for vessels which have fallen to leeward of Provincetown and been unable to get into that harbor. On the eastern point of the shoal, in twelve feet water, is placed a black spar-buoy, marked **No. 1**. For one mile and an eighth to the westward of it soundings vary from fifteen to sixteen feet, and vessels of large draught, in running for shelter, should not therefore approach this buoy nearer than one mile and a half. In beating to windward it is not safe to stand to the northward farther than to bring this buoy to bear **W. ¾ S.**, or, when the buoy has been lost sight of, the southern end of the small sand island south of **Billingsgate Island** to bear **E. ¾ N.** But when near this islet a vessel drawing over six feet water must not approach it nearer than seven hundred yards, as there are dangerous flats making to the southward which have from two to three feet water upon them.

*Billingsgate
Shoal.*

When past the spar-buoy on the end of **Billingsgate Shoal** there are no dangers for a vessel drawing twelve feet water until up with **Bibb Rock**, which has six feet upon it, lies four miles and a half **E.** by **S. ½ S.** from the spar-buoy on **Billingsgate Shoal** and two miles and a half **S. ¼ E.** from **Billingsgate Island Light-house**. It is a detached rock, and is marked by a spar-buoy painted red and black in horizontal stripes, placed in ten feet water, sandy bottom, on its northeastern side. The sailing-lines pass to the westward and northward of this buoy, but there is good anchorage in from three to four fathoms **SE.** from it from a quarter to three-quarters of a mile distant.

Bibb Rock.

When past **Bibb Rock**, a black spar-buoy will be seen a little to the westward of the course bearing about **NE. ¼ E.** and distant about a mile. This is on **Billingsgate Flat**, which makes off from the southern side of the island in a **SE.** by **S. ¼ S.** direction from the light-house,—its extreme southeastern end being a mile and one-third distant. The buoy is marked **No. 3**, and is placed in eight feet water on the end of the shoal. Vessels entering the harbor must pass to the eastward of it, close-to.

*Billingsgate
Flat.*

When abreast of the black buoy on **Billingsgate Flat** the course turns to the northward and there will be seen ahead, a little to the westward of the course and about a mile and a quarter off, a red spar-buoy. This is on the western edge of a flat called **The Middle Ground**, which extends from **Horse Island** a mile and a half towards the light-house,—occupying nearly the whole width of the passage. The buoy is marked **No. 2**, is placed in fifteen feet water on its western end, and bears from **Billingsgate Island Light-house NE.** by **E. ¼ E.**, distant nine hundred yards. The course passes to the westward of the buoy on **The Middle Ground** and turns abruptly to the northeastward, on which course a black spar-buoy will soon appear about a

*The Middle
Ground.*

mile off and bearing about **NE**. This is on Smalley's Bar, which makes off from Great Beach Hill and Great Beach Point to the eastward for a mile, and is in many places dry at low water. The buoy is marked No. 5, and is placed in twelve feet water on the southeastern extremity of the shoal, and the course passes to the eastward of it, close-to. When abreast of it the course turns more to the northward, leading directly for Mayo's Beach Light-house; and there are no more dangers met with until within about a mile of the light-house, when there will be seen, to the westward of the course and well inshore, a dry rock, called **The Old Sow**. The Old Sow, and sometimes **Egg Island Rock**, which may be passed on either hand by vessels going into Herring River, and bears from Mayo's Beach Light-house **W SW.**, distant three-quarters of a mile. It is not in the way of vessels going into Wellfleet.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING WELLFLEET HARBOR.

It must be premised that no one should attempt to enter this harbor, or to pass beyond Bibb Rock, without a pilot. Strangers may, however, make a comparatively comfortable anchorage under Billingsgate Shoal should they fall to leeward of Provincetown Harbor in northerly gales. Under such circumstances, for a vessel drawing not over ten feet, Wood End Light-house should be brought to bear **N. $\frac{1}{2}$ E.**, and a **S. $\frac{1}{2}$ W.** course thence will lead half a mile to the westward of the black spar-buoy on the western end of Billingsgate Shoal, and across the tail of that shoal in sixteen feet water. When just past the buoy, or when Billingsgate Island Light-house bears **E. by N. $\frac{1}{2}$ N.**, with sixteen feet water, **E. by S. $\frac{1}{2}$ S.** will lead safely, and with not less than sixteen feet, to the anchorage **SE.** of Bibb Rock. On this course anchorage may be found when Billingsgate Island Light-house bears **N. $\frac{3}{4}$ W.**, in from three and a half to three and three-quarter fathoms, hard bottom. *Or, wishing to anchor under the shoal:* When Billingsgate Island Light-house bears **E. by N. $\frac{1}{2}$ N.**, as before, the course is **E. $\frac{3}{4}$ S.**, carrying not less than fourteen feet across the shoal, and having from four to six fathoms after crossing it. On this course good and comparatively smooth anchorage will be found, with the light-house bearing **NE. $\frac{3}{4}$ E.**, distant three miles—the depth being from four to five fathoms. But the **E. $\frac{3}{4}$ S.** course may be continued, crossing the southern point of the flats in sixteen feet water, until Billingsgate Island Light-house bears **N. by E. $\frac{3}{4}$ E.**, with a depth of five fathoms, when anchorage may be found in from three to four fathoms by hauling up for the light and continuing that course for from half to three-quarters of a mile.

But vessels of large draught, and all vessels if the sea be very heavy, should bring Wood End Light-house to bear **N. by E. $\frac{1}{8}$ E.**, when the course will be **S. by W. $\frac{1}{8}$ W.**, which course will lead two miles outside of the black spar-buoy on the western end of Billingsgate Shoal. On this course, when in four and three-quarter fathoms, with Billingsgate Island Light-house bearing **E. by N. $\frac{1}{2}$ N.**, the course is **E. by S. $\frac{3}{4}$ S.**, carrying not less than three and a half fathoms, until the light-house bears **N NE.** The depth will be three and a half fathoms, and the course thence, to the anchorage to the southward of Bibb Rock, is **E. $\frac{3}{4}$ N.**, carrying not less than three and a quarter fathoms. Anchorage may be found anywhere with the light bearing **N. $\frac{3}{4}$ W.**

Or, wishing to anchor under Billingsgate Shoal: When in four and three-quarter fathoms off the western point of the shoal, with Billingsgate Island Light-house bearing **E. by N. $\frac{1}{2}$ N.**, as before, the course is **E. $\frac{1}{4}$ S.**, carrying not less than four fathoms, until the light-house bears **NE. $\frac{3}{4}$ E.**, when the course leads directly for it, and vessels may anchor at discretion in from three to five fathoms about two miles and a half from the light. *Or,* the course **E. $\frac{1}{4}$ S.** may be continued, crossing the southern point of the flats in eighteen feet water, until Billingsgate Island Light-house bears **N. by E. $\frac{3}{4}$ E.**, two miles and a quarter distant. The depth will be five fathoms, and good anchorage will be found in from three to four fathoms by hauling up for the light and continuing the course for about half a mile.

Coming from the vicinity of Race Point and intending to anchor under Billingsgate Shoal, a vessel of light draught should bring Race Point Light-house to bear **N. $\frac{1}{4}$ W.**, when the course will be **S. $\frac{1}{4}$ E.**, which course will lead half a mile outside of the black spar-buoy on the western end of Billingsgate Shoal, crossing the tail of the shoal in sixteen feet water. On this course, when Billingsgate Island Light-house bears **E. by N. $\frac{1}{2}$ N.** the depth will be sixteen feet, and the course thence is **E. by S. $\frac{1}{2}$ S.** for the anchorage **SE.** of Bibb Rock, as before, or **E. $\frac{3}{4}$ S.** for the anchorage under Billingsgate Shoal, following the directions given above. It may be remarked here that these courses will not serve for vessels drawing over ten feet unless the tide be high.

WELLFLEET HARBOR.

Vessels of large draught should get Race Point Light-house to bear **N. $\frac{1}{4}$ E.**, *Sailing Directions--Wellfleet Harbor.* when the course will be **S. $\frac{1}{4}$ W.**, which course will lead two miles outside of the black spar-buoy on the western end of Billingsgate Shoal and in four and three-quarter fathoms water. When the light-house bears **E. by N. $\frac{1}{2}$ N.**, as before, the course is **E. $\frac{1}{4}$ S.** for the anchorage under Billingsgate Shoal, or **E. by S. $\frac{3}{4}$ S.** for the anchorage under Bibb Rock,—following the directions given above.

Coming from the vicinity of Plymouth: When Manomet Point bears **SW. $\frac{3}{4}$ W.**, two miles and a quarter distant, the course is **SE. $\frac{1}{4}$ E.**, which will lead two miles outside of the black spar-buoy on the western end of Billingsgate Shoal and in four and three-quarter fathoms. On this course, when the light-house bears **E. by N. $\frac{1}{2}$ N.** the course is **E. by S. $\frac{3}{4}$ S.**, carrying not less than three and a half fathoms, if bound for the anchorage south of Bibb Rock, or **E. $\frac{1}{4}$ S.** for the anchorage under Billingsgate Shoal, carrying not less than four fathoms, until the light bears **NE. $\frac{3}{4}$ E.** and the depth is five and a half fathoms, when the light should be steered for, anchoring in from three to five fathoms two miles from it.

If necessity compels and no pilot can be obtained, (a very rare case indeed,) the harbor of Wellfleet may be entered by a vessel drawing eight feet or less by observing the following directions: The two courses from off Billingsgate Shoal (**E. $\frac{3}{4}$ S.** for light-draught vessels and **E. $\frac{1}{4}$ S.** for large vessels) unite in five fathoms, with Billingsgate Island Light-house bearing **N. by E. $\frac{3}{4}$ E.**, two miles and a quarter distant. From this point the course is **NE. $\frac{1}{2}$ E.** for about a mile and five-eighths, carrying not less than ten feet, until the light-house bears **NW. by N. $\frac{3}{4}$ N.**, a mile and a quarter distant. This will lead up to the black spar-buoy on Billingsgate Flat, passing it in nine feet at low water. Hence the course is **N.** for one mile and a half until the light-house bears **SW. $\frac{3}{4}$ W.**, nearly three-quarters of a mile distant, and carrying not less than ten feet water. This course leads up to the red buoy on The Middle Ground, and when past it (with the above bearing of Billingsgate Island Light-house) **NE. $\frac{1}{4}$ N.** should be steered, carrying not less than three and a half fathoms, until up with the black spar-buoy off Smalley's Bar. Passing to the eastward of this buoy the course is **NNE.** for Mayo's Beach Light-house, carrying to within three-eighths of a mile of the light not less than eight feet water. Good anchorage may be found anywhere along the above courses after passing Billingsgate Island Light-house.

In beating to windward care must be taken not to approach the southern side of Billingsgate Shoal too closely, as it is quite bold-to,—shoaling from four fathoms to ten feet very quickly. A good rule is not to go to the northward of the black spar-buoy on the western end of the shoal bearing **W. $\frac{3}{4}$ S.**, or (when the buoy has been lost sight of) the southern end of the small sand island to the southward of Billingsgate Island bearing **E. $\frac{3}{4}$ N.** But a vessel drawing over six feet water must not approach this islet nearer than seven hundred yards, as there are dangerous flats making to the southward which have from two to three feet water upon them.

LIGHT-HOUSES.

NAME.	Latitude.	Longitude West.		Fixed or Revolving.	Height above sea-level.	Distance visible in nautical miles.
		In arc.	In time.			
Billingsgate Island Light-house	41 52 16	70 4 9	4 40 17	Fixed.	52	13
Mayo's Beach Light-house	41 55 48	70 2 4	4 40 8	Fixed.	36	11

TIDES.

Corrected Establishment	11 ^h 5 ^m
Mean Rise and Fall of tides	11.2 ft.
Mean Rise and Fall of Spring tides	11.8 ft.
Mean Rise and Fall of Neap tides	10.6 ft.
Mean duration of Rise	6 ^h 7 ^m
Mean duration of Fall	6 ^h 12 ^m
Rise of highest tide observed	13.9 ft.

ATLANTIC COAST PILOT.

CURRENTS.

The observations of currents were made as far as practicable when the influence of the wind was small. The drift is in nautical miles per hour; the direction of the set by compass. The site of observation was a quarter of a mile **W.** from the black spar-buoy on Billingsgate Flat.

LOCALITY.	First Quarter.		Second Quarter.		Third Quarter.		Flood or Ebb.
	Set.	Drift.	Set.	Drift.	Set.	Drift.	
West of Billingsgate Flat buoy-----	NE. by E. $\frac{1}{4}$ E. SW. by W. $\frac{1}{4}$ W.	0. 30 0. 25	NE. by E. ----- WSW. -----	0. 40 0. 35	NE. $\frac{1}{4}$ E. ----- WSW. -----	0. 40 0. 20	Flood. Ebb.

VARIATION OF THE COMPASS.

The magnetic variation at Wellfleet was, in January, 1872, $11^{\circ} 19' \text{ W.}$, with a present annual increase of $3'$ nearly. This would give for 1880, variation $11^{\circ} 43' \text{ W.}$

PROVINCETOWN HARBOR.

From Great Beach Point the western shore of the Hook has a general course **N. $\frac{1}{4}$ E.** for six miles to the mouth of Pamet River. It is composed almost entirely of sand hillocks of moderate height, intersected occasionally by marsh lands, is well settled, and backed by thick woods. Pamet River is a shallow stream bordered by marsh, and runs nearly across the whole width of the Hook in an easterly direction. The Hook is here only two miles and three-quarters wide. There is a small settlement on the southern bank of the river called **Pamet River Village.** From Pamet River the shore runs **N. $\frac{1}{4}$ W.** in a straight line for nearly two miles to **Pond Village**, a small settlement on the west shore just above the Highlands. It is lower than the land to the southward of the river and the hills are not so abrupt; and to the northward of the village the shores are nearly level, covered only with grass, and backed by the high sand hills which form the eastern face of the cape.

Provincetown Harbor is a semi-circular cove formed by a turn in the northern end of the Hook of Cape Cod and has a diameter of about two miles. Its entrance is three miles to the northward of Pond Village and about eleven miles above Billingsgate Island Light-house, and is contained between the western shore of the Hook and a long sandy point known as Long Point, which forms the southeastern extremity of the point of the Hook. This harbor is one of the best on the Atlantic Coast,—being of sufficient capacity for large fleets and having anchorage in from three to ten fathoms with excellent holding-ground. Hundreds of coasters and fishermen find shelter here during every northerly gale.

In approaching this harbor the northwestern point of the Hook is first passed. This is called Race Point, and is the northernmost extremity of Cape Cod. The point itself is a mere low, flat sand beach, but there are innumerable sand hillocks on both sides of it with steep faces to seaward, and dotted here and there with scrubby trees. At the pitch of the cape rises a group of high, brown sand hills, destitute of trees and sloping precipitously to the beach. On Race Point is built the light-house which marks the eastern point of entrance to Cape Cod Bay, and is called Race Point Light-house. It is an iron tower, thirty-five feet high, painted red, with a black lantern on top, and is built on a hillock a little way back from the beach, about sixteen feet above sea-level. It shows a fixed white light, of the fourth order of Fresnel, (varied by flashes at intervals of one minute and a half,) from a height of fifty-one feet above the sea, visible twelve miles. Its geographical position is

Latitude ----- $42^{\circ} 3' 43'' \text{ N.}$
Longitude ----- $70^{\circ} 14' 36'' \text{ W.}$

About one hundred yards **NNE.** from the light-house is placed the house containing the **fog-signal**, which is a twelve-inch steam fog-whistle, giving blasts of four seconds' duration, with alternate intervals of eight and forty-four seconds.

From Race Point a long and very narrow strip of sand extends in a **SE. by S.** direction for nearly three miles and a half to Wood End,—the southernmost point of the Hook. This part of the shore is nothing but sand, faced by a beach with somewhat steep slopes, and backed by barren rolling plains and high, steep, wooded sand hills. At Wood End this narrow strip of sand (which forms the western breakwater to Provincetown Harbor) is covered with sand hillocks and has upon it a low brick tower, painted dark brown and shaped somewhat like a pyramid, which shows a flashing red light, of the fifth order of Fresnel, from a height of forty-five feet above the sea. This light flashes once every fifteen seconds and is visible in ordinary weather twelve miles. The tower is built upon a small hillock, about eleven feet high, close down to the beach, and the keeper's dwelling, which is a low wooden house, painted cream color, is placed about fifty feet to the northeastward of it. There is no fog-signal. The geographical position of Wood End Light-house is

Latitude ----- $42^{\circ} 1' 15'' \text{ N.}$
Longitude ----- $70^{\circ} 11' 37'' \text{ W.}$

From Wood End the shore turns to the northeastward and runs with a gentle curve about **NE. by E. $\frac{1}{4}$ E.** for one mile and an eighth to Long Point, the western point of entrance to Provincetown, as well as the southern point of the Hook. It is a low

sandy shore, composed for the most part of flat beach backed by somewhat higher sandy land, with a number of salt-works upon it surrounded by small houses. It is comparatively bold-to, and may be approached anywhere within three hundred and fifty yards by the largest vessels until up with **Long Point Bar**, which begins about three-eighths of a mile below Long Point and extends to the eastward about a quarter of a mile. Long Point is low and sandy, and has on its extremity two small sodded earth-works near the light-house, which is the local guide to Provincetown Harbor. In passing the light-house vessels should keep about a third of a mile to the eastward to avoid the bar. But on its northern side it is very bold-to, and may be approached within two hundred yards with twelve fathoms water. Long Point Light-house is built upon the extremity of the point, and is a square brick tower, painted brown, with black lantern on top. A little to the southward of the tower will be seen the keeper's dwelling, which is a small frame building, painted straw color. The light is a fixed white light of the fifth order, shown from a height of thirty-seven feet above the sea, and visible eleven miles. Its geographical position is

Long Point and Light-house.

Latitude 42° 1' 58" N.
 Longitude 70° 10' 8" W.

A short distance to the northward of the light-house will be seen the bell-tower containing the fog-bell, which is struck by machinery, and gives, during thick and foggy weather, first, two blows in quick succession, followed by an interval of thirty seconds, and then a single blow, followed by the same interval.

Provincetown occupies the northwestern shore of the harbor,—being situated at the base of the high steep hills which form this shore, and extending up their slopes. The hills back of the town are sufficiently remarkable, being high, steep and sandy, some wooded, some bare, and some covered with scrub.

The eastern and northern shores of the harbor are much lower than the western shore, and are composed of slightly undulating lands with steep sea-faces, bare of trees and covered mostly with grass. There are also occasional hills rising above the general level, some of which have a few trees upon them, and these characteristics the country keeps over to the Highlands.

In the northern part of the bight there is an opening about a quarter of a mile wide and crossed by a bridge, which leads into a wide but very shallow basin known as **East Harbor**. It has an average width of about half a mile for about seven-eighths of a mile above its mouth, and then gradually contracts to a mere brook,—terminating only about a quarter of a mile from the eastern shore of the cape at the northern extremity of the Highlands,—thus nearly cutting the cape in two. East Harbor is nearly all bare at low water and entirely so at low spring tides. Its general course is about **E SE.**, but it has many windings and curves, especially in its narrower parts. Its southern shore is formed by a long but very narrow strip of sand beach, separating it from Provincetown Harbor, and off this beach the water is shoal for over half a mile.

DANGERS

IN APPROACHING AND ENTERING PROVINCETOWN HARBOR.

Race Point may be approached with safety by the largest vessels within six hundred yards, and the shore to the southward of it within the same distance, until near Shank-Painter Bar, which makes off from the beach about one mile and a half below Race Point, or almost exactly midway between that point and Wood End. It extends half a mile from shore and is not dangerous to vessels of light draught, as it has from fourteen to sixteen feet water upon it five hundred yards from the beach. **Shank-Painter Bar.**

Wood End may be approached with safety by the largest vessels within three hundred and fifty yards, and the same may be said of the shore to the eastward of it for three-quarters of a mile, or until within three-eighths of a mile of Long Point. Here it is necessary to look out for Long Point Bar, which makes out to the eastward from Long Point for between five and six hundred yards, has nine feet upon it an eighth of a mile from the beach, and is marked by a black spar-buoy (No. 1) placed on its southern extremity. To avoid it vessels should keep about a third of a mile to the eastward of the point when passing it. **Long Point Bar.**

The northern shore of Provincetown Harbor should not be approached nearer than seven-eighths of a mile by large vessels, as the flats make off from that shore nearly three-quarters of a mile, and there is a shoal spot with fourteen feet water one mile **NE. ½ N.** from Long Point Light-house.

So also the *Truro shore*, in standing across on the port tack, beating into the harbor, should not be approached nearer than a mile in the vicinity of Pamet River and five-eighths of a mile near Pond Village.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING PROVINCETOWN HARBOR.

It is best to pass about two miles to the westward of Race Point, and when the light-house bears **E.** at that distance, the depth will be twenty-eight fathoms, and the course **SE.** by **S. ½ S.**, carrying not less than nineteen fathoms, until Highland Light-house opens to the southward of Wood End and bears **E. ½ N.**, when Wood End Light-house will bear **E.** by **N. ¼ N.**, distant nearly two miles, and

Sailing Directions--Provincetown Harbor. the depth will be nineteen fathoms. The course is now **E. $\frac{1}{4}$ N.** for Highland Light-house, carrying not less than seventeen fathoms, until Wood End Light-house bears **W NW.**, seven-eighths of a mile distant, and Long Point Light-house **N NE.**, the same distance. The depth will be seventeen fathoms, and the course **NE. Easterly** for one mile and a quarter, carrying not less than fifteen fathoms, until Long Point Light-house bears **W. $\frac{1}{2}$ S.**, half a mile distant; when the course is **NW. $\frac{1}{4}$ N.**, carrying not less than ten fathoms for half a mile, or until Long Point Light-house bears **SW.** by **S. $\frac{1}{4}$ S.** The depth will be eleven and a half fathoms and the course **W.**, with not less than nine fathoms, to the anchorage. In approaching the anchorage it is not safe to go to the westward of Long Point Light-house bearing **SW.** by **W.**, as the beach on the western side of the harbor is abrupt and shoals rapidly from nine fathoms to twelve feet.

The **NW. $\frac{1}{4}$ N.** course may be continued and good anchorage found in from three to five fathoms about a quarter of a mile from the wharf-line of the town; and in fact it is not necessary to give any particular course for a safe anchorage after passing Long Point Light-house, unless a vessel be of the largest draught, when it is best to follow the directions given above.

With **NE.** winds, care should be taken to keep close in along Long Point and stand well over towards Truro on the port tack, so as to make the anchorage on the other tack. Or, good anchorage in from five to ten fathoms may be found by continuing the **E. $\frac{1}{4}$ N.** course towards Highland Light-house and anchoring at discretion.

Coasters are accustomed to pass about five-eighths of a mile from Race Point Light-house, and when it bears **E.**, with a depth of twenty-eight fathoms, to steer **SE.** by **S. $\frac{1}{2}$ S.**, carrying not less than eighteen fathoms, until Wood End Light-house bears **E.** by **N. $\frac{1}{8}$ N.**, with Highland Light-house open, as before, on a bearing of **E. $\frac{1}{4}$ N.** They then steer for Highland Light-house until Long Point Light-house bears **NE.** by **N. $\frac{3}{8}$ N.**, with seventeen fathoms water, and follow the directions given above.

LIGHT-HOUSES.

NAME.	Latitude.	Longitude West.			Fixed or Revolving.	Interval of Flash.	Height above sea-level.	Distance visible in nautical miles.
		In arc.		In time.				
	° ' "	° ' "	h. m. s.			m. s.	Feet.	
Race Point Light-house	42 3 43	70 14 36	4 40 58		F. V. F.	1 30	51	12
Wood End Light-house	42 1 15	70 11 37	4 40 49		Flg. red.	0 15	45	12
Long Point Light-house	42 1 58	70 10 8	4 40 41		Fixed.		37	11
Cape Cod, or Highland Light-house.	42 2 21	70 3 39	4 40 15		Fixed.		195	20

TIDES.

Corrected Establishment	11 ^h 22 ^m
Mean Rise and Fall of tides	9.2 ft.
Mean Rise and Fall of Spring tides	9.9 ft.
Mean Rise and Fall of Neap tides	8.5 ft.
Mean duration of Rise	6 ^h 15 ^m
Mean duration of Fall	6 ^h 10 ^m
Rise of highest tide observed	12.5 ft.

VARIATION OF THE COMPASS.

The magnetic variation for 1872, for the month of January, was **11° 58' W.**, with an annual increase of **3'** nearly; which will give for 1880, variation **12° 22' W.**

LIFE-SAVING STATIONS.

The United States Government has established in the vicinity of Provincetown the following life-saving stations:

- I. At Race Point Light-house.
- II. At Peaked Hill Bar.
- III. One mile N. of Highland Light-house.

These are all provided with boats and other necessary appliances for saving life.

PROVINCETOWN HARBOR

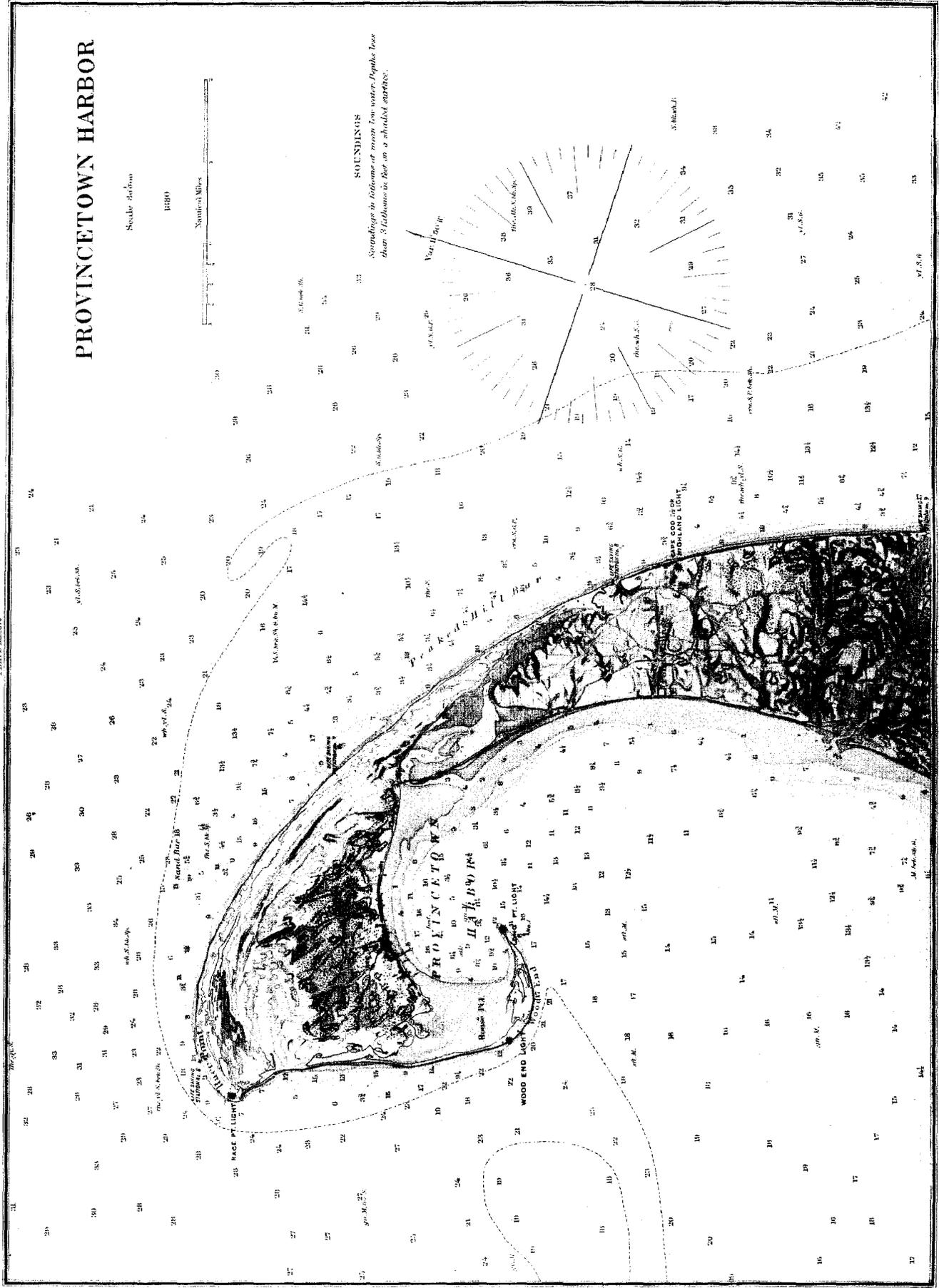
Scale fathoms

1880

Nautical Miles

SOUNDINGS

Soundings in fathoms at mean low water. Depths less than 3 fathoms are here on a shaded surface.



ICE AND ITS EFFECTS IN CAPE COD BAY.

As a rule this bay is unsafe during the winter, owing to the great quantities of drift-ice which, being driven out of the rivers and harbors of Massachusetts Bay, masses into heavy floes and drives down upon the southern and eastern shores of Cape Cod Bay. During very severe winters the ice "packs," and, in some cases, (as for example in 1875,) extends as far from the southern shore as a line from Wood End to Sandwich,—thus closing Barnstable, Wellfleet and Provincetown harbors,—and attains the extraordinary thickness of eighteen feet. This impassable barrier remains until the return of spring; and navigation of all kinds is of course suspended. In these extreme cases, which are fortunately rare, vessels caught in the floes have been known to drift helplessly about with the pack until released by the warmer weather and consequent breaking up of the ice at the commencement of spring.

The Keeper of Billingsgate Island Light-house reports that, during the winter of 1874-'5, he counted as many as forty floes of drift-ice at one time outside of the island; not one of them being less than ten feet, and many being as high as twenty feet out of water. This immense thickness of floating ice was no doubt due to the immense pressure of the field-ice outside, which forced the cakes one upon another, as we see frequently in "ice-gorges" in our rivers.

Ice was also, during the same winter, forced upon the south shores, and piled up in some places to a height of twenty or thirty feet,—some of the masses measuring eighteen feet in thickness.

The prevailing NW. winds are the cause of the presence of most of the "drift" and "pack" ice, as they bring it from Boston and other harbors west of Cape Ann; and there being no outlet to Cape Cod Bay, the ice masses together and increases in thickness and extent. Northeasterly winds, on the contrary, tend to break up the pack; while those from E. to SW. prevent formations and remove any that may have taken place.

The tidal current, so far as ascertained, seems to have little or no effect upon the movements of the ice,—unless it may be that the "coast current" (discovered by Professor Mitchell of the Coast Survey) in the vicinity of Sandwich may be the cause of that particular portion of the bay being free from any large masses of ice even in the severest winters. This current has a northerly course for about eleven hours out of twelve, and a maximum velocity of three-quarters of a mile. Its temperature, as determined by Professor Mitchell, corresponds very nearly with that obtained from considerable depths at stations only a few miles distant. It seems reasonable, also, to suppose that as the current is a "sub-stratum of the sea," its temperature does not undergo any remarkable changes in consequence of changes in atmospheric temperature, and thus remains during cold weather considerably above that of the surrounding water. Future investigations will probably throw additional light on this subject.

Provincetown Harbor.—This harbor is closed by ice only in very severe winters,—but two occurrences of the kind having taken place within the recollection of those now living. In the winter of 1856-'7 the ice filled the harbor for two or three days, and in 1875 the blockade lasted from February 8th until March 1st. In this latter year the pack, which extended across Cape Cod Bay, was forced across the harbor entrance, and thus favored the formation of local ice inside, so that in two days the whole harbor was sealed up, and so continued until the pack at the entrance broke up—when the harbor-ice quickly followed it.

As a rule, when ice packs across the entrance to Provincetown Harbor it requires for its removal winds from NE. around the northward to NW.,—unless, as above mentioned, the pack extends over the whole bay and is heavy enough to resist the sea caused by such winds. In such cases the pack must first be broken up along the southern shores of the bay by southerly or southeasterly winds; and then, if these be followed by strong northerly or northeasterly winds, the harbor will soon be cleared.

Winds from S. to SW. have a tendency to force the drift-ice from the bay into the harbor; but these winds are of rare occurrence during the winter months.

EAST COAST OF CAPE COD FROM RACE POINT TO MONOMOY.

At Race Point the shore curves to the northward and then to the eastward, running about E. $\frac{1}{4}$ N. for three miles and three-eighths; when it again turns and takes a course about SE. by E. for four miles. Thence to the Highlands the course is SE. $\frac{1}{4}$ S., and the distance one mile. All of the east coast from Race Point to the Highlands is composed of bare sand hillocks of various heights and destitute of trees. On approaching the Highlands, however, (the light-house on which forms a very conspicuous object—see view,) the sand hills begin to be covered with a brownish-looking growth of grass and the land is higher. The pitch of the cape at this point shows a high sand bluff with steep almost perpendicular faces and level summit, on which stands the white light-tower, surrounded by several small houses. In coasting the beach several huts of refuge and life-boat stations are seen; and just to the northward of the light-house is the signal-station,—a wooden tower with flag-staff on top. Vessels passing this station can communicate with Boston by using Rogers' "Marine Signals."

Highland Light-house is a brick tower fifty-five feet high and whitewashed, which stands on the summit of the hill, at a height of one hundred and forty feet above the sea. It shows a fixed white light, of the first order of Fresnel, from a height of one hundred and ninety-five feet above the sea, visible twenty miles, and is one of the principal sea-coast lights of the Atlantic Coast. There is here, near the light-house, a first-class Daboll fog-trumpet, giving blasts of eight seconds at intervals of half a minute. The geographical position of the light-house is

Highland or Cape Cod Light-house.

Latitude ----- 42° 2' 21" N.
 Longitude ----- 70° 3' 39" W.

Highland Light-house bears from

	Miles.
Cape Ann (Thatcher's Island) Light-houses, S SE.	42
Boston Light-house, SE. $\frac{1}{4}$ E.	41
Minot's Ledge Light-house, SE. by E.	34
Cape Elizabeth Light-houses, S. $\frac{1}{4}$ W.	92
Monhegan Light-house, SW. by S. $\frac{1}{4}$ S.	108

Abreast of the light-house the character of the bluffs changes from yellow to reddish sand; and the whole of this part of the coast is a series of precipitous sand bluffs, slightly varying in height, with a narrow strip of sand beach at the base. Here and there green hollows filled with scrub or covered with grass are seen, and, occasionally, a thick grove of trees in the back-ground. The shore is comparatively clean, and may be approached anywhere within five-eighths of a mile with four fathoms water, except when about two miles to the eastward of Race Point, when it will be necessary to look out for a dangerous shoal called The Sand Bar, with from five to eleven feet water, which makes off from the beach in a NW. $\frac{1}{4}$ N. direction for one mile. Its northern end bears from Race Point Light-house NE. by E. $\frac{1}{4}$ E., distant two miles and five-eighths. Highland Light-house bearing SE. $\frac{1}{4}$ E., or Race Point Light-house SW. $\frac{1}{4}$ W., clears this shoal to the eastward and northward.

At the Highlands the shore is quite steep-to and may be safely approached within seven hundred yards, but the water shoals somewhat abruptly, and care must be taken not to go inside of four fathoms.

From the Highlands to Nauset Beacons, twelve miles below, the shore has a general course S. by E., is tolerably clean and without a break,—being composed, as before, of steep almost perpendicular sand cliffs of various heights.

Nauset Beacons. The Nauset Beacons will appear, when seen from the northward, as three low white towers perched upon the summit of a steep sand cliff, with a couple of small houses close to them. (See view.) They are each twenty feet high, and show fixed white lights, of the fourth order of Fresnel, from a height of ninety-three feet above the sea, visible eleven miles. Their geographical position is

Latitude	41° 51' 37" N.
Longitude	69° 57' 4" W.

Abreast of the Nauset Beacons the set of the tidal current changes and runs in the opposite direction to its course while to the northward of them,—the flood setting now to the southeastward, (and to the eastward in Vineyard Sound,) whereas to the northward of the latitude of the beacons it sets to the westward. To the southward of the lights the coast turns very gradually to the southward,—running about S. $\frac{1}{4}$ W. to Chatham, nine miles and a half below. It gradually becomes lower, less steep and undulating, slopes gently back from the beach, and is covered with a scanty growth of thin grass. A few houses appear at long intervals.

Four miles below Nauset Beacons is the entrance to **Eastham** or **Weeset Harbor**. A long, narrow and winding inlet makes in to the northward, and branches to the southwestward into what is called **Town Cove**, upon the southern shore of which are situated the small settlements of **Weeset** and **Tonset**. **Eastham**, however, is inland, a mile and three-quarters to the northward of the head of the northern branch. This inlet is of little importance, as it has less than six feet at low water, with a shifting sand bar; and it is not used except by fishermen and coasters of light draught who are perfectly familiar with its dangers. Vessels sometimes anchor close in to the shore off this entrance, when bound to the westward through the Sounds and met by heavy westerly winds. The depth at the usual anchorage is from four to six fathoms, "coarse white sand, with yellow and black specks."

From Highland Light-house to near Chatham Entrance the coast is somewhat steep-to,—not less than three fathoms being found at a distance of a quarter of a mile, and in many places six fathoms. **Eastham Entrance** may be known by the thickly clustered houses in Weeset and Tonset, which appear on the summit of **The Ridge**,—a rising ground somewhat higher than the land to the northward. As this ridge extends to the southward it increases a little in height, forming a smooth grassy hill with perpendicular faces, crowned with a cluster of houses and faced by a broad, flat sand beach. The entrance is nearly abreast of the houses, but is not distinguishable until close to it on account of the land behind it.

Hence to Chatham the coast shows first a low sandy shore covered with small hillocks and backed by higher lands, on the summits of which houses are in many places thickly clustered. Five miles and a half below **Eastham Entrance** is the site of the former northeastern entrance to Chatham, now closed. The opening in the beach, however, remains, but does not communicate with Chatham, but with **Pleasant Bay** to the northward of it. A line of breakers in ordinary weather stretches across the

entrance at low water, and a long bar makes out to the eastward for three-quarters of a mile, which is known as **Chatham Bar**, a misnomer at present, as the real **Chatham Bar** is off the southern entrance to the harbor, in Nantucket Sound. Off the eastern extremity of this bar, in six fathoms water, is placed a "Whistling Buoy," which is sounded by the motion of the sea and gives blasts at short intervals. The buoy is painted red and bears from Chatham Light-house E. $\frac{1}{4}$ N., one mile and three-quarters distant. Here begins **Nauset Beach**, which extends in a SW. by S. direction for four miles and a half to what is called **Old Harbor**, and is composed of a succession of low sand hillocks, with occasional strips of flat beach, over which the sea breaks in heavy weather. Immediately opposite the lights there was, in 1873, a very low strip of sand, over which the sea broke in heavy weather with such violence as to render the harbor untenable. In fact, constant breaches are being made across the beach; so that **Chatham Harbor** is now rarely used,—vessels preferring to anchor for shelter in northerly winds in what is known as **Chatham Roads**, (to the southwestward of the lights,) or, if they be of light draught, in **Old Stage Harbor**, on the western side of **Morris Island**.



Highland Light

Here Pt. Light
Rog. Ball

Cape Cod from the Northward, Highland Light bearing SE. 1/2 S, distant 8 Miles.



Highland Light, bearing West, distant 2 1/2 Miles.



Nantuxet Peacocks, bearing West, distant 3 Miles.

In passing along Nauset Beach the town of **Chatham** is seen over it,—the most conspicuous objects being the two light-houses known as **Chatham Light-houses**. These are two circular iron towers, painted white, one hundred feet apart and forty-three feet high, standing one on either side of a white dwelling-house. They are **N. and S.** from each other, and show fixed white lights, of the fourth order of Fresnel, from a height of eighty feet above the sea, visible fourteen miles. Their geographical position is

Latitude ----- **41° 40' 15" N.**
Longitude ----- **69° 57' 0" W.**

The entrance to Old Harbor is entirely closed and full of sand shoals and sandy islets; but in 1873 there was a cut made by the sea across Nauset Beach, just below the town, through which four feet at low water could be carried, with an average **rise and fall** of four and a half feet. Chatham Harbor, however, is inaccessible to strangers and to all vessels of over six feet draught. It is unnecessary, therefore, to give any special description of it or of the anchorage therein.

A short distance to the southwestward of the southern end of Nauset Beach, and nearly joined to it at low water, is a long narrow island called **Monomoy Island**, which extends to the southward four miles and a half, and forms the northern side of the entrance to Nantucket Sound. It appears as a low, barren and sandy island, covered with innumerable sand hillocks, and lies about **SSW. and NNE.** Its eastern shore is foul,—having many sand bars off it; but vessels sometimes anchor off this shore in from four to six fathoms, and wait for a fair tide to beat through the Sounds. The most easterly of these shoals lies on the southern side of the entrance to Old Harbor, about a mile and a half below the north end of the island and three-quarters of a mile from shore. It is called **Schooner Bar**, has nine feet at lowest tides, and its eastern extremity bears from **Monomoy Point Light-house NE. ½ N.**, two miles and a half distant. As a general rule it is best not to approach the shore nearer than a mile after passing **Chatham Light-houses**.

The southern end of **Monomoy Island** is called **Monomoy Point**; and nearly one mile above its southern extremity stands the light-house which marks the northern point of entrance to Nantucket Sound. This light-house is called **Monomoy Point Light-house**, and is a cast-iron tower, painted red, thirty feet high, connected by a covered way with a white dwelling-house, and showing a fixed white light, of the fourth order of Fresnel, from a height of forty-one feet above the sea, visible twelve miles. There is no fog-signal. The geographical position of the light-house is

Latitude ----- **41° 33' 32" N.**
Longitude ----- **69° 59' 38" W.**

This and the **Chatham Light-houses** serve as guides to vessels going through the North Channel between **Monomoy Point** and **The Handkerchief**, and thence between **Point Gammon** and **Bishop and Clerk's Shoal**. The bearing of **Monomoy Point Light-house NW.** by **W. ½ W.** leads clear of **Pollock Rip** going in or out. From this light-house **Great Point** or **Nantucket Light-house** bears **SSW. Westerly**, distant ten and a half miles, and the light-house on **Bishop and Clerk's Shoal W.** by **N. ½ N.**, distant eleven and a half miles.

LIFE-SAVING STATIONS ALONG THE EAST SHORE OF CAPE COD.

As this is an exceedingly dangerous coast, life-boat stations and huts of refuge have been established by the U. S. Life-Saving Service, as follows:

- I. **Peaked Hill Bar Station**, on the beach abreast of **Peaked Hill Bar**.
- II. **Highland Light Station**, situated about one mile **N.** of the light-house, back of the beach, and has one boat.
- III. **Pamet River**.—About four miles **S.** from **Highland Light-house** is a surf-boat, and there is also another surf-boat at this station belonging to private parties.
- IV. **Cahoon Hollow**.—About two miles and a half **S.** from **Pamet River Station** is a hut of refuge and small surf-boat.
- V. **Nauset Beach**.—About one mile **S.** of the three lights is a surf-boat under the care of the light-keeper.
- VI. **Orleans Beach**.—At this point, **S.** of **Eastham Entrance**, there is a surf-boat.
- VII. **Chatham Station**.—A short distance **S.** of the lights there is another surf-boat.
(This part of the beach is fast wasting away, and is liable to be broken through by any heavy northeast gale with high tide.)
- VIII. **Monomoy Point Station**.—Here there is a Government life-boat and one surf-boat,—the latter being near the light and under the care of the light-keeper.

NANTUCKET SOUND.

This Sound, which is the common thoroughfare for coasting vessels between **New York** and **Boston**, is bounded on the north by the mainland of **Massachusetts** which forms the southern shore of **Cape Cod**; on the east is the **Atlantic Ocean**; on the south the island of **Nantucket**; and on the west **Martha's Vineyard**. Within these boundaries it is about eighteen miles in diameter, and has wide channels with water sufficient for the largest vessels; but it is full of shoals and dangers. At its western extremity it is connected with **Vineyard Sound**, which leads between a line of islands making off from the southwestern end of **Cape Cod** and the northern and western shores of **Martha's Vineyard**.

The northern point of the entrance to **Nantucket Sound** from the eastward is **Monomoy Point**, (already described,) while the southern point is the northeastern extremity of **Nantucket Island**, called **Great Point**.

Nantucket Island is of irregular shape, lies nearly **E. and W.** and is about fifteen miles long. It is widest at its eastern end, where, from **Great Point** to the southeastern point of the island, the distance is nearly ten miles; but it gradually diminishes in

width from this to the westward, until at Matacut Harbor it is only a mile and three-quarters wide, and at its western extremity (abreast of Tuckernuck Island) it is a mere strip of sand about two hundred and fifty yards wide. Its surface is hilly and undulating, diversified with woods and cleared slopes, with many high, steep sand cliffs on the northern side.

Nantucket Island. On the southern side, however, the land, though undulating, is low and sandy and for the most part bare of trees,—though occasional clumps of trees appear, particularly in the neighborhood of Siasconset and Ten Never's Head. But little of either shore of Nantucket is seen by vessels entering the Sound,—those which come in through Butler's Hole seeing nothing but Great Point, and that only on clear days; and those which come in by the Main Channel having but an indistinct view of the higher portions of the eastern and northern shores. A detailed description of the north shore of this island will be found under the head of Nantucket Harbor.

Nantucket Island is surrounded by shoals,—those especially which lie to the eastward of it making it one of the most dreaded parts of the coast. These shifting sand shoals, which extend in a southeasterly direction from the southeastern end of the island, have various depths upon them, ranging from six feet to four fathoms, and change their positions more or less after every heavy gale. The outermost shoal, which is known as Phelps' Bank, lies forty miles **SE.** by **S** from

Nantucket Shoals. Sankaty Head Light-house, the bearing being taken from the ten-fathom spot known as Asia Rip, on the southern end of the bank. The most easterly of the shoals proper is called Fishing Rip, and lies about twenty-seven and a half miles to the southeastward of the southeastern end of the island and ten miles to the northward of Phelps' Bank. It has four fathoms and breaks heavily in strong winds. The southernmost of the shoals is called Davis' South Shoal, lies twenty miles **S. ½ E.** from Sankaty Head Light-house, and has eight feet water. A light-vessel showing two reflecting lights is placed nearly three miles **S SE.** from the shoalest part, in about fourteen fathoms water, and marks the turning point of the outside channel, which crosses the shoals in not less than five and a half fathoms water.

Coasters rarely pass outside of Nantucket,—the Sounds offering a shorter, safer and more convenient thoroughfare;—while on the contrary, vessels engaged in foreign trade, or belonging to foreign nations, seldom, if ever, pass through the Sounds. To such vessels, therefore, Nantucket Shoals are a source of great dread and anxiety; as the shifting nature of the sands, the velocity and bewildering set of the currents, and the little reliable information obtainable as to their set and drift all tend to confuse a seaman if, by the accident of thick weather or otherwise, he should find himself entangled among them. A full description of, and directions for, the outside routes from Boston to New York, will be found in a thorough discussion of these shoals, (given hereafter,) with directions for crossing or for avoiding them, together with such information relative to the Currents as is at present available.

Great Point, the northeastern point of Nantucket Island and the southern point of the entrance to the Sound, is long, low and sandy, bare of trees, and backed by flat wooded lands, which form the northern shore of the inner harbor of Nantucket. A long and dangerous shoal called **Great Point Rip** makes off from this point to the eastward. About six hundred yards to the southward of the extremity of the point is built the light-house, commonly known as Nantucket Light-house, a stone tower sixty feet high, whitewashed, and connected by a covered way with a white dwelling-house. It shows a fixed white light, of the third order of Fresnel, from a height of seventy feet above the sea, visible fourteen miles. There is no fog-signal. The geographical position of the light-house is

Latitude 41° 23' 22" N.
Longitude 70° 2' 45" W.,

and it bears from

	Miles.
Monomoy Point Light-house, S SW. Westerly	10 ½
Pollock Rip Light-vessel, SW.	10 ½
Shovelful Light-vessel, SW. by S. ½ S.	9 ½
Handkerchief Light-vessel, S. ½ W.	6
Bishop and Clerk's Light-house, SE. by S. ½ S.	14 ½
Cross Rip Light-vessel, SE. by E. ½ E.	11 ½

Seven miles and three-eighths **S.** by **E. ½ E.** from Nantucket Light-house stands another light-tower, on the eastern extremity of the island. This is called Sankaty Head Light-house, and is perched upon the summit of the steep sandy cliff of that name,—the most remarkable feature of the eastern shore of the island. The tower is white except in the middle, where there is a broad red band, and shows a fixed white light, of the second order, varied every minute by a brilliant flash of ten seconds' duration. The tower is sixty-five feet high, and the light is shown from a height of one hundred and fifty feet above the sea, visible nineteen miles. Its geographical position is

Latitude 41° 16' 59" N.
Longitude 69° 57' 55" W.,

and it bears from

	Miles.
Monomoy Point Light-house, S. ½ W.	16 ½
Pollock Rip Light-vessel, S. by W. ½ W.	15 ½
Chatham Light-houses, S. by W. ½ W.	23 ½
Davis' South Shoal Light-vessel, N. ½ W.	22 ½
Cape Sable, (the southwestern end of Nova Scotia,) WSW.	232
Mount Desert Rock Light-house, SW. Southerly	180
Matinicus Rock Light-houses, SW. by S. ½ S.	158

NORTH SHORES OF NANTUCKET SOUND.

Monomoy Island, as before mentioned, lies about **NNE.** and **SSW.**, and extends to the northward nearly to the southern extremity of Nauset Beach. Large shoals and dry flats lie off its western shore, obstructing the approaches to Chatham Roads, Stage Harbor and Chatham Harbor, but they are not in the way of vessels passing through the Sound.

Chatham Roads lie at the northeastern end of Nantucket Sound, in the bight formed between the southern shore of Cape Cod and the dry shoals to the northward of Monomoy Island, and afford good anchorage in northerly and easterly gales. The northern shore extends from **Harding's Beach Point** first, **NW. $\frac{1}{2}$ N.** for a mile and five-eighths, and then about **W.** for a mile and a quarter to the mouth of **Red River**, a very small and shallow stream, upon which is built the village of **South Harwich**. Thence to Herring River (the entrance to West Harwich) the northern shore of the Sound runs **W. $\frac{1}{2}$ N.** for four miles, and is for the most part low and sandy, with perpendicular faces, covered with sand hillocks and backed by woods. In other places the land is gently sloping, grassy, and of moderate height. The distinctive features of this shore are not usually visible to vessels passing through the Sound, but only its general outline; although the thickly-clustered white houses in the different villages along its course are, on clear days, prominent objects. It is shoal in its approaches and should be avoided by strangers.

Chatham Roads.

On **Harding's Beach**, six miles to the northward of Monomoy Point Light-house and about five-eighths of a mile to the westward of the extremity of **Harding's Beach Point**, stands the light-house which is the guide to the anchorage in Chatham Roads and into Stage Harbor. It is called **Harding's Beach Light-house**, and shows a fixed white light, of the fourth order of Fresnel, from a height of forty-five feet above the sea, visible twelve miles. The tower is thirty five feet high and is painted red—the lantern black. The keeper's dwelling is painted white, and stands about fifty feet to the southward of the tower. The geographical position of this light-house is

Harding's Beach Light-house.

Latitude 41° 39' 30" N.
Longitude 69° 59' 2" W.,

and it bears from **Bishop and Clerk's Light-house E. by N. $\frac{1}{2}$ N.**, a little over thirteen miles distant.

Herring River is a very small and shallow stream upon which is built the village of **West Harwich**, and from its mouth the course of the shore is **W. $\frac{1}{2}$ N.** for two miles to **Swan Pond River**,—the land presenting the same appearance as that to the eastward, being low and sandy, with steep faces alternated with flat beach, dotted with sand hillocks and backed by woods. From **Swan Pond River** the shore runs **W. $\frac{1}{2}$ N.** for a mile and five-eighths to the entrance to **Bass River**,—a narrow, crooked and shallow stream of little importance—but off the entrance to which is a tolerably good roadstead for vessels of light draught.

The shore between **Swan Pond** and **Bass** rivers is a low, flat beach, dotted with hillocks and backed by marsh and woods. The village of **West Dennis** is situated about midway between the two rivers, and three-quarters of a mile back from the beach. The dangerous **Kill Pond Bar** extends off from this shore, rendering it unsafe to approach it nearer than one mile and three-quarters.

From **Bass River** the north shore has a general course **W. by S. $\frac{1}{2}$ S.** for about three miles, when it turns nearly **SW.** for about one mile, forming the eastern shore of **Point Gammon**. From **Bass River** to **Parker River** (a mile and a quarter to the westward) this shore is all wooded, and is plainly visible to vessels using the **North Channel**; but at **Parker River** marsh lands faced by beach begin, and continue to the westward for about a mile. Thence to **Point Gammon** stretches a low sandy shore covered with hillocks backed by cleared and level lands, and these again by thick woods. **Parker River** is a very small and narrow stream running between marshy banks to a large pond back of **Yarmouth**, in which it takes its rise.

Point Gammon is a sandy bluff head of moderate height, with yellow precipitous faces and level summit crowned with a thick line of low trees. A white tower and dwelling on its southern end mark the site of the old light-house, which has been for some years discontinued. Shoals make off from the point, and it should not be approached from the eastward nearer than a mile and a half, or from the southward nearer than half a mile. This point forms the eastern point of entrance to **Hyannis Roads** and **Lewis Bay**. **Lewis Bay** is a wide but shallow bay of irregular shape, the northwestern arm of which runs to the town of **Hyannis**, but is not available, even for the smallest vessels, except at the top of high water.

Point Gammon.

Hyannis Roads lie to the westward of the entrance to the bay—being embraced between **Point Gammon** on the east and **Hyannis Point** on the west. The anchorage is partly sheltered from southerly winds by a breakwater,—a mass of stone loosely thrown together and about four hundred yards long. Its direction is **NW. by W.** and **SE. by E.**, and the eastern end was, in 1873, three-quarters of a mile **SSW.** from the light-house, and it is believed that it has not since been extended.

Hyannis Roads.

Hyannis Light-house is situated close to the beach, in the middle of the bight forming the roadstead, and is a low white tower, standing close to the keeper's dwelling on a smooth level point with precipitous sandy faces. It is twenty-one feet high and shows a fixed red light from a height of forty-two feet above the sea, visible twelve miles. The geographical position is

Hyannis Light-house.

Latitude 41° 38' 9" N.
Longitude 70° 17' 19" W.

About half a mile to the westward of this light-house is the small settlement of **Hyannis Port**, where there is a large railroad wharf; and about a mile to the westward of this is **Hyannis Point**, which lies between **Hyannis Roads** and **Centreville Harbor**. When viewed from the southward it will appear as a smooth, grassy hill, higher

Hyannis Point.

than any of the adjacent country, and terminating to the northwestward in a high sandy bluff joined to the point by a strip of low land. Its summit and southwestern side are covered with houses, most of them summer-cottages, included within the limits of Hyannis Port.

Vessels using the North Channel through the Sound will, when about five miles from Point Gammon, perceive, a little to the westward of their course and about three miles off, a grey stone tower with open-work bell-tower attached to its western side, giving it a peculiar appearance which renders it unmistakable. It will appear as if standing in the water, but on approaching it closely it will be seen to stand upon a mass of dry rocks, which form part of the **Bishop and Clerk's Shoal**, on the southern side of this channel. This light-house is called **Bishop and Clerk's Light-house**, and shows a white light, flashing once every thirty seconds, from a height of fifty-nine feet above the sea, visible thirteen miles. Its geographical position is

Latitude ----- $41^{\circ} 34' 25''$ N.
Longitude ----- $70^{\circ} 15' 1''$ W.,

and it bears from

	Miles.
Point Gammon Tower, S. $\frac{1}{2}$ E. -----	2 $\frac{1}{2}$
Monomoy Point Light-house, W. by N. $\frac{3}{4}$ N. -----	11 $\frac{1}{4}$
Handkerchief Light-vessel, NW. $\frac{1}{4}$ W. -----	10 $\frac{1}{4}$
Nantucket Light-house, NW. by N. $\frac{3}{4}$ N. -----	14 $\frac{1}{4}$
Cross Rip Light-vessel, NE. by N. $\frac{1}{2}$ N. -----	7 $\frac{1}{2}$

The fog-bell is struck by machinery once every fifteen seconds in foggy weather.

On the western side of Hyannis Point there makes in to the northward a large semicircular cove two and a quarter miles wide at its mouth and with from twelve to nineteen feet in it at low water. It is known as **Centreville Harbor**, and its entrance is easily recognized, when seen from the southward, by the high, blue, wooded hills in the back-ground, in front of which stretches a long, low, flat island, faced by white sand beach. In the middle distance, between the beach and the hills, the tall steeple and thickly clustered houses of **Centreville** will appear. The harbor of Centreville is, properly speaking, only a roadstead, being open to southerly winds; but, though rarely used, it has good water (from fifteen to twenty feet at the anchorage) and fine holding-ground. The shores are low and sandy, dotted with sand hillocks and backed by thick woods.

From **Deadneck Point** (the western point of entrance to Centreville) the north shore of the Sound runs to the westward for about two miles and a half to the entrance to **Osterville Harbor**. It is low, sandy, faced by beach, backed by thick woods, and there are a few houses scattered along its length. **Osterville Harbor** is a long inlet of irregular shape, crooked and shallow, and its width at the entrance is much diminished by two low sandy islets lying across its mouth. The village of **Osterville** occupies nearly all of the eastern shore at the head of the harbor, while the settlement of **Cotuit Port** occupies the western shore from the entrance to a mile above its mouth. This western shore is composed of level lands, thickly settled, and backed by woods, while the eastern shore is mainly formed by the thickly wooded lands of **Osterville Grand Island**. This harbor is unfit for strangers, and is resorted to only by the small fishermen who belong there.

From **Osterville Entrance** the shore runs to the southwestward for about five-eighths of a mile to a narrow inlet, a little over two hundred yards wide, leading into **Poponesset Bay**. This is a wide but shallow bay, unfit for strangers, which extends to the northward about a mile and an eighth, between level lands diversified with woods and cleared fields and showing low sandy faces. The narrow inlet which leads into it makes in a nearly W. by S. direction into the southeastern part of the bay and has an average width of one hundred and fifty yards. At its head **Poponesset Bay** receives the waters of two shallow streams,—the easternmost of which, called **Cotuit River**, has a general course NE. $\frac{1}{4}$ N. for a mile and a half to the back of **Cotuit Port**; while the other, called **Marshpee River**, runs nearly N. for one mile and an eighth. Neither is of any importance.

The southern point of the inlet leading into **Poponesset Bay** is low and sandy, covered with sand hillocks and bare of trees. Thence the shore runs SW. $\frac{1}{4}$ W. for two miles and a half,—being for the most part thickly wooded and faced by a white sand beach. It then turns to the westward with a gentle curve, running first W. by S. $\frac{3}{4}$ S. for half a mile; then W. $\frac{1}{4}$ S. for three eighths of a mile; and then W. $\frac{1}{4}$ N. for a mile and three-eighths to the entrance to **Waquoit Bay**. This shore is all sandy, level, and thickly wooded. The northern shore of **Nantucket Sound** terminates at **Succonesset Point**, three and a quarter miles to the southwestward of **Poponesset Entrance** and one mile and a half to the eastward of **Waquoit Bay**. It is not safe to approach this point from any direction on account of the extensive shoals which make off from it.

VINEYARD SOUND,

as before mentioned, (see page 81,) is bounded on the north by the southwestern portion of **Cape Cod** and the line of islands called the **Elizabeth Islands**, which extend from it to the westward from **Nobska Point** to **Cuttyhunk**; and on the south by the island called **Martha's Vineyard**. It joins **Nantucket Sound** on a line between **Succonesset Point** on the north and **Cape Pog** (the eastern extremity of **Martha's Vineyard**) on the south; and between these two points is about eight miles wide, but rapidly contracts in width until, at **West Chop**, (the northern extremity of the **Vineyard**,) it is only about three and a half miles wide.

and keeps about that width to its western end at Gay Head. From its eastern entrance to a line joining Cuttyhunk with Gay Head the Sound is about twenty miles long, and contains within its limits sufficient water for the largest vessels. Its shores are for the most part clean,—the shoals lying mainly in the direction of the axis of the Sound, with wide and deep channels among them, affording bearing room for the largest vessels. There are several good harbors on both shores; the principal of which are Wood's Hole and Tarpaulin Cove on the north, and Edgartown Harbor and Vineyard Haven (formerly called Holmes' Hole) on the south shore. These will be fully described in their proper places.

Martha's Vineyard is a large and fertile island of irregular shape, lying nearly **E.** and **W.**, and about eighteen miles long. Its width is greatest midway of its length, where, from West Chop across the island to the beach on the south side, the distance is seven miles and three-quarters; but from this line it diminishes each way,—being four miles wide at its western end and about the same width from Cape Poge to Wasque Bluff at its eastern end. The island is well settled, especially along its northern shore,—the centre being for the most part thickly wooded, and the general appearance as seen from the Sound being that of an undulating hilly country, composed mainly of wooded crests with cleared and cultivated valleys between them.

Martha's Vineyard.

Cape Poge is not in reality a part of the Vineyard, although usually considered as such. It is the northeastern extremity of a very irregularly shaped island called Chappaquiddick Island, which is separated from the Vineyard by Edgartown Harbor and Cotamy Bay. Inasmuch, however, as there is now no opening into the latter from the southward, the island is usually considered as a part of Martha's Vineyard. Cape Poge is a bare, bluff, precipitous head, with a white light-tower rising from a group of white houses at its northern extremity. From the cape to the southward runs a long narrow strip of sand with perpendicular faces to the eastward, which extends for four miles to Wasque Bluff; but for half this distance the higher lands of the island, diversified with woods and clearings, will appear over the beach. Cape Poge Light-house, which marks the southern side of the eastern entrance to Vineyard Sound, is a wooden tower, whitewashed, thirty-six feet high, and connected by a covered way with the keeper's dwelling—also white. It shows a fixed white light, of the fourth order of Fresnel, from a height of fifty-seven feet above the sea, visible thirteen miles. Its geographical position is

Cape Poge and Light-house.

Latitude	41° 25' 14" N.
Longitude	70° 27' 5" W.,

and it bears from

Cross Rip Light-vessel, W. ½ S.	Miles.
Succonesset Light-vessel, S. by W. ½ W.	7 ½
Nobska Point Light-house, SE. ½ E.	10 ½
Nantucket Light-house, W. by N. ½ N.	a little over 18

There is no fog-signal at this light-house.

Chappaquiddick Island, as before mentioned, is very irregular in shape and forms the eastern shores of Edgartown Harbor and Cotamy Bay. Cape Poge is its northeastern point, from which a long and narrow strip of low sand extends to the southwestward and southward, nearly uniting at its southern end with a high, perpendicular, yellow bluff called **North Neck**. The opening between this neck and the southern end of the sand is about one hundred yards wide, and leads into a broad but very shallow bay called **Cape Poge Bay**, and sometimes **Cape Poge Pond**. This bay is separated from the Maskeget Channel on the east by another narrow strip of sand extending from Cape Poge to the southward towards Wasque Bluff.

Chappaquiddick Island.

Edgartown Harbor, the entrance to which lies on the western side of Cape Poge, affords excellent shelter to such vessels as are able to enter the Inner Harbor,—the least water in the channel being fifteen feet, with a rise of two feet, and good anchorage in from three to five fathoms between **Chappaquiddick Point** and the village. But the Outer Harbor is simply a roadstead, entirely open to northerly and northeasterly winds. It is not, therefore, recommended as an anchorage, although the holding-ground is good; and vessels which are obliged to seek it should endeavor to obtain a pilot into the Inner Harbor. Failing in this, they will have an uncomfortable berth in the Roads.

Edgartown Harbor.

The local guide to this harbor is called Edgartown Light-house, and is shown from the top of a two-story white dwelling, standing on the end of a long wharf which is built out from **Starbuck Point**. This point is in the southwestern corner of the bight which forms the roadstead, and is also the northern point of entrance to the Inner Harbor. The light-house shows a fixed white light, of the fourth order of Fresnel, from a height of thirty-seven feet above the sea, visible eleven miles. Its geographical position is

Edgartown Light-house.

Latitude	41° 23' 25" N.
Longitude	70° 30' 12" W.,

and it bears from Succonesset Light-vessel **SW. by S. ½ S.**, distant nine miles. There is no fog-signal.

Nearly six miles **NW. ½ W.** from Cape Poge Light-house is East Chop, the eastern point of entrance to Vineyard Haven or Holmes' Hole. The shore of Martha's Vineyard from Starbuck Point has a direction first about **N.** by **W.** for nearly three-quarters of a mile, being composed entirely of low, level, grassy lands, destitute of trees and showing occasional perpendicular faces; thence it makes a long curve to the westward and northwestward for a little over three miles, being composed of flat sand beach backed by moderately high, gently sloping and cleared

East Chop.

lands, and these again by partially wooded crests. From the northern end of this bight it runs about N. by W. for a mile and three-quarters to East Chop, presenting much the same features as that to the southward, except at East Chop itself, which is a high bluff head with nearly level surface and precipitous sandy faces. Its summit is thickly covered with houses, forming part of the village of **Eastville**, or what is now known as **Oak Bluff Settlement**. A prominent object among these houses is a tall square tower of open work surmounted by a flag-staff and standing just to the southward of the extremity of the point. This is the **Telegraph Station**. On the extreme northern edge of the bluff is situated the light-house, known as **East Chop Light-house**. It is an iron tower twenty-four feet high, painted white, and shows a fixed red light, of the fourth order, from a height of seventy-nine feet above the sea, visible fourteen and a half miles. In front of the tower is the keeper's dwelling, which is white and has a **Mansard roof**. The geographical position of the light-house is

Latitude ----- 41° 28' 11" N.
Longitude ----- 70° 34' 4" W.,

and there is no fog-signal.

On the western side of the Chop makes in a deep bight known as **Vineyard Haven**, formerly **Holmes' Hole**. It is about a mile and a half long in a SW. direction and has good water, (from three to five fathoms,) but is open to northerly and north-easterly winds, and is not recommended to strangers as a harbor of refuge.

A mile and a half NW. by W. from East Chop is West Chop, the western point of entrance to Vineyard Haven. Here is situated the light-house which is the local guide to that harbor. West Chop is a low, sandy and somewhat undulating point, covered with grass, backed by a thick growth of low trees, and has perpendicular faces to the northward. To the eastward (that is, towards the entrance to the harbor) it extends into a long, flat, sandy point called **West Chop and Light-house**. **Low Point**; and midway between this and the north pitch of the Chop is built the light-house called **Holmes' Hole** or **West Chop Light-house**,—a white tower, connected with the keeper's dwelling by a covered way. It stands about one hundred yards back from the beach, is surrounded by bushes, and shows a fixed white light, of the fourth order, from a height of sixty-nine feet above the sea, visible thirteen miles. Its geographical position is

Latitude ----- 41° 28' 49" N.
Longitude ----- 70° 36' 0" W.,

and there is no fog-signal.

From West Chop the northern shore of the Vineyard has a general direction about W. by S. $\frac{1}{4}$ S., nearly three miles, to a bluff point, with somewhat undulating surface and perpendicular sandy faces, cleared and partially cultivated. and backed by a thin and somewhat scattered growth of trees. Thence it curves away to the southwestward and westward, forming an indentation known as **Lumbard's Cove**, the western point of which is called **Paul's Point**, and has a gently sloping surface, with precipitous sandy faces,—which it may be remarked is the predominant feature of the shore-line along the whole northern shore clear to **Menemsha Bight**. **Lumbard's Cove** has good anchorage in from two to five fathoms, sticky bottom.

From Paul's Point the shore runs about W SW. for nearly a mile to **Cedar Tree Neck**; thence SW. for two miles and a half to **Cape Higgon**; and thence SW. Southerly for three miles to the middle of **Menemsha Bight**. All of this part of the island partakes of the same general character,—appearing, when viewed from the Sound, as a very hilly country, much cut up by hillocks, with small valleys between them,—the hills being mostly thinly wooded and the valleys cleared and under cultivation. Houses are seen at intervals along the shore. Conspicuous among the higher elevations on this side of the island are **Indian Hill**, a somewhat steep grassy hill three-quarters of a mile inland from Paul's Point; and **Prospect Hill**, also bare of trees and grassy, which lies nearly two miles to the southward of Cape Higgon. Both will be easily recognized by strangers.

Menemsha Bight is a deep curve in the northern shore of the Vineyard, extending from Prospect Hill to within a mile and a half of Gay Head. Its shores are diversified,—the centre being composed of innumerable sand hillocks separated by narrow channels; the eastern shore of undulating lands of various heights, cultivated and settled; and the western shore of low and thinly wooded lands, faced by sand beach dotted with innumerable hillocks. Within half a mile of Gay Head, however, the land begins to rise, showing perpendicular sandy faces of moderate height and a somewhat undulating surface bare of trees.

Gay Head and Light-house. Gay Head, the western extremity of Martha's Vineyard, is a very remarkable headland, appearing, when seen from the westward, as a high bare bluff, with remarkable perpendicular cliffs which have a furrowed appearance owing to the washings of innumerable rains. The yellow appearance of these cliffs is the more remarkable from the fact that the land on both sides of them looks dark,—almost black,—owing to the grass with which it is thickly covered. On the summit of the head, and but a short distance back from the edge of the cliffs, stands the light-house, which is the guide to the western entrance to Vineyard Sound, and is known as **Gay-Head Light-house**. It is a primary sea-coast light of the first order of Fresnel, and is shown from a red brick tower connected by a covered way with a dwelling of the same color. It flashes every ten seconds, every fourth flash being red; is shown from a height of one hundred and seventy feet above the sea, and is visible twenty miles. Its geographical position is

Latitude ----- 41° 20' 52" N.
Longitude ----- 70° 50' 8" W.



Fig. 12.

Sound and Figure 12.

Fig. 13.

Fig. 14.

Fig. 15.

West Entrance to Foul Bay Sound, Cutbank L. Ho. bearing N. by E. about 14 Miles.

Gay Head Light-house bears from

	Miles.
Nobska Point Light-house, SW. $\frac{3}{4}$ W.	12 $\frac{1}{2}$
Tarpaulin Cove Light-house, SW. $\frac{3}{4}$ S.	nearly 8
Cuttyhunk Light-house, SE. $\frac{1}{2}$ S.	6 $\frac{1}{2}$
Vineyard Sound Light-vessel, SE. by E. $\frac{1}{2}$ E.	7 $\frac{1}{2}$
Block Island North Light-house, E. $\frac{1}{2}$ N.	34
Block Island Southeast Light-house, E. $\frac{3}{4}$ N.	34 $\frac{1}{2}$

NORTH SHORES OF VINEYARD SOUND.

Succoneset Point is low, flat and sandy, and is backed by thick woods. The dangerous **Succoneset Shoal** makes off from it in an easterly direction, and is marked by a light-vessel, called **Succoneset Shoal Light-vessel**, placed in six fathoms two and three-eighths miles **SE. $\frac{1}{4}$ E.** from the point. From this point the shore runs **W.** for a mile and three-quarters to the entrance to **Waquoit Bay**, which is a broad but shallow bay making in a northerly direction for about one mile and five-eighths to **Waquoit Village**. The bay has an average width of half a mile between low sandy shores partly wooded and partly cleared; but its entrance is less than two hundreds yards wide, and unfit for navigation except by vessels of the smallest size. From the entrance to **Waquoit Bay** the shore has a general course **W. $\frac{1}{2}$ N.** for four miles and an eighth to **Falmouth Harbor**, so-called, though it is in reality no harbor except in northerly or westerly winds. The shore presents the appearance of low and level sandy land, cleared and settled, and backed by thick woods. The vicinity of **Falmouth** is easily recognized by the numerous wind-mills placed close to the shore, and which are connected with the extensive salt-works at that point. There are several wharves for the accommodation of the vessels which resort thither. All of this shore is foul and should not be approached nearer than five-eighths of a mile.

From **Falmouth** the shore takes a curve to the westward and southwestward, running first about **W. by S.** for a mile and an eighth, and then **SW. $\frac{1}{2}$ S.** for a mile and a quarter to **Nobska Point**, the southwestern extremity of the peninsula of Cape Cod. It is all low, flat and sandy, with occasional clumps of trees, except at **Nobska Point**, which is a high round head with slightly undulating surface, covered only with grass, and showing steep sandy faces on all sides. It is also the eastern point of entrance to **Wood's Hole**; and upon its summit is built the light-house known as **Nobska Point and Point Light-house**, which is the guide to that harbor as well as useful to vessels passing through the Sound. The light is shown from a red tower, thirty-five feet high, and is a fixed white light, of the fifth order of **Fresnel**, visible thirteen miles. The keeper's dwelling, which is a one and a half story building, painted drab color, stands a short distance to the eastward of the tower. The light is eighty-nine feet above the level of the sea, and its geographical position is

Latitude	41° 30' 55" N.
Longitude	70° 39' 19" W.

A short distance to the southwestward of the light-house will be seen the bell-tower, containing a **fog-bell**, which is struck by machinery. The bell, during thick or foggy weather, is struck twice in quick succession, followed by an interval of thirty seconds, and then gives a single blow, followed by the same interval.

Nobska Point Light-house bears from

	Miles.
Succoneset Shoal Light-vessel, W. $\frac{3}{4}$ N.	nearly 10
Cross Rip Light-vessel, NW. by W. $\frac{1}{2}$ W.	nearly 17
West Chop Light-house, NW. $\frac{1}{2}$ N.	3 $\frac{1}{2}$
Tarpaulin Cove Light-house, E. by N. $\frac{3}{4}$ N.	5 $\frac{1}{2}$
Gay Head Light-house, NE. $\frac{3}{4}$ E.	12 $\frac{3}{4}$

On the western side of **Nobska Point** is **Wood's Hole**, a somewhat crooked passage leading between the southwestern end of Cape Cod and the islands of **Nonamesset** and **Uncatena** into **Buzzard's Bay**. It has water sufficient for large vessels,—there being not less than three and three-quarter fathoms up to the anchorage in **Great Harbor**,—but it is not advisable for strangers to enter it without a pilot on account of the many ledges and shoals which obstruct the passage. There are three harbors in **Wood's Hole**, viz: **Little Harbor**, on the eastern side, the entrance to which is nearly half a mile to the northwestward of **Nobska Point**; **Great Harbor**, (the principal anchorage,) lying just to the westward of **Little Harbor**; and **Hadley Harbor**, on the western shore of the passage, and contained between **Uncatena** and **Nonamesset** islands and the northeastern end of **Naushon**.

Little Harbor is contained between part of the southwestern end of Cape Cod and a long, low, nearly level and grassy point, with sandy precipitous faces to the southward and westward, and partly covered with low scrub. This is called **Parker's Neck**, and makes off in a southerly direction from abreast of the village, separating **Little Harbor** from the entrance to **Great Harbor**, to the westward of it.

Great Harbor, which is the harbor proper and the usual anchorage, is contained between the mainland on the east and an irregularly shaped island, called **Long Neck**, on the north and west. This island is of moderate height, undulating, covered only with grass, and has several houses and a wharf on its eastern side, plainly visible to vessels approaching the harbor from **Vineyard Sound**. A breakwater about forty yards long joins its eastern end to the mainland. Anchorage may be found in **Great Harbor** in from four to ten fathoms, sheltered from all winds.

Hadley Harbor is a cove of irregular shape contained between the southeastern shore of Uncatena, the western end of Nonamasset, and a small portion of the eastern end of Naushton with its outlying islets. It has good anchorage in from two to three fathoms; but the entrance is much obstructed by dangerous ledges, and it is not therefore recommended to strangers.

Nonamasset Island, which lies on the western side of the entrance to Wood's Hole, is about a mile and an eighth long, and presents an undulating surface, diversified with cleared fields, woods and grass lands. At its eastern end, which forms the western point of entrance to Wood's Hole, it descends into a low nearly flat point, faced with rocks, covered only with a scant growth of grass, and called **Mink Point**. Near the centre of the island will be seen hills of moderate height, covered with grass, but its western end is for the most part low and thickly wooded. It is the easternmost of the **Elizabeth Islands**. Between Nonamasset and Naushton islands there is a shallow cove, about three-quarters of a mile wide, called **Lackey's Bay**. It affords shelter in northerly winds, in from six to fourteen feet water, for small vessels; but is otherwise of no importance.

Naushton Island, by far the largest of the Elizabeth Islands, (forming the northern shore of Vineyard Sound,) lies nearly E. N. E. and W. S. W., and is between five and six miles long. Its surface is undulating and diversified with wooded grassy hills and occasional cleared lands. **Job's Neck**, its southeastern extremity, (which is also the western point of entrance to Lackey's Bay,) is low, level and grassy, with a flat grassy head at its eastern end. Thence to the westward the land gradually rises, with its summits and slopes thickly covered with woods for about a mile; when ranges of grassy hills again appear and extend to Tarpaulin Cove.

Tarpaulin Cove, which is an excellent harbor of refuge, lies nearly four miles to the westward of Wood's Hole and about four miles and a half to the eastward of Quick's Hole. It is formed by a semicircular cove on the southern shore of Naushton Island, almost exactly midway between its eastern and western ends, and affords excellent anchorage, in from two to three fathoms, during northerly and northwesterly winds. It is, however, open to the eastward, and vessels should not attempt to anchor here in easterly gales, but should make Wood's Hole if possible, and if not, should pass through Quick's Hole and find shelter in Buzzard's Bay.

The northeastern point of entrance to Tarpaulin Cove is a high grassy head with precipitous sea-face, and has several large detached boulders at its base. The western point of entrance is of moderate height, bare and grassy, and has upon it a white light-tower attached to the keeper's dwelling, which is also white. This is called **Tarpaulin Cove Light-house**, and is a guide through the Sound as well as into the harbor. It is thirty-two feet high, and shows a fixed white light varied by flashes at half-minute intervals from a height of eighty feet above the sea. It is of the fourth order of Fresnel, visible fifteen miles. Its geographical position is

Latitude 41° 28' 6" N.
Longitude 70° 45' 28" W.,

and it bears from

Nobska Point Light-house, W. by S. $\frac{1}{4}$ S.	Miles. 5 $\frac{1}{2}$
West Chop Light-house, W. $\frac{1}{2}$ N.	7 $\frac{1}{2}$
Gay Head Light-house, NE. $\frac{1}{4}$ N.	nearly 8

The western shore of Tarpaulin Cove from the light-house to the **Store Wharf** is rocky, undulating, and nearly bare of trees; but beyond this, up into the head of the cove, the shore is low and sandy, faced by a white sand beach and backed by a very thick growth of low bushy trees. From the head of the cove, along the northern shore to the eastern point of entrance, the land is of moderate height, somewhat steep and undulating, and strewn with boulders. It is quite safe for strangers to enter this harbor by following the directions given for it under its proper head.

From Tarpaulin Cove to its western end Naushton Island presents an undulating surface composed of long ranges of grassy hills interspersed with others thickly wooded. The southern shore is composed of steep, almost perpendicular, sand cliffs.

About five-eighths of a mile to the westward of Tarpaulin Cove Light-house there is a small indentation in the shore-line with sandy beach, back of which is a fresh-water pond. This is known as the **French Watering Place**.

At its western end Naushton Island is separated from Pasque Island by a narrow and dangerous passage leading into Buzzard's Bay and called **Robinson's Hole**. It is about seven hundred yards wide at its southern entrance but rapidly diminishes in width to two hundred yards; is full of dangerous rocks and is not safe for strangers. The entrance to it is two miles and a half to the westward of Tarpaulin Cove.

Pasque Island lies E. by S. and W. by N., is a mile and a half long, with slightly undulating surface, covered only with grass, and sloping somewhat steeply to the southward, with low sand cliffs here and there. There are one or two houses on its eastern and western ends. It is separated on the west from Nashawena Island by a passage three-quarters of a mile wide called **Quick's Hole**,—a commonly used passage from Vineyard Sound into Buzzard's Bay. It has from five to eight fathoms in the channel, and its few obstructions are well buoyed, so that it is safe for strangers to pass through it. The entrance bears N. $\frac{1}{2}$ W. from Gay Head Light-house, distant exactly five miles.

There is a strong current setting through Robinson's Hole and Quick's Hole; and it is especially dangerous for vessels to be caught close inshore in the vicinity of the former should the wind be light and the tide setting through into Buzzard's Bay. In such cases it is imperatively necessary to anchor and wait for a breeze or a turn of the tide, without making attempts to clear off, which would be very apt to end in disaster.

The northeastern extremity of Nashawena Island extends into a long, low, sandy point faced with innumerable boulders; but the land rapidly rises towards the southeastern end, showing bare grassy hills, with slightly undulating surface, and lines of boulders at their base. On the south shore, just to the westward of the entrance to Quick's Hole, begin remarkable high water-worn sandy cliffs, which serve as a landmark for the recognition of the passage. The **Nashawena Island**, summits show undulating surfaces covered with grass only, and near the northeastern end there will be seen a cluster of three houses, which form prominent objects on the otherwise bare surface. Nashawena Island lies nearly **E.** and **W.** and is two miles and a half long. At its western end it is separated by a very narrow and shoal passage, called **Cananisset Gut**, from Cuttyhunk Island, the westernmost of the group.

Cuttyhunk Island lies nearly **NE.** by **E.** and **SW.** by **W.** and is a mile and three-quarters long in its main part; but at its eastern end it sends off a long, low and narrow tongue of land, which extends to within one hundred and fifty yards of the western end of Nashawena, increasing the length of the island on its southern side to two miles. Seen from the Sound it shows as a high island, with undulating hilly surface covered with grass,—steep precipitous **Cuttyhunk Island and Light-house.** yellow sand bluffs extending about half way up its southern face, from the eastern end, to about midway between its eastern and western ends. The western half of the island has a dark appearance and slopes more gradually—descending at the western extremity to a low flat point, upon which is built the light-house, known as Cuttyhunk Light-house. It is a low tower on the keeper's dwelling, which is painted white, and shows a fixed white light, of the fifth order, from a height of forty-two feet above the sea, visible twelve miles. Its geographical position is

Latitude	41° 24' 50" N.
Longitude	70° 56' 59" W.,

and there is no fog-signal.

Cuttyhunk Light-house bears from

	Miles.
Gay Head Light-house, NW. $\frac{1}{2}$ N.	6 $\frac{1}{2}$
Dumpling Rock Light-house, (at the entrance to New Bedford,) S. by W. $\frac{1}{2}$ W.	7 $\frac{1}{2}$
Hen and Chickens Light-vessel, SE. $\frac{1}{2}$ E.	3 $\frac{1}{2}$
Brenton's Reef Light-vessel, E. by S. $\frac{1}{2}$ S.	nearly 19 $\frac{1}{2}$
Point Judith Light-house, E. $\frac{1}{2}$ S.	a little over 24
Block Island North Light-house, E. by N.	30 $\frac{1}{2}$
Block Island Southeast Light-house, E. by N. $\frac{1}{2}$ N.	31

DANGERS

ON THE EAST COAST OF CAPE COD, AND IN APPROACHING, ENTERING AND PASSING THROUGH NANTUCKET AND VINEYARD SOUNDS BY THE NORTH CHANNEL.

I. Crossing the Broken Part of Pollock Rip.—It is usual for vessels coming from the northward to coast Cape Cod, which may be done with perfect safety, even in thick weather, by a judicious use of the lead. In clear weather, vessels usually go close to the eastern shore of the cape, carrying not less than seven fathoms; but in thick weather, or heavy easterly gales, they should under no circumstances go inside of twenty fathoms, and should use the lead frequently. This rule is imperative, and a disregard of it has caused many disasters, especially on that part of the cape between Race Point and the Highlands. As a rule, coasters neglect the use of the lead; and nearly every disaster which has occurred upon the sandy portions of our coast may be traced to a disregard of that very important duty of a mariner when on soundings.

The greater part of the eastern shore of the cape is comparatively clean and may be closely approached in fine weather; but that portion which extends from Race Point to the Highlands should not be approached nearer than a mile and a half, even in fine weather, except by vessels whose masters are perfectly conversant with this part of the coast. The shoals off the cape are all sand bars, and the most northerly of these as well as the most dangerous is known as **The Sand Bar**, the shoal of which, having ten feet, lies two and five-eighths miles **NE.** by **E.** $\frac{1}{2}$ **E.** **The Sand Bar.** from Race Point Light-house and seven miles **NW.** $\frac{1}{2}$ **W.** from Highland Light-house. Shoal water extends from these bearings a quarter of a mile in a **NW.** by **W.** direction. The Sand Bar is a detached shoal,—there being five fathoms inshore of it; but vessels should under no circumstances attempt to pass between it and the shore, as the beach is flat—eleven feet being found half a mile from it.

But perhaps the most dangerous of all the obstructions on this part of the cape is what is locally known as **Outer Bar**, or **Peaked Hill Bar**, and extends along the coast at a distance from the beach of about five-eighths of a mile (or between thirteen and fourteen hundred yards) from **The Sand Bar** to about three miles to the southward of Highland Light-house. There are shoal spots upon it of seventeen and eighteen feet, and many soundings of between three and four fathoms, where the sea breaks with great violence in heavy easterly weather. As these easterly gales are frequently accompanied in winter with snow and consequent thick weather, when the lights cannot be seen, mariners are again cautioned not to go inside of twenty fathoms on this part of the coast.

To the southward of the Highland Light-house the shore is cleaner, and in ordinary weather it is safe to keep in ten fathoms, but not in easterly or thick weather, when the twenty-fathom rule should be rigidly adhered to.

When in the vicinity of Chatham there will be seen, well to the westward of the course, a large red buoy. This is the "Whistling Buoy," sounded by the motion of the sea, and placed in six fathoms water off the entrance to Pleasant Bay. A line of breakers will be seen inshore of **Chatham Bar**. the buoy in almost all weathers. These are on Chatham Bar, and the buoy is placed off its eastern extremity. The name is a misnomer at present, as the real Chatham Bar is off the southern entrance to the harbor in Nantucket Sound, and this opening does not connect with Chatham at all, except by a very narrow slue, through which small boats may pass at high water. From this buoy the southernmost Chatham Light-house bears **W. $\frac{3}{4}$ S.**, distant one mile and three-quarters, and Pollock Rip Light-vessel **S. by W. $\frac{1}{2}$ W.**, distant eight miles and three-quarters.

When to the southward of Chatham Bar, Nauset Beach should not be approached nearer than a mile to avoid some *outlying shoal spots near its southern end*, one of which has thirteen feet upon it at mean low water; but the courses pass well to the eastward of all these dangers.

Should it be desired to take the westernmost channel into the Sound, the course which will be steered will lead across the Broken Part of Pollock Rip, and when about four miles to the southward of Chatham Light-houses, Pollock Rip Light-vessel will be plainly visible a little to the eastward of the course; or, if at night, the course steered will bring it directly ahead. Strangers rarely attempt, however, to cross the Broken Part of the Rip,—preferring, if intending to enter through Butler's Hole, to keep to the southward until the light-vessels on Pollock Rip and Shovelful Shoal are in range on a bearing of **W. by N.**; but as the different channels will be described in detail, those dangers will first be described which are met with by vessels which intend to cross the Broken Part of Pollock Rip. And here it may be remarked in general, that great caution must be exercised in traversing these passages on account of the conflicting nature and strength of the currents and the shifting character of the shoals. It is not unusual for shoal lumps to crop up in the middle of the channels where was formerly the best water, and a careful use of the lead is therefore strongly recommended. In thick weather it is not considered advisable for any vessel to attempt these passages unless with experienced pilots who are acquainted with the set and velocity of the currents, the times of high and low water, and the relation of those times to the direction of the currents. At night, in ordinary weather, there will be little difficulty in crossing the Rip if the bearing of Pollock Rip Light-vessel be kept; but without some such check as this it is not safe for strangers.

The shoals to the eastward of Monomoy Point Light-house are the most dangerous in this channel. Of these the most important is Pollock Rip, a series of sand shoals and sand ridges with from ten to eighteen feet upon them and deep water between them, extending a distance of **Pollock Rip**. five and a third miles about **SE. by E. $\frac{1}{2}$ E.** from Monomoy Point Light-house. The main body of the shoal is joined at its northern end to the eastern end of Bearse's Shoal, which extends to within three-eighths of a mile of Monomoy Point Light-house. The ridges which compose Pollock Rip are formed of hard grey sand and gravel, are very narrow, and extend, some in a **N.** and **S.** and some in an **E.** and **W.** direction,—their positions being usually indicated by the strong tide-rips over them.

Three miles to the eastward of Monomoy Point Light-house the Rip is broken by a channel with an average width of about five-eighths of a mile and a depth of from three and a quarter to five fathoms. This is considered a safe channel in clear weather and is much used by coasters. It is, however, liable to the formation of lumps, several of which have been discovered by late surveys; and the careful use of the lead in crossing it is enjoined. That portion of the Rip which lies on the eastern

Broken Part of Pollock Rip. side of this channel is called the Broken Part of Pollock Rip, and is composed of a number of narrow ridges of hard sand extending in a northerly and northwesterly direction with from twelve to sixteen feet upon them. The northwestern end of this part of the Rip bears **E. by S. $\frac{3}{8}$ S.** from Monomoy Point Light-house, distant four miles and an eighth, and from Pollock Rip Light-vessel **NE. $\frac{1}{2}$ N.**, distant one mile and an eighth. Its southern end bears from Monomoy Point Light-house **SE. by E. $\frac{3}{8}$ E.**, distant five miles and a quarter, and from the light-vessel **E. by S.**, distant one mile and seven-eighths. This southern end is marked by an iron can-buoy of the first class, painted red, and placed in five and a half fathoms, as a guide to the main entrance to Butler's Hole; but vessels crossing the slue pay no attention to it.

But, besides the Broken Part of the Rip, there is a *dangerous detached shoal, with from fifteen to eighteen feet water upon it*, lying three-quarters of a mile to the northwestward of the Broken Part and nearly in the middle of the slue channel. Although part of Pollock Rip, strictly speaking, it is so widely detached from both parts as to merit the title of a distinct shoal,—there being equally good water on both sides of it. Its direction is about **E. $\frac{3}{4}$ N.** and **W. $\frac{3}{4}$ S.**, its length nearly half a mile, with eighteen feet water on its western end and fifteen at its eastern extremity, where there is placed an iron nun-buoy of the first class, painted red, and marked No. 2. It is usual for vessels to pass to the eastward of this buoy,—those only who understand the set of the currents using the inshore channel. This buoy is the first one seen on approaching the Sound from the northward, and it bears from

THE FOLLOWING INFORMATION WAS RECEIVED AFTER THIS VOLUME HAD GONE TO PRESS.
**On and after November 1, 1880, the fog-whistle on Pollock Rip Light-vessel will give, during
or foggy weather, blasts of five seconds' duration, followed by intervals of fifty-five seconds.**

Monomoy Point Light-house **E. $\frac{3}{4}$ S.**, distant three miles and three-quarters, and from Pollock Rip Light-vessel **N. by E. $\frac{3}{4}$ E.**, distant a little over a mile and three-quarters. When up with it, another nun-buoy of the first class, painted red, will be seen bearing **SW. by W. $\frac{1}{4}$ W.**, and a little over a mile off. This marks the eastern extremity of the *Main Part of Pollock Rip*, is marked No. 4, placed in nineteen feet at low water, and must be left to the westward. It bears from

	Miles.
Monomoy Point Light-house, E. by S. $\frac{1}{8}$ S.	3 $\frac{1}{8}$
Shovelful Light-vessel, E. $\frac{5}{8}$ N.	about 3 $\frac{1}{4}$
Handkerchief Light-vessel, E. by N. $\frac{3}{4}$ N.	7 $\frac{1}{8}$
Pollock Rip Light-vessel, N. $\frac{3}{4}$ W.	1 $\frac{1}{8}$

When up with it vessels of not over twelve feet draught are accustomed to run for Handkerchief Light-vessel, but this course is not recommended to strangers or to vessels of large draught, as it passes close to the northern end of Stone-Horse Shoal and there are several shoal lumps in its vicinity.

Bearse's Shoal, which is next to the westward of Pollock Rip, and is, in fact, a continuation of it, is a mile and three-quarters long in a nearly **E. and W.** direction, and extends to within six hundred yards of the Monomoy beach. The soundings on it vary from five to eighteen feet,—the shallowest water lying along its southern side, while ten and eleven feet are found on its eastern end, nine feet at its western extremity, and spots of from ten to thirteen feet at intervals over the body of the shoal. At its western end there extends, about **NE. by N. $\frac{3}{4}$ N.**, an arm or spit of the shoal with from six to sixteen feet upon it, and about five-eighths of a mile long; and at the junction of this with the western end of the shoal there is placed a nun-buoy of the third class, painted black, and marked No. 1. It is intended as a guide to the Beach Channel,—a narrow passage running between Monomoy beach and the northwest spit of Bearse's Shoal, with sixteen feet at mean low water. This channel is often used by those who are familiar with its dangers, but it should under no circumstances be attempted by strangers.

*Bearse's
Shoal.*

Bearse's Shoal is not in the way of vessels entering by the slue in Pollock Rip unless they are standing to the westward on a wind.

About a mile and an eighth to the northwestward of the red nun-buoy on the Broken Part of Pollock Rip, between the bearings of **N. by W. $\frac{1}{4}$ W.** and **NE. by N. $\frac{3}{4}$ N.**, lie two shoals with seventeen feet at mean low water. They consist of a narrow ridge of sand extending about three-eighths of a mile in a **NE. $\frac{1}{4}$ E.** direction, and a small lump lying about two hundred and fifty yards to the eastward of the southern end of the ridge. The northern end of the sand ridge bears **E. by N. $\frac{1}{4}$ N.** from Monomoy Point Light-house, three miles and a half distant, and the detached lump bears **E. by N.** from the same light-house, three miles and a quarter distant. There is usually a strong rip upon them, as there is also over the shoal spots on Bearse's Shoal and Pollock Rip.

The rule for vessels crossing the slue is to steer for Pollock Rip Light-vessel until up with it, when the course is shaped for Shovelful Light-vessel. Pollock Rip Light-ship is a two-masted vessel, painted red, with the words "*Pollock Rip*" in large white letters on each side of the hull, and two red hoop-iron day-marks at the mastheads. It is anchored in five fathoms, in mid-channel, to the southward of the slue across Pollock Rip, and shows two fixed red lights from a height of forty-five feet above the sea, visible twelve miles. Its geographical position is (approximately)

*Pollock Rip
Light-vessel.*

Latitude 41° 31' 57'' N.
Longitude 69° 55' 0'' W.,

and it bears from the red buoy on the detached shoal to the northward of the Broken Part of Pollock Rip **S. by W. $\frac{3}{4}$ W.**, a little over a mile and three-quarters; from the buoy on the southern end of the Broken Part **W. by N. $\frac{1}{4}$ N.**, one mile and seven-eighths; and from Shovelful Light-vessel **E. by S.**, three miles and three-eighths distant.

There is a twelve-inch steam fog-whistle on Pollock Rip Light-vessel, which, in thick or foggy weather, gives, during each minute, a blast of five seconds' duration, followed by an interval of twenty-two seconds, and then a blast of three seconds, followed by an interval of thirty seconds. There is also a bell rung by hand.

When up with Pollock Rip Light-vessel you should not stand to the southward under any circumstances more than half a mile, or farther than to bring Shovelful Light-vessel to bear **W. by N. $\frac{1}{8}$ N.**, in order to avoid the dangerous sand ridges which extend in a **NW.** direction off the northern side of Stone-Horse and Great and Little Round Shoals, which lie between this channel and the Main or Southern Entrance to the Sound.

Great Round Shoal is the easternmost of these three, and, properly speaking, does not obstruct the North Channel; but the outlying sand ridges off its northern side are dangerous to vessels attempting to beat through that passage, and it is therefore proper to give a detailed description of it and of its character. The shoal proper lies about **ESE. and WNW.**, is about two miles long, and has soundings varying from four to twelve feet upon it. But innumerable narrow ridges of hard sand extend in parallel lines (having about a **NW.** direction) so

*Great Round
Shoal.*

Dangers--North Channel. far to the northward as to come within three-quarters of a mile of Pollock Rip Light-vessel,—thus making the entire length of the shoal in a northerly direction about three miles and three-quarters. Also off the southern side extend other sand ridges, some in an E. and W. and others in a NE. and SW. direction, with from ten to sixteen feet water upon them. Over and among these ridges the tide-rips are numerous and strong, and the bottom is so broken that, although narrow passages exist across several parts of the shoal with from fourteen to eighteen feet water in them, yet it is not advisable for any stranger, however light his draught, to attempt to pass through them.

The shoalest part of Great Round Shoal, which is close to its southern edge and has four feet at mean low water, bears from

	Miles.
Pollock Rip Light-vessel, S. $\frac{1}{2}$ W. -----	4 $\frac{3}{4}$
Monomoy Point Light-house, S SE. -----	7 $\frac{1}{2}$
Handkerchief Light-vessel, E. by S. $\frac{1}{2}$ S. -----	7 $\frac{1}{2}$
Nantucket Light-house, E. by N. $\frac{3}{4}$ N. -----	7 $\frac{1}{2}$

Three-quarters of a mile S. by E. Easterly from this shoal spot is placed a red spar-buoy, marked No. 2, in twenty feet water, but it is not seen by vessels passing through the North Channel. There is no buoy on the northern end of the shoal, but vessels should not stand farther to the southward than to bring Shovelful Light-vessel to bear W. by N. $\frac{7}{8}$ N., or half a mile to the southward of Pollock Rip Light-vessel.

Next to the westward of the northern part of Great Round Shoal lies Little Round Shoal, which has four and a half feet at mean low water, and is surrounded by shoals with from eight to sixteen feet, connecting it on the west with Stone-Horse Shoal, which obstructs the North Channel. With the shoal water surrounding it, it extends E. by S. and W. by N. for a mile and three-eighths,—there being no practicable passage between it and Great Round Shoal. It does not obstruct the North Channel, and is noticeable in this connection principally as one of the great shoals separating the North and South Channels; but, as is the case with Great Round Shoal, long sand ridges lie off its northern side, extending in a NE. and SW. direction, and dangerous to vessels standing to the southward on a wind. To avoid these ridges, when in their vicinity, vessels should not go the southward of Shovelful Light-vessel bearing W. by N. $\frac{7}{8}$ N. These spots have from twelve to eighteen feet water upon them and are not buoyed.

Little Round Shoal, as before mentioned, is joined at its western end to Stone-Horse Shoal, a mass of shoal ground composed of numerous sand ridges and lumps with from nine to seventeen feet water upon them, and extending in a NW. by N. and SE. by S. direction for nearly two miles. Like the other shoals in this vicinity, Stone-Horse has several outlying ridges on its northern and eastern sides with from eleven to fifteen feet water; and there is one lump with seventeen feet about five-eighths of a mile to the northward of its northern edge and three-quarters of a mile SE. by S. from Shovelful Light-vessel. The rip over the ridges on the strength of the tide is very perceptible,—marking the outline of the shoal with considerable accuracy. On the northwestern end of Stone-Horse Shoal, in six and a half fathoms, is placed a nun-buoy of the second class, painted black and marked No. 5; and from it Shovelful Light-vessel bears N. by E. $\frac{1}{4}$ E., one mile and three-eighths, and Handkerchief Light-vessel W. by S. $\frac{1}{4}$ S., three miles and three-eighths distant.

Vessels standing to the southward on a wind should not, when in the vicinity of Stone-Horse Shoal, go farther than to bring Pollock Rip Light-vessel to bear E. $\frac{3}{4}$ S.

From Pollock Rip Light-vessel the course, as before mentioned, leads towards Shovelful Light-vessel, and when within a mile and a quarter of it a can-buoy of the second class, painted red and black in horizontal stripes, will be seen to the northward of the course and nearly a mile off. This is on a small detached lump, which has eighteen feet at mean low water and lies half a mile E NE. from Shovelful Light-vessel. The buoy is placed on its northern side and the sailing-line passes well to the southward of it.

Shovelful Shoal is the next danger met with. It has from one to ten feet at low water, and extends along the southeastern face of Monomoy Point at an average distance of half a mile from shore. Its general course is NE. and SW. for a mile and a half; and throughout this extent the soundings vary from one to ten feet,—the latter sounding being found near its northeastern end and in various other places near its eastern and southern edges; and also near the middle of the shoal. Near the northeastern end is placed a red spar-buoy (No. 2) to mark the western limits of the Beach Channel. Between this buoy and the light-vessel the shoal may be crossed in six feet

at low water, but to the westward of the light it is in some places almost dry. About a quarter of a mile to the southward of the southwestern edge of the shoal is placed a nun-buoy of the second class, painted red and marked No. 6. It is plainly visible when up with the light-vessel, bearing W. $\frac{5}{8}$ N., five-eighths of a mile from it. The courses pass well to the southward of this buoy, although vessels bound to or from Chatham Roads or Bass River may pass to the northward of it. This buoy formerly marked the northeastern edge of a "sixteen-feet shoal" to the

southward of the southwestern end of the Shovelful, but which has now entirely disappeared,—there being in no place less than three fathoms within a circle of a quarter of a mile from the buoy. Its removal will be recommended.

Shovelful Shoal Light-vessel is a two-masted vessel, painted green, with a red hoop-iron day-mark at the mainmast-head, and the name "*Shovelful*" in large white letters on each side of the hull. It is moored in mid-channel about three-eighths of a mile to the south-eastward of the shoal, and marks the turning point of the passage through Butler's Hole. It shows a fixed red light from a height of forty feet above the sea, visible twelve miles. There is a fog-bell and horn on this vessel; and its approximate geographical position is

Shovelful Shoal Light-vessel.

Latitude ----- 41° 31' 57'' N.
Longitude ----- 69° 59' 40'' W.

Shovelful Light-vessel bears from

	Miles.
Pollock Rip Light-vessel, W. by N. -----	3½
Red nun-buoy on the eastern end of Pollock Rip, W. ⅝ S. a little over	3¼
Monomoy Point Light-house, S. by W. ⅓ W. a little over	1½
Handkerchief Light-vessel, NE. by E. ½ E. -----	4

When past Shovelful Light-vessel the course turns to the southwestward, leading directly for another light-vessel, which will be seen ahead and about four miles off. This is off the southern end of the great shoal known as The Handkerchief, and is called Handkerchief Light-vessel. It is schooner-rigged, with straw-colored hull, and the word "*Handkerchief*" in large black letters on each side; and has two hoop-iron day-marks, (one at each mast-head,) painted black. It is anchored in eight fathoms in mid-channel, three-eighths of a mile S. by E. ⅓ E. from the southern end of the shoal, and shows a fixed white light from a height of forty feet above the sea, visible twelve miles. Its geographical position is (approximately)

Handkerchief Light-vessel.

Latitude ----- 41° 29' 31'' N.
Longitude ----- 70° 3' 45'' W.,

and it bears from

	Miles.
Shovelful Light-vessel, SW. by W. ½ W. -----	4
Nantucket Light-house, N. ¼ E. a little over	6
Cross Rip Light-vessel, E. ¼ N.	10½
Bishop and Clerk's Light-house, SE. ⅓ E. -----	9½

This light-vessel has a fog-bell and horn,—the former of which is sounded in thick weather at intervals not exceeding five minutes.

Handkerchief Shoal, or *The Handkerchief*, off the southern end of which this light-vessel is placed, is one of the most extensive of the shoals which obstruct the approach through the North Channel. It is very irregular in shape, lies nearly NE. by N. and SW. by S., with a length of about three miles and three-quarters and soundings over it varying from four to seventeen feet. What was formerly called *The False Handkerchief*, and which extended in a southeasterly direction from the northern end of the shoal, has been shown by late surveys to be a part of the main shoal, and what was formerly a pocket between the two is now a hole a mile and a half long with from three to six fathoms in it. The southern end of *The Handkerchief* bears from the light-vessel N. by W. ⅓ W., three-eighths of a mile, and from Shovelful Light-vessel SW. by W. ⅓ W., four miles distant. It is marked by a red nun-buoy of the third class (No. 10), placed in four and a half fathoms about one hundred yards to the southward. From this buoy the eastern edge of the shoal has a general course NE. ⅓ N. for about a mile, at which distance it is crossed by a slue channel, (in no place less than two hundred and fifty yards wide,) which runs in a northwesterly direction, with not less than three and a half fathoms, and separates what is now called the Broken Part of *The Handkerchief* from the main body of the shoal.

Handkerchief Shoal.

The *Broken Part of The Handkerchief* is of a somewhat triangular shape, being five-eighths of a mile wide at its northern end and converging to a point at its southern end. It is nearly a mile and a quarter long in a NNE. and SSW. direction, and has from seven to seventeen feet upon it,—the shoalest part lying nearest its eastern edge.

The southern end of the main shoal bears from Shovelful Light-vessel W. by S. ¼ S., nearly three miles distant; and from this point it has a general course about NE. by E. ⅓ E. for a mile and three-quarters to its southeastern end, which bears from Shovelful Light-vessel W. by N., a mile and a quarter; from Monomoy Point Light-house SW. ½ W., two miles; and from Handkerchief Light-vessel NE., three miles and an eighth distant. Here is placed a red spar-buoy (No. 8) in eighteen feet water, which serves also as a guide to the channel leading into Chatham Roads. From this buoy the

Dangers--North Channel. general course of the eastern edge of the shoal is **N. by E. $\frac{1}{4}$ E.** for about a mile to its northeastern extremity, where is placed a black nun-buoy of the third class (No. 1) in eighteen feet water. It bears from Monomoy Point Light-house **W. by S. $\frac{1}{2}$ S.**, a mile and a half, and from Shovelful Light-vessel **NW. Westerly**, about the same distance, and marks the western limits of the channel leading into Chatham Roads. From this buoy the northern edge of the shoal extends in a **NW. $\frac{1}{2}$ W.** direction for nearly two miles to its extreme northern point, where is placed a black spar-buoy (No. 3) in twenty feet water. It bears from Monomoy Point Light-house **W. by N. $\frac{1}{4}$ N.**, a little over three miles distant; and from it the general course of the western side of the shoal is about **S. by W. $\frac{1}{4}$ W.** for two miles and a half, where it meets with the western end of the slue channel separating it from the Broken Part, and which is here about three hundred yards wide.

Of the several buoys above mentioned those on the southeastern and southern ends only will be seen by vessels using this passage. That on the southeastern end may be seen on a clear day when you come abreast of it on the course for Handkerchief Light-vessel, when it will bear **NW. by N. $\frac{1}{2}$ N.**, three-quarters of a mile distant. That on the southern end will first be seen when you are about three-quarters of a mile from the light-vessel, from which position it will bear **W. $\frac{1}{2}$ S.**, three-quarters of a mile distant.

From The Handkerchief vessels may shape their course either to the westward towards Cross Rip Light-vessel, or to the northwestward if bound through the North Channel. In the latter case there is a clear channel for about eight miles; and when about six and a half miles from Handkerchief Light-vessel there will be seen, bearing about **NW. by W.** and three miles distant, a tall granite tower rising from a mass of rocks. This is Bishop and Clerk's Light-house, a grey tower forty-seven feet high, with bell-tower attached to its western side, giving it a peculiar appearance which renders it unmistakable. It shows a white light, flashing once every thirty seconds, from a height of fifty-nine feet above the sea, visible thirteen miles. Its geographical position is

Latitude ----- 41° 34' 25'' N.
Longitude ----- 70° 15' 1'' W.,

and it bears from

	Miles.
Point Gammon Tower, S. $\frac{3}{4}$ E. -----	2 $\frac{1}{4}$
Monomoy Point Light-house, W. by N. $\frac{1}{2}$ N. -----	11 $\frac{1}{2}$
Handkerchief Light-vessel, NW. $\frac{1}{2}$ W. -----	10 $\frac{1}{4}$
Nantucket Light-house, NW. by N. $\frac{1}{2}$ N. -----	14 $\frac{1}{4}$
Cross Rip Light-vessel, NE. by N. $\frac{3}{4}$ N. -----	7 $\frac{3}{4}$

In the bell-tower on the western side of the light-house there is a fog-bell, struck by machinery once every fifteen seconds during foggy weather.

Bishop and Clerk's Shoal, which surrounds the rocks upon which the light-house is built, is a detached shoal of considerable extent, with from four to eleven feet upon it at mean low water. From the light-house it extends in a **NW.** direction for one mile, and in a **S. $\frac{1}{2}$ E.** direction seven-eighths of a mile. A group of dry rocks, upon the northernmost of which the light-house is built, lies at the eastern angle of the shoal, and a red spar-buoy, marked No. 12, is placed in three and a half fathoms off its southern end. The northwestern end of the shoal is not buoyed, but has from sixteen to eighteen feet upon it at low water; and vessels passing on the northern side of it may avoid it by giving the light-house a berth of not less than half a mile to the southward until it bears **SE. by S. $\frac{1}{2}$ S.**; after which they should not go to the southward of that bearing until past the western end of the shoal.

The channel is quite narrow in this vicinity,—the available width abreast of the light-house being not more than three-eighths of a mile between the lines of three fathoms. This is owing to the presence of several detached shoals with from twelve to seventeen feet upon them, which extend in a line about **S. $\frac{1}{2}$ E.** from Senator Shoal, on the northern side of the channel. As this passage is, however, rarely used except by vessels drawing twelve feet or less, these shoal spots are not considered dangerous and are not buoyed.

Senator Shoal lies on the northern side of this channel, forming one of the series of shoals extending from Point Gammon to the southward. It has seven feet at mean low water, and the shoal of the reef lies a mile **SE. by S.** from Point Gammon Tower and one mile and a half **N. $\frac{3}{4}$ E.** from Bishop and Clerk's Light-house. This shoal spot is marked by a red spar-buoy (No. 8) placed in sixteen feet water on its southeastern end. The sailing-line passes well to the southward of it. The bottom is rocky on this shoal, as well as on Bishop and Clerk's; but the buoy is placed on sandy bottom.

With Bishop and Clerk's Light-house bearing about **S. by W.**, a spar-buoy painted red and black in horizontal stripes will be seen a little to the northward of the course and about three-quarters of a

mile off. This is on Hallet's Rock, a small detached ledge, with eight feet at mean low water, lying nearly in the middle of the channel, and bearing from Point Gammon Tower **S.**, a mile and a quarter, and from Bishop and Clerk's Light-house **N.** by **W.** $\frac{1}{2}$ **W.**, a mile and an eighth distant. The buoy is placed in twenty feet on its western side, and the sailing-line passes about an eighth of a mile to the southward of it. To avoid this rock at night, vessels beating through the North Channel should not, when in its vicinity, stand farther to the north-eastward than to bring Bishop and Clerk's Light-house to bear **S SE.** Easterly until Hyannis Light-house bears **N.** $\frac{3}{4}$ **W.**, when they will be to the westward of the rock. *Hallet's Rock.*

About three-quarters of a mile to the northward of the buoy on Hallet's Rock will be seen a red spar-buoy (No. 10) in range with Point Gammon. This is on Gazelle Rock, which is also part of the line of shoals making to the southward from that point, and has five feet at mean low water. From the buoy on Hallet's Rock it bears **N.** $\frac{3}{4}$ **E.**; from Bishop and Clerk's Light-house, **N.** $\frac{1}{2}$ **W.**; from the red buoy on Senator Shoal, **NW.**; and from Point Gammon Tower, **S.** by **E.** $\frac{3}{4}$ **E.**, and is distant from the tower half a mile. The buoy is placed in eighteen feet, sandy bottom, about thirty yards to the southward of the rock, and it is not really in the way of vessels passing through this channel unless they are standing to the northward on a wind. The usual sailing-line passes three-quarters of a mile to the southwestward of it. *Gazelle Rock.*

When about half a mile to the westward of Hallet's Rock, or when Hyannis Light-house bears **N.** $\frac{1}{4}$ **W.**, the course changes to the southwestward and leads about midway between a large red bell-buoy on the northern side, and a spar-buoy, painted red and black in horizontal stripes, on the southern side of the channel. The latter is placed on the northern side of a large shoal known as Hyannis Middle Ground, which extends in a **NW.** $\frac{1}{2}$ **W.** and **SE.** $\frac{1}{2}$ **E.** direction for about a mile and an eighth and has from twelve to seventeen feet water upon it. The shoal of the Middle Ground bears from Bishop and Clerk's Light-house **W.** by **N.**, one mile and a half, and from Hyannis Light-house **S.** $\frac{3}{4}$ **W.**, three miles and five-eighths distant. The buoy is placed to the northwestward of the shoalest part, and bears from Hyannis Light-house **S.** by **W.** $\frac{1}{4}$ **W.**, three miles and three-eighths, and from the large red bell-buoy (No. 14) **SE.** by **S.** $\frac{1}{4}$ **S.**, nearly one mile distant. *Hyannis Middle Ground.*

The bell-buoy on the northern side of the channel is on West-Southwest Ledge, the southernmost of the shoals making to the southward from Hyannis Point; and in winter time it is replaced by a red spar-buoy. This ledge, which is sometimes also called *Gangway Rock*, has about eight feet at mean low water, and bears from Hyannis Light-house **SW.** by **S.**, nearly three miles; from Point Gammon Tower **W.** by **S.** $\frac{3}{4}$ **S.**, two miles and three-eighths; and from Bishop and Clerk's Light-house **NW.** by **W.** $\frac{1}{4}$ **W.**, three miles distant. The bell-buoy is placed to the southeastward of the rock, in seventeen feet water, and bears from Hyannis Light-house **SE.** by **S.** $\frac{3}{4}$ **S.**, two miles and three-quarters, and from Bishop and Clerk's Light-house **NW.** by **W.**, two miles and five-eighths distant. The sailing-lines pass from one-third to half a mile to the southward of it. *West-Southwest Ledge.*

Next to the westward of the bell-buoy on West-Southwest Ledge will be seen a spar-buoy, painted red and black in horizontal stripes. This is on Hodges Rock, with five and a half feet at mean low water, which lies a quarter of a mile to the westward of West-Southwest Ledge and marks also the eastern side of the entrance to Centreville. The buoy is placed on the western side of the rock, in two fathoms water, and bears from Hyannis Light-house **SW.** $\frac{3}{4}$ **S.**, three miles; from Bishop and Clerk's Light-house **NW.** by **W.** $\frac{1}{2}$ **W.**, three and one-eighth miles; and from the bell-buoy on West-Southwest Ledge **W.** by **N.** $\frac{1}{4}$ **N.**, five-eighths of a mile distant. The sailing-line passes three-quarters of a mile to the southward of it; so that it is not in the way unless a vessel is standing to the northward on a wind. *Hodges Rock.*

Nearly seven-eighths of a mile **NW.** by **W.** $\frac{1}{4}$ **W.** from Hodges Rock lies another detached rock, with five feet at mean low water, called Gallatin Rock. A spar-buoy, painted black and marked No. 11, is placed in thirteen feet on the western side of the rock, and bears from Bishop and Clerk's Light-house **NW.** by **W.** $\frac{1}{4}$ **W.**, distant four miles. Vessels in standing to the northward on a wind must beware of this, as well as Collier's Ledge, which lies three-quarters of a mile **W.** by **N.** $\frac{1}{2}$ **N.** from it. This latter is also a detached rock, bare at half-tide, and marked by a granite beacon surmounted by a black spindle with ball and vane on top. It bears from Bishop and Clerk's Light-house **NW.** by **W.** $\frac{1}{2}$ **W.**, four miles and three-quarters, and from Succonesset Light-vessel **NE.** by **E.**, five miles and a quarter distant. From this beacon the bell-buoy on West-Southwest Ledge bears **SE.** by **E.** $\frac{1}{2}$ **E.**, distant two miles. With a fair wind, however, vessels pass so far to the southward of the beacon as not even to see it. *Gallatin Rock and Collier's Ledge.*

When past Hodges Rock there are no dangers for two miles, when, if beating to the westward, it will be necessary to look out, on the southern side of the channel, for the northeastern arm of the great Horse-Shoe Shoal, the most extensive of all the shoals in Nantucket Sound. It receives its name from its shape, which is somewhat that of a horse-shoe, though the southern arm is much longer than the northern. It is composed entirely of hard sand and is dry in several places at mean low water. The eastern extremity of the northern arm may *Horse-Shoe Shoal.*

be said to begin with what is known as the *Broken Ground of the Horse-Shoe*, which has from fourteen to seventeen feet upon it, and is marked by a black spar-buoy (No. 7) placed in three fathoms on its eastern side. This buoy bears from

	Miles.
Bishop and Clerk's Light-house, SW. by W. $\frac{1}{3}$ W. -----	3 $\frac{1}{8}$
Handkerchief Light-vessel, NW. by W. $\frac{3}{4}$ W. -----	11 $\frac{1}{8}$
Cross Rip Light-vessel, N. $\frac{1}{3}$ E. -----	5 $\frac{1}{4}$
Hyannis Light-house, S. by W. $\frac{5}{8}$ W. -----	5 $\frac{1}{4}$

From this buoy the northern arm of the shoal extends to the westward, first about **W NW.** for a mile and seven-eighths, and then **W. $\frac{1}{2}$ S.** for about two miles, to what may be called the "toe" of the Shoe at the northwestern end of the shoal, and the junction of the northern and southern arms: Throughout the above extent the depth is from seven to fourteen feet, hard sandy bottom; but at the northwestern end or "toe" it is dry, and here is placed a large black spar-buoy, marked No. 9, and anchored in four fathoms close to the dry part. In passing through the North Channel, therefore, vessels should not go to the southward of Bishop and Clerk's Light-house bearing **E. $\frac{3}{4}$ N.**, or Succoneset Shoal Light-vessel bearing **W. Northerly.**

The black buoy on the northwestern end of the Horse-Shoe bears from

	Miles.
Bishop and Clerk's Light-house, W. $\frac{3}{4}$ S. Southerly -----	6 $\frac{3}{8}$
Hyannis Light-house, SW. $\frac{1}{4}$ W. -----	7 $\frac{3}{8}$
Succoneset Shoal Light-vessel, E. by S. ----- a little over	2
Cape Poge Light-vessel, NE. by N. ----- a little over	7 $\frac{1}{4}$
Cross Rip Light-vessel, NW. by N. $\frac{1}{3}$ N. -----	6 $\frac{1}{4}$

The southern arm of the Horse-Shoe extends from the "toe" first **S SW. Westerly** for nearly a mile and a half, then **SE. by S.** for a little over two miles and a quarter, where is placed a red nun-buoy* (No. 14), marking the northern side of the South or Main Channel. From this buoy its course is first **SE. by E. Nearly** for two miles and a half; then **SE. by E. $\frac{1}{2}$ E.** for two miles, to where the main body of the shoal terminates, with Cross Rip Light-vessel bearing **W. $\frac{3}{4}$ S.**, distant one mile. But, about a mile and three-eighths to the eastward of this point, there is a patch of broken ground extending nearly **N NE.** and **S SW.** for a mile and an eighth, with from thirteen to sixteen feet upon it; and off its southern end is placed a red nun-buoy,* marked No. 12, which is also a guide to the Main Channel. This buoy bears from Cross Rip Light-vessel **E. $\frac{1}{3}$ S.**, distant two and three-eighths miles.

The depth along the southern arm of the Horse-Shoe varies from one foot to sixteen feet at mean low water, and there are several spots which are bare. Narrow slues traverse the shoal at intervals, through which from thirteen feet to five fathoms may be carried; but these passages are not safe for strangers. The northernmost of these crosses the shoal on a **W. by S.** and

Slues across Horse-Shoe Shoal. **E. by N.** course, at a distance of nearly two miles and three-quarters to the southeastward of the black buoy on the northwestern end, and has not less than thirteen feet water in it. It may be traversed with that depth of water by bringing Cape Poge Light-house to bear **SW. by W.** and steering for it; or, by bringing Bishop and Clerk's Light-house to bear **NE. by E. $\frac{1}{2}$ E.** and steering **SW. by W. $\frac{1}{3}$ W.**

The second slue, through which not less than four fathoms may be taken, crosses the shoal a little over a mile to the southeastward of the northern passage, and about three miles and three-quarters from the black buoy on the northwestern end of the shoal. It is, however, crooked; and not more than fifteen feet can be taken through it on a straight course. To carry this depth it is necessary to bring Cape Poge Light-house to bear **SW. by W. $\frac{1}{4}$ W.** and steer for it.

The middle slue is separated from the one just described by a shoal about a quarter of a mile wide and running in an **E. $\frac{1}{2}$ N.** and **W. $\frac{1}{2}$ S.** direction. It is eight hundred yards wide at its narrowest part, and not less than five fathoms may be taken through it by following the directions here given. Vessels should bring Bishop and Clerk's Light-house to bear **N. $\frac{3}{4}$ E.**, distant five miles, and Cross Rip Light-vessel **SW. $\frac{1}{2}$ W.**, distant three miles, when the depth will be eight fathoms, and the course **W. Southerly** through the slue, with not less than five fathoms, until Cross Rip Light-vessel bears **SE. by E. $\frac{1}{3}$ E.**, when the course may be shaped through the Main Channel either to the eastward or to the westward. This channel may be used in an emergency by strangers.

The southeastern slue runs in a nearly **N.** and **S.** direction between the southeastern extremity of the shoal proper and the broken ground to the eastward of it, and may be crossed with not less than four fathoms by bringing Bishop and Clerk's Light-house to bear **N.** by **E.** and steering **S. by W.** until Cross Rip Light-vessel bears **W. by N. $\frac{1}{3}$ N.** This is the widest of the passages across the Horse-Shoe,—being in no place less than three-quarters of a mile wide between the lines of three fathoms.

It may also be remarked that not less than thirteen feet may be taken across the shoal by bringing Cross Rip Light-vessel to bear **SW. $\frac{1}{2}$ W.** and steering for it.

The sailing-lines of the North Channel pass from three-eighths to three-quarters of a mile to the northward of the northern arm of the Horse-Shoe, and directions for avoiding this part of the shoal in contrary winds have been given above; but there are also *shoal spots on the northern side of this channel*, which should be carefully avoided by vessels of over six feet draught. These shoals lie in a line about S. by E. $\frac{1}{2}$ E. from the Deep Hole off Osterville, and extend over three miles and a quarter from the northern shore of Nantucket Sound,—the sailing-lines of the North Channel passing within seven hundred yards of the southernmost. This southern shoal is about a mile long in an E. and W. direction, and its shoalest part, which has ten feet, bears from Hyannis Light-house SW. $\frac{3}{4}$ W., six miles and one-eighth; from Bishop and Clerk's Light-house W. $\frac{1}{2}$ N., nearly six miles; and from Succonesset Shoal Light-vessel E. by N. $\frac{1}{2}$ N., nearly three miles distant. It is not buoyed, but is easily avoided by not going to the northward of Succonesset Shoal Light-vessel bearing W. by S. $\frac{1}{2}$ S. The shoal spots to the northward of this do not obstruct this channel.

When abreast of the black spar-buoy on the northwestern end of the Horse-Shoe a light-vessel will be seen to the northward of the course, bearing about W., and nearly two miles distant; and continuing the course to the southwestward, there will soon appear, about three points to the northward of the course and about a mile distant, a red spar-buoy, and a black spar-buoy a little to the southward of the course and about three-quarters of a mile off. The light-vessel is called Succonesset Shoal Light-vessel; the red buoy on the northern side is on Wreck Shoal, and the black buoy to the southward of the course is on Eldridge's Shoal.

Wreck Shoal, which has ten feet at mean low water, is a little over a mile and a quarter long in an ENE. and WSW. direction and nearly half a mile wide, with deep water on both sides of it, and a passage three-eighths of a mile wide, with over four fathoms, between it and Succonesset Shoal. The least water on this shoal (ten feet) is about midway between its eastern and western ends,—soundings on the other parts varying from twelve to fifteen feet,—and about a quarter of a mile to the southward of the shoalest spot is placed the buoy, which is a red spar, *Wreck Shoal.* No. 16, and bears from the black buoy on the northwestern end of the Horse-Shoe W. by N. $\frac{3}{4}$ N., a mile and a half, and from Succonesset Shoal Light-vessel E. by N., a little over half a mile distant. To avoid this shoal, when standing to the northward vessels should not cross the range of Succonesset Shoal Light-vessel and the buoy, when to the eastward of the latter; and, when to the westward of the buoy, should go about when the light-vessel bears W.

Eldridge's Shoal, which has six feet at mean low water at its shoalest part, lies NE. by E. and SW. by W. and is a little over half a mile long. The black spar-buoy mentioned above is marked No. 11, placed in eighteen feet water nearly four hundred yards to the northward of the shoalest part of the bar, and bears from the black buoy on the northwestern end of the Horse-Shoe W. $\frac{1}{2}$ S., one mile and a quarter, and from Succonesset Shoal Light-vessel SE. by E. $\frac{3}{4}$ E., distant nearly one mile. The sailing-lines pass to the northward of it at distances of from two hundred to four hundred yards. There is an excellent channel a mile wide, and with from four to eleven fathoms in it, between this shoal and the western end of the Horse-Shoe, and vessels may safely pass through it by bringing Succonesset Shoal Light-vessel to bear W. $\frac{3}{4}$ S., Hyannis Light-house NE. $\frac{1}{4}$ E., and steering SW. by W. $\frac{1}{2}$ W. until Nobska Point Light-house bears W. by N. $\frac{5}{8}$ N., or Succonesset Shoal Light-vessel NE. by N. $\frac{1}{2}$ N., when they will be in the northern part of the Main Channel and may steer for Nobska Point Light-house with safety. *Eldridge's Shoal.*

But vessels passing through the North Channel, when within a quarter of a mile of the black buoy on Eldridge's Shoal, alter their course to the westward, steering about W. $\frac{3}{4}$ N., so as to pass a little to the southward of Succonesset Shoal Light-vessel, which is placed half a mile S. by E. $\frac{1}{2}$ E. from the eastern end of Succonesset Shoal, and about three hundred yards to the southwestward of the western end of Wreck Shoal. It is a schooner-fitted vessel with one red hoop-iron day-mark, and its hull painted in alternate squares of red and cream-color,—the word "Succonesset" being painted in large letters on each side. She is moored in six fathoms, and shows a fixed white light from a height of forty feet above the sea, visible twelve miles. The approximate geographical position of this vessel is Latitude 41° 32' 12" N., Longitude 70° 26' 12" W., and it bears from *Succonesset Shoal Light-vessel.*

	Miles.
Hyannis Light-house, SW. by W. $\frac{1}{4}$ W. -----	nearly 9
Bishop and Clerk's Light-house, W. $\frac{1}{4}$ S. -----	8 $\frac{5}{8}$
Black Buoy on the northwestern end of the Horse-Shoe, W. by N., a little over	2
Black Buoy on the northwestern end of Eldridge's Shoal, NW. by W. $\frac{3}{4}$ W. -----	nearly 1
Cross Rip Light-vessel, NW. $\frac{1}{2}$ N. -----	8 $\frac{1}{2}$
Cape Poge Light-house, N. by E. $\frac{1}{2}$ E. -----	6 $\frac{3}{4}$
Edgartown Light-house, NE. by N. $\frac{1}{2}$ N. -----	9
East Chop Light-house, ENE. -----	a little over 7
Holmes' Hole Light-house, (West Chop,) E. by N. $\frac{1}{2}$ N. -----	about 8
Nobska Point Light-house, E. $\frac{3}{4}$ S. -----	nearly 10

A fog-bell is rung upon this vessel, during thick weather, at intervals not exceeding five minutes; and there is also a horn for use in case of necessity.

Succonesset Shoal is about a mile and a quarter long in a nearly **E.** and **W.** direction and has from five to sixteen feet water upon it. It lies to the southeastward of Succonesset Point,—its western end being about a mile from shore; but there is no safe passage inside of it,—shoal water making off from the point to within a quarter of a mile of its western end. On the eastern end of the shoal, in twenty feet water, is placed a red spar-buoy, No. 18,—a guide for vessels bound from Hyannis or Centreville to the westward, which are accustomed to pass between Wreck Shoal and Succonesset Shoal. The buoy bears from Succonesset Shoal Light-vessel nearly **N.** by **W.**, half a mile, and from the bell-buoy on West-Southwest Ledge **W.** by **S.** $\frac{1}{4}$ **S.**, six and three-quarter miles distant. Several shoal spots with fifteen and sixteen feet water lie off the southern side of Succonesset Shoal, about a third of a mile distant. The easternmost of these is a quarter of a mile **NW.** $\frac{1}{4}$ **W.** from the light-vessel, and the westernmost a little over half a mile **W.** $\frac{3}{4}$ **N.** from the same vessel. Vessels passing through the North Channel should, therefore, when in this vicinity, not go farther to the northward than to bring the light-vessel to bear **E.** $\frac{3}{4}$ **S.**, or Nobska Point Light-house **W.** $\frac{3}{8}$ **N.**

When to the westward of Succonesset Shoal Light-vessel there will soon appear, a little to the southward of the course, a spar-buoy, painted red and black in horizontal stripes. This is on the northern end of Small's Shoal, a detached shoal lying in a nearly **NE.** by **N.** and **SW.** by **S.** direction, about midway between Succonesset Shoal and the eastern end of L'Homme Dieu. It is about a quarter of a mile long and a hundred and fifty yards wide, with nine feet upon it at mean low water and from three to six fathoms on all sides of it. Vessels using the North Channel pass about three hundred yards to the northward of the buoy, which bears **W.** $\frac{1}{4}$ **S.** from Succonesset Shoal Light-vessel, a little over a mile and three-eighths distant. When up with this buoy the eastern end of L'Homme Dieu Shoal will bear **SW.** $\frac{1}{4}$ **S.**, seven-eighths of a mile distant.

L'Homme Dieu Shoal is an extensive piece of shoal ground extending in an **E.** by **S.** $\frac{1}{4}$ **S.** and **W.** by **N.** $\frac{1}{4}$ **N.** direction for four miles and a half, at an average distance from the northern shore of the Sound of a mile and a half. Although so long, it is in no place over half a mile wide, and both its eastern and western ends are marked by buoys. The shoalest part begins nearly midway of its length and extends to the westward for a mile and five-eighths, or to within half a mile of the western end, with from three to six feet water upon it; but soundings of from seven to eleven feet are found at intervals along the whole length of the shoal.

On the eastern end of L'Homme Dieu Shoal is placed a black spar-buoy (No. 13) in three fathoms water, which bears from

	Miles.
Succonesset Shoal Light-vessel, W. by S. $\frac{1}{8}$ S. -----	2 $\frac{3}{4}$
Succonesset Point, S. $\frac{1}{2}$ W. -----	nearly 2 $\frac{1}{4}$
Holmes' Hole Light-house, E. $\frac{1}{8}$ N. -----	5 $\frac{3}{4}$
East Chop Light-house, NE. by E. $\frac{1}{8}$ E. -----	4 $\frac{3}{4}$
Cape Poge Light-house, nearly N. $\frac{1}{4}$ W. -----	5 $\frac{3}{4}$

On the western end of L'Homme Dieu Shoal is placed a black can-buoy,* marked No. 15, which will be the first met with in the North Channel after passing the buoy on the eastern end. It is in four fathoms, and bears from the

	Miles.
Eastern buoy, W. by N. $\frac{1}{4}$ N. -----	about 4 $\frac{1}{2}$
Succonesset Shoal Light-vessel, W. $\frac{1}{8}$ N. -----	nearly 6 $\frac{1}{4}$
East Chop Light-house, N. $\frac{1}{4}$ E. -----	nearly 3
Holmes' Hole Light-house, NE. $\frac{3}{4}$ N. -----	2 $\frac{1}{2}$

If this buoy is made in thick weather, Nobska Point Light-house should bear **W.** $\frac{3}{4}$ **N.**, three miles and a half distant.

There should be placed, both on the northern and southern sides of L'Homme Dieu Shoal and near its middle, other buoys to mark projecting points, which have five and six feet water upon them, and which, at present, mariners have no guides for avoiding in thick weather. At night the rule is not to stand to the southward of Succonesset Shoal Light-vessel bearing **E.** $\frac{3}{4}$ **S.**, or Nobska Point Light-house **W.** $\frac{3}{8}$ **N.** This avoids the northern side of the shoal and is safe for the largest vessels.

The northern shore of Vineyard Sound, from Succonesset Point to abreast of the entrance to Waquoit Bay, should not be approached nearer than five-eighths of a mile by large vessels, to avoid the shoals which extend off to distances varying from a quarter to a little over half a mile. Succonesset Point itself should not be approached nearer than a mile from any direction, as there is a long shoal with four feet water making off from it to the southeastward.

To the westward of Waquoit Bay, vessels should keep about five-eighths of a mile from the shore, or should not go to the northward of Nobska Point Light-house bearing $W. \frac{1}{2} S.$ until nearly up with the western end of L'Homme Dieu Shoal, when a red spar-buoy will be made to the northward of the course, about three-quarters of a mile to the eastward of Falmouth Harbor. This is on Davis' Neck Shoal, a flat with from seven to nine feet, making off from **Davis' Neck** (on the eastern side of Falmouth Harbor) for half a mile. The buoy is marked No. 20, and is placed in three fathoms to the southward of the shoal; but vessels of large draught should not approach it nearer than a quarter of a mile, or, in other words, should not go to the northward of Nobska Point Light-house bearing $W. \frac{1}{2} S.$ This buoy bears from

Davis' Neck Shoal.

	Miles.
Nobska Point Light-house, E. $\frac{3}{4} N.$	3 $\frac{2}{3}$
Holmes' Hole Light-house, N NE.	3 $\frac{1}{4}$
Succoneset Shoal Light-vessel, W. by N.	6 $\frac{2}{3}$
Black buoy on the western end of L'Homme Dieu Shoal, N. by W., a little over	1

When nearly up with the western end of L'Homme Dieu Shoal the course turns to the southward, and the North, Middle and South channels unite at a point about a mile and a half to the westward of the black buoy. A straight course, nearly $W SW.$, now leads safely through the Sound and up with the light-vessel off Sow and Pigs Reef, whence the course may be shaped for Narragansett Bay, Point Judith, or to clear the southern end of Block Island. On this course through the Sound the channel is clear and the north shores steep-to, and vessels may approach any of the islands on this side within three hundred and fifty yards with perfect safety. In standing to the southward, however, on a wind it will be necessary to look out for **The Middle Ground**, a long and very narrow shoal, extending in about an $E.$ by $N.$ and $W.$ by $S.$ direction for four miles and a half. Its eastern end begins about six hundred yards $NW. \frac{1}{2} W.$ from West Chop, with the light-house bearing nearly $SE.$, half a mile distant. A good channel, with from four to fourteen fathoms in it, exists between this shoal and the northern shore of Martha's Vineyard; but, although quite safe for vessels drawing eighteen feet, it is rarely used.

The Middle Ground.

The eastern end of **The Middle Ground** has ten feet upon it, and is marked by a can-buoy* of the second class, painted red and black in horizontal stripes. This buoy bears from

	Miles.
Holmes' Hole Light-house, NW.	$\frac{1}{2}$
Nobska Point Light-house, SE. $\frac{3}{4} S.$	2 $\frac{2}{3}$
Black buoy on the western end of L'Homme Dieu Shoal, SW.	2 $\frac{1}{2}$
Horizontally-striped buoy on the western end of Hedge Fence Shoal, W. by S. $\frac{1}{2} S.$	a little over 2
Cross Rip Light-vessel, W. by N. $\frac{3}{4} N.$	14 $\frac{1}{2}$
Tarpaulin Cove Light-house, E. $\frac{3}{8} S.$	6 $\frac{2}{3}$

From this buoy the buoy on the western end of **The Middle Ground** bears $W. \frac{7}{8} S.$, four miles and a half distant.

From the buoy on the eastern end of the shoal soundings of from two to ten feet extend to the westward about a mile, after which the depths on the shoal vary between six and ten feet for about a mile and a quarter still farther to the westward. Here **The Middle Ground** is crossed by a *stue a mile and a quarter wide with thirteen feet in it*, which may be safely crossed with not less than that depth by bringing Nobska Point Light-house to bear $N NE.$ and steering either $N NE.$ or $S SW.$, according as it is intended to cross from the northern or the southern side of the Sound. Soundings of from nine to fourteen feet are found in spots, from the buoy on the western end of the shoal to a point about a mile and a quarter to the eastward; but about three-quarters of a mile to the eastward of this buoy there is *another stue with three fathoms*, which may be crossed from $E.$ to $W.$ with Tarpaulin Cove Light-house bearing $W.$ by $N. \frac{3}{8} N.$, and from $N.$ to $S.$ with Nobska Point Light-house bearing $NE.$ by $N.$ Easterly. Strangers, however, should never attempt to use these passages.

The western end of the shoal is marked by a nun-buoy of the second class, painted red and black in horizontal stripes, placed in three and a quarter fathoms.

The Middle Ground is in no place over two hundred and fifty yards wide, and the usual sailing-line passes seven-eighths of a mile to the northward of it. In standing to the southward on a wind, when to the eastward of the middle of the shoal, vessels should go about as soon as Tarpaulin Cove Light-house bears $W.$; and when to the westward of Nobska Point Light-house bearing $N. \frac{1}{4} E.$, they should use the lead frequently and go about as soon as they strike eight fathoms. When Nobska Point Light-house bears $NE. \frac{1}{8} E.$ they are clear of the western end, and when Holmes' Hole Light-house bears $S.$ by $E. \frac{1}{2} E.$ they are clear of the eastern end.

In standing to the northward, close to Nobska Point, a red spar-buoy will be seen close in with the point, but to the eastward of it. This is on Nobska Point Ledge, a rocky reef which makes off to the eastward from the shore at the base of the light-house, and is dangerous only to vessels standing very close to the point. The buoy is marked No. 22, and is placed in sixteen feet water on the eastern side of the ledge.

When to the westward of the western end of The Middle Ground vessels may stretch safely from shore to shore of the Sound, with Tarpaulin Cove Light-house bearing anywhere *Lucas' Shoal.* between NW. by W. and N. by W. $\frac{2}{3}$ W.; but, when to the westward of the latter bearing, it will be necessary to look out for Lucas' Shoal, a detached shoal with fourteen feet at mean low water, lying in an E. by N. $\frac{1}{2}$ N. and W. by S. $\frac{1}{2}$ S. direction, and about a quarter of a mile long. The centre of the shoal bears from

	Miles.
Tarpaulin Cove Light-house, S. $\frac{3}{4}$ E.-----	2 $\frac{1}{2}$
Cedar-tree Neck, W. $\frac{1}{4}$ N.-----	1 $\frac{3}{4}$
Holmes' Hole Light-house, W. by S. $\frac{1}{2}$ S.-----	7
Vineyard Sound Light-vessel, E. $\frac{1}{4}$ N.-----	11 $\frac{1}{2}$
Gay Head Light-house, NE. $\frac{3}{4}$ E.-----	6 $\frac{3}{8}$

The shoal is marked by a can-buoy* of the second class, painted red and black in horizontal stripes, and placed close to the shoalest water.

Vessels standing over towards the Vineyard shore, between the western end of The Middle Ground and Lucas' Shoal, must beware, when nearing Cedar-tree Neck, of Norton's Rock, a detached rock, with nine feet at mean low water, lying two hundred and fifty yards from the shore. It is not buoyed, but is easily avoided by keeping a quarter of a mile from shore at Cedar-tree Neck, or by not going to the eastward of Nobska Point Light-house bearing NE. $\frac{3}{4}$ N.

When to the westward of Lucas' Shoal, the channel is clear from shore to shore except for a *small spot with eighteen feet upon it*, which lies one mile SW. by W. $\frac{3}{4}$ W. from Lucas' Shoal buoy and three miles S. by W. westerly from Tarpaulin Cove Light-house. When in its vicinity it may be avoided by not going to the eastward of Tarpaulin Cove Light-house bearing N. by E. $\frac{1}{2}$ E., or to the southward of Gay Head Light-house bearing SW. $\frac{1}{4}$ W.

On the northern side of Gay Head there lies a very dangerous, ragged reef, a large portion of which is bare at low water, and which extends out nearly five-eighths of a mile from land. This is called The Devil's Bridge. In southerly and westerly gales the sea breaks with great violence over this reef and may be heard at a considerable distance; but the shoal is only dangerous in thick weather, or to vessels standing close in to Gay Head. A black nun-buoy of the second class, marked No. 25, is placed in five fathoms water on the extreme northwestern end of the shoal.

When past Gay Head, a light-vessel will soon appear to the northward of the course and about five miles off. This is Vineyard Sound Light-vessel, which is placed a mile to the southwestward of the Sow and Pigs Reef and marks the western entrance to Vineyard Sound. The vessel has two masts, with red hoop-iron day-mark at each mast-head, and the hull painted red with a yellow streak. The name "Vineyard Sound" is painted in black letters on each side. Two fixed white lights are shown from a height of thirty-four feet above the sea, visible eleven miles. In thick weather a first-class steam fog-whistle gives blasts of six seconds' duration at intervals of forty-five seconds. The approximate geographical position of this light-vessel is

Latitude ----- 41° 23' 00'' N.
Longitude ----- 70° 59' 25'' W.,

and its bearings and distances are as follows: From

	Miles.
Block Island Southeast Light-house, E. by N. $\frac{1}{2}$ N.-----	28 $\frac{3}{4}$
Block Island North Light-house, E. $\frac{3}{4}$ N.-----	28
Point Judith Light-house, E. $\frac{3}{4}$ S.-----	22 $\frac{1}{2}$
Brenton's Reef Light-vessel, (eastern entrance to Narragansett Bay,) E. by S. $\frac{3}{4}$ S.-----	17 $\frac{3}{8}$
Beaver-Tail Light-house, (entrance to Narragansett Bay,) E SE.-----	18 $\frac{1}{2}$
Hen and Chickens Light-vessel, (entrance to Buzzard's Bay,) S. by E. Southerly-----	3 $\frac{3}{4}$
Cuttyhunk Light-house, SW. by W. Southerly-----	2 $\frac{1}{2}$
Gay Head Light-house, NW. by W. $\frac{1}{2}$ W.-----	7 $\frac{1}{4}$

Sow and Pigs Reef makes off from the western end of Cuttyhunk Island in a nearly W SW. direction for a mile and three-eighths and is bare in several places at mean low water. There are also

a number of boulders, which are always out, scattered along its length. On its western end, a mile and a half **W SW.** from Cuttyhunk Light-house, is placed a can-buoy of the first class, painted red and marked No. 2, with the words "*Sow and Pigs*" on its head. This is a guide to Buzzard's Bay; and vessels may enter that bay from Vineyard Sound by passing between this buoy and the light-vessel, through a passage nearly a mile wide, with not less than eight fathoms water. The buoy bears from Vineyard Sound Light-vessel **NE. $\frac{3}{8}$ N.**, nearly one mile distant, and from Hen and Chickens Light-vessel **SE. by S. $\frac{7}{8}$ S.**, nearly three miles and a quarter distant.

Sow and Pigs Reef.

To the westward of Sow and Pigs Reef there are no dangers.

SAILING DIRECTIONS

FOR COASTING THE EAST SHORE OF CAPE COD AND PASSING THROUGH NANTUCKET AND VINEYARD SOUNDS BY THE NORTH CHANNEL.

I. *From Boston, crossing the Broken Part of Pollock Rip.*—With Boston Light-house bearing **NW. by W. $\frac{1}{4}$ W.**, one mile distant, the course across Massachusetts Bay is **SE. by E. $\frac{1}{4}$ E.** for thirty-five miles; or, until Race Point bears **W SW. Southerly**, distant four miles and three-quarters, and Highland Light-house **SE. by S. $\frac{2}{3}$ S.**, distant nearly six miles and a half. The depth will be twenty-three fathoms, and the course thence, in good weather, will be **SE. $\frac{1}{2}$ S.** for six miles and a half, until Highland Light-house bears **SW. by W. $\frac{1}{2}$ W.**, a mile and a half distant. On this course the least depth is thirteen fathoms, and when the light is brought to bear as above, there will be fourteen fathoms. Thence the course is **S. by E. $\frac{1}{4}$ E.** for a little over twelve miles, keeping not less than three-quarters of a mile from the beach, and carrying not less than six and a half fathoms, until the middle tower of the Nauset Beacons bears **SW. by W. $\frac{3}{4}$ W.**, distant one mile and seven-eighths; when the depth will be twelve fathoms, and the course, **S. $\frac{1}{4}$ W.** for a little over twenty-seven miles, will lead clear of danger to the Southern or Main Entrance to Nantucket Sound. *But, vessels intending to cross Pollock Rip do not prolong the S. $\frac{1}{4}$ W. course for more than fourteen miles, or until the southernmost of the Chatham Light-houses bears W. by N. $\frac{1}{2}$ N., about four miles distant, with a depth of ten fathoms; whence the course is **SW. by S. $\frac{2}{3}$ S.** for nearly seven miles, to Pollock Rip Light-vessel, carrying not less than three and a quarter fathoms through the slue.*

Or, the S. $\frac{1}{4}$ W. course may be continued until the southernmost of the Chatham Light-houses bears **NW. $\frac{1}{2}$ W.**, whence the course for Pollock Rip Light-vessel will be **SW. by S.**, carrying not less than three and a quarter fathoms.

Or, on the S. $\frac{1}{4}$ W. course from abreast of Nauset Beacons, when Chatham Light-houses bear **SW. by W. $\frac{1}{2}$ W.**, four and a half miles distant, **SW. by S. $\frac{1}{3}$ S.** may be steered, which will lead directly for the red nun-buoy (No. 4) on the southeastern end of the Main Portion of Pollock Rip. This course, however, is not recommended to strangers, who would be apt to become bewildered by the conflicting currents and might be set on to the Rip. Bringing the light-vessel to bear as above mentioned and steering for it will enable one to cross the slue with safety notwithstanding the currents.

From Pollock Rip Light-vessel the course is **W. by N.**, three and a half miles, for Shovelful Light-vessel, on which course, when within a mile and a quarter of the latter, there will be seen to the northward of the course, bearing about **NW. $\frac{3}{4}$ W.**, seven-eighths of a mile off, the striped can-buoy on the shoal in mid-channel north of Stone-Horse Shoal. Vessels pass well to the southward of this buoy, carrying not less than six fathoms; and when up with Shovelful Light-vessel steer **SW. by W. $\frac{1}{2}$ W.** for Handkerchief Light-vessel. On this course there is not less than seven fathoms. It is usual to pass on the north side of Handkerchief Light-vessel, and thence the course by the North Channel is **NW. $\frac{1}{4}$ W.**, with Bishop and Clerk's Light-house a little to the southward of the course. The least water will be three and a quarter fathoms; and the course continued past Bishop and Clerk's Light-house leads safely through this channel until Hyannis Light-house bears **N. $\frac{1}{4}$ W.**, when the depth will be five and a quarter fathoms, and the course **W. by S. $\frac{3}{4}$ S.** to pass between Eldridge's Shoal and Succonesset Shoal Light-vessel and on the northern side of the Horse-Shoe. There is not less than three and three-quarter fathoms on this course, and it should be continued until Succonesset Shoal Light-vessel bears **W. by N. $\frac{3}{4}$ N.**, one mile distant, and Cape Poge Light-house **SW. by S. $\frac{1}{2}$ S.**, when the depth will be four fathoms, a quarter of a mile to the eastward of the black buoy on Eldridge's Shoal. Thence the course is **W. $\frac{1}{4}$ N.**, passing two hundred and fifty yards to the southward of Suc-

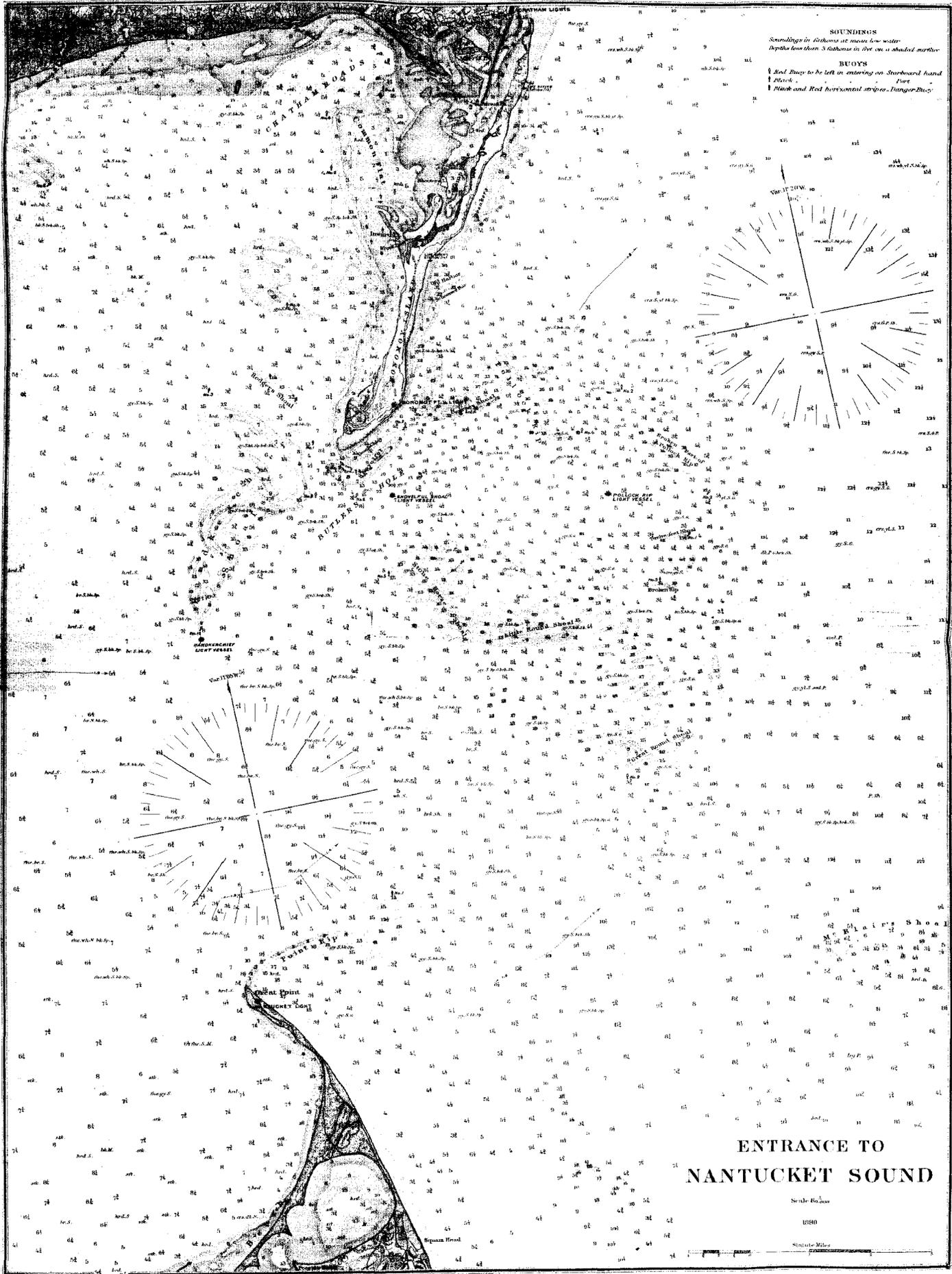
Sailing Directions---North Channel. connesset Shoal Light-vessel and to the northward of Small's Shoal and L'Homme Dieu Shoal, with not less than five fathoms water. On this course, when nearly up with the black buoy on the western end of L'Homme Dieu Shoal, in twelve fathoms, with Nobska Point Light-house bearing **W.** and Holmes' Hole Light-house **SW. $\frac{3}{4}$ S.**, the course through Vineyard Sound is **W.** by **S. $\frac{3}{4}$ S.**, which clears all dangers, and carries not less than nine fathoms after passing to the westward of Nobska Point Light-house. On this course, when Vineyard Sound Light-vessel bears **NW. $\frac{3}{4}$ W.**, nearly two miles, Cuttyhunk Light-house **N. $\frac{3}{8}$ E.**, two and five-eighths miles, and Gay Head Light-house **SE. by E. $\frac{3}{4}$ E.**, five and a quarter miles distant, the depth will be eleven fathoms, and a **W. by S. $\frac{3}{4}$ S.** course will lead clear of the southern end of Block Island; **W. $\frac{3}{8}$ N.** will lead into Block Island Sound within one mile of Point Judith; and **WNW.** will lead up to Brenton's Reef Light-vessel at the entrance to Narragansett Bay.

For vessels coming from the *westward* it is, of course, only necessary to *reverse* the above courses.

The above courses pass half a mile to the eastward of the bell-buoy on Harding's Ledge; a mile and a quarter to the eastward of Minot's Ledge Light-house; a mile and a half to the eastward of Highland Light-house; two miles to the eastward of the Whistling Buoy off Chatham Bar; from four hundred yards to half a mile to the eastward of the red nun-buoy (No. 2) on the eastern end of the detached shoal between Pollock Rip and its Broken Part; three hundred yards to the westward of the Broken Part of Pollock Rip; five-eighths of a mile to the eastward of the red nun-buoy (No. 4) on the southeastern end of Pollock Rip; nearly three-quarters of a mile to the northward of the most northerly of the outlying rips off Great Round Shoal; a mile and three-eighths to the southward of Bearse's Shoal; three-eighths of a mile to the northward of the seventeen-foot spot north of Stone-Horse Shoal; six hundred yards to the southward of the striped can-buoy on the "eighteen-foot spot;" nearly half a mile to the eastward of Shovelful Shoal; three-eighths of a mile to the eastward, and the same distance to the southward, of the southern end of The Handkerchief; a quarter of a mile to the southward of the shoal spots **S.** of Senator Shoal; nearly half a mile to the northward of Bishop and Clerk's Light-house; one hundred and fifty yards to the southward of Hallet's Rock; four hundred yards to the northward of the northern end of Hyannis Middle Ground; five-eighths of a mile to the southward of the buoy on West-Southwest Ledge; three-quarters of a mile to the southward of Hodges Rock; three-eighths of a mile to the southward of the southernmost shoal spot off Oster-ville; nearly half a mile to the northward of the black buoy on the northwestern end of the Horse-Shoe; half a mile to the southward of Wreck Shoal; a quarter of a mile to the northward of Eldridge's Shoal; two hundred yards to the southward of Succonesset Shoal Light-vessel; three hundred yards to the southward of the sixteen-foot spot **S.** of Succonesset Shoal; three-eighths of a mile to the southward of Succonesset Shoal; three hundred yards to the northward of Small's Shoal; a mile to the northward of the black buoy (No. 13) on the eastern end of L'Homme Dieu Shoal; three-eighths of a mile to the northward of the five-foot spot on the middle, and the same distance to the northward of the black buoy (No. 15) on the western end of L'Homme Dieu Shoal; five-eighths of a mile to the southward of Davis' Neck Shoal; three-quarters of a mile to the northward of The Middle Ground; a mile and a half to the northward of Lucas' Shoal; and nearly two miles to the southward of Sow and Pigs Reef.

On the above courses, to enter Chatham Roads.—1. **To the Westward of Handkerchief Shoal.**—From Handkerchief Light-vessel the course is **NW.** by **N. $\frac{3}{4}$ N.** along the western edge of The Handkerchief for about a mile, until Monomoy Point Light-house bears **NE. by E. $\frac{1}{4}$ E.** and Shovelful Light-vessel **E. by N. $\frac{1}{4}$ N.**, when the depth will be five fathoms, and **N. by E. $\frac{1}{2}$ E.** will lead, with not less than four fathoms, to abreast of the black buoy on the northwestern end of The Handkerchief. When this buoy is abeam and about a quarter of a mile off, **NE. by N. $\frac{1}{4}$ N.** must be steered, following the directions for the Roadstead.

2. **To pass between The Handkerchief and Monomoy Point.**—From Shovelful Light-vessel continue the course **W. by N.** for about a mile, or until Monomoy Point Light-house bears **NE.**, when the depth will be seven and a half fathoms and you will be exactly in the entrance to this channel. Now steer **N. $\frac{1}{2}$ W.** for about three-eighths of a mile, which will bring you, with not less than eight fathoms, to the red spar-buoy on the western end of Shovelful Shoal, and Monomoy Point Light-house will bear **NE. $\frac{3}{8}$ E.** Now steer **N. $\frac{1}{4}$ E.**, and follow the directions given for the Roadstead.



SOUNDINGS
 Soundings in fathoms at mean low water
 Depths less than 5 fathoms in five or a shaded surface

BUOYS
 Red Buoy to be left in entering on Starboard hand
 Black Buoy to be left in entering on Port hand
 Black and Red horizontal stripes Danger Buoy

**ENTRANCE TO
 NANTUCKET SOUND**

Scale of Fathoms
 1880

Hydrographic Office
 London

On the above courses, to enter Bass River Roadstead.—From Handkerchief Light-vessel steer **NW. $\frac{1}{4}$ W.** for a little over half a mile, or until Monomoy Point Light-house bears **NE. by E.** This clears the southern end of The Handkerchief, and the dwelling-house on the eastern side of the entrance to the river (the site of the old light-house) will bear **N. by W. $\frac{1}{4}$ W.** Steer for it, and follow the directions given for the Roadstead.

On the above courses, to enter Hyannis Roadstead.—Continue the **NW. $\frac{1}{4}$ W.** course through the North Channel, carrying not less than three and a quarter fathoms, until Hyannis Light-house bears **N. by E. $\frac{1}{4}$ E.**, when the black spar-buoy on The Southwest Ground will bear **W. $\frac{3}{8}$ N.**, three-eighths of a mile off. Steer for the light-house, and follow the directions for the Roadstead.

On the above courses, to enter Centreville Harbor.—On the course **W. by S. $\frac{3}{4}$ S.** from off Point Gammon, when you have passed the buoy on West-Southwest Ledge and Hyannis Light-house bears **NE. by N. $\frac{1}{2}$ N.**, three miles and five-eighths distant, the depth will be twenty-three feet and the course **NNW.** for two miles and a half, which will lead to the entrance to the harbor.

On the above courses, to enter the Deep Hole off Osterville.—When past the buoy on West-Southwest Ledge, and in three and a half fathoms, with Hyannis Light-house bearing **NE. by N.** and Bishop and Clerk's Light-house **E SE.**, steer **W. by N. $\frac{1}{4}$ N.**, which will bring you to the bell-buoy* on Lone Rock. Pass about three hundred and fifty yards to the northward of this buoy, and when it bears **S.**, anchor in fifteen and a half feet, hard bottom; or, steer **NNW.**, nearly for the eastern point of entrance to Osterville, anchoring in from seven to nine feet, according to draught.

DANGERS

IN APPROACHING, ENTERING AND PASSING THROUGH NANTUCKET AND VINEYARD SOUNDS BY THE NORTH CHANNEL.

II. From Boston by the Main Entrance to Butler's Hole, outside of Pollock Rip.—The entrance to this channel lies between the Broken Part of Pollock Rip on the north and a detached shoal, called Twelve Feet Shoal, on the south; and is five-eighths of a mile wide, with from three to five fathoms water. It is a very plain and easy channel by day or night, as the shoals at the entrance are buoyed, and the range of Pollock Rip and Shovelful Shoal light-vessels enables a vessel to pass safely through in spite of the strong currents.

The northern side of the entrance is guarded by a can-buoy of the first class, painted red, marked No. 2, and placed in about four fathoms water. This is on the southern end of the Broken Part of Pollock Rip, which is composed of a number of narrow ridges of hard sand extending in a northerly and northwesterly direction, with from twelve to sixteen feet water upon them. Between it and the Main Portion of Pollock Rip there exists a channel nearly seven-eighths of a mile wide, with from three to six fathoms water, much used by coasters who are acquainted with the shoals and the set of the currents, and which has been already described on page 90. The northern end of the Broken Part of the Rip bears **E. by S. $\frac{1}{2}$ S.** from Monomoy Point Light-house, distant four miles and a quarter, and from Pollock Rip Light-vessel **NE. $\frac{1}{2}$ N.**, distant one mile and an eighth. Its southern end bears from Monomoy Point Light-house **SE. by E. $\frac{1}{2}$ E.**, distant five miles and a half, and from the light-vessel **E. by S.**, distant one mile and five-eighths.

On the southern side of the entrance, three-quarters of a mile **SW. $\frac{1}{4}$ W.** from the buoy on the Broken Part of Pollock Rip, will be seen a nun-buoy of the second class, painted black and marked No. 1. This is on the eastern end of Twelve Feet Shoal, a narrow, detached shoal, lying **E. and W.**, half a mile long, two hundred and fifty yards wide in its widest part, and having its shoalest water—twelve feet—at its eastern end, close to the buoy. This buoy bears from Pollock Rip Light-vessel **SE. $\frac{3}{8}$ E.**, distant nearly a mile and a half, and from the red can-buoy on the southeastern end of the Broken Part of Pollock Rip **SW. $\frac{1}{4}$ W.**, distant three-quarters of a mile.

To the southward of the Twelve Feet Shoal, between it and Great Round Shoal, lie two detached shoals with from ten to fourteen feet water, known under the common name of *Broken Rip*; but they are not approached by vessels using this channel. On the northern side of the southernmost of these shoals, close to a fourteen-foot spot, is placed a black nun-buoy of the second class, marked No. 3, and bearing from Pollock Rip Light-vessel **S. by E. $\frac{1}{2}$ E.**, distant nearly a mile and three-quarters, and from the black buoy on Twelve Feet Shoal **SW. $\frac{1}{4}$ S.**, distant seven-eighths of a mile.

A mile and three-quarters to the westward of the red can-buoy on the southern end of the Broken Part of Pollock Rip lies Pollock Rip Light-vessel, in the middle of the channel; and beyond this the dangers and the sailing directions are the same as those just given for entering the North Channel by crossing the slue in Pollock Rip. (See pages 91–101 and 101–103.)

SAILING DIRECTIONS

FOR APPROACHING, ENTERING AND PASSING THROUGH NANTUCKET AND VINEYARD SOUNDS BY THE NORTH CHANNEL.

II. By the Main Entrance to Butler's Hole, outside of Pollock Rip.—The S. $\frac{1}{4}$ W. course from abreast of Nauset Beacons should be continued until Pollock Rip Light-vessel is brought to bear W. by N., when it will be in range with Shovelful Shoal Light-vessel and must be steered for, keeping the range. This course passes to the southward of Pollock Rip, between it and Twelve Feet Shoal, and carries not less than four and a half fathoms water. When up with Pollock Rip Light-vessel the course should be continued to Shovelful Light-vessel, and thence SW. by W. $\frac{1}{2}$ W. for Handkerchief Light-vessel, following the directions previously given for the North Channel.

These courses pass close-to, to the southward of the red can-buoy (No. 2) on the southeastern end of the Broken Part of Pollock Rip; nearly three-quarters of a mile to the northward of the black nun-buoy on the eastern end of Twelve Feet Shoal; seven-eighths of a mile to the southward of the southeastern end of the Main Portion of Pollock Rip; and five-eighths of a mile to the northward of the northernmost outlying shoal off Great Round Shoal.

To pass from the North Channel into the Middle Channel and go between L'Homme Dieu Shoal and The Hedge Fence.—When, on the NW. $\frac{1}{4}$ W. course from Handkerchief Light-vessel, Bishop and Clerk's Light-house bears SE. by S. $\frac{3}{4}$ S. and Hyannis Light-house N. $\frac{1}{4}$ W., with five and a quarter fathoms, as before, the course will be W. by S. $\frac{3}{4}$ S., passing between Eldridge's Shoal and Suconesset Shoal Light-vessel, and entering the Middle Channel nearly midway between the black buoy (No. 13) on the eastern end of L'Homme Dieu Shoal and the horizontally-striped buoy on the eastern end of The Hedge Fence. On this course there is not less than three and three-quarter fathoms; and when Nobska Point Light-house bears W. by N. $\frac{1}{2}$ N. Northerly, there will be ten fathoms; and the course for the light will lead safely through the Middle Channel to the southward of L'Homme Dieu Shoal with not less than six and a half fathoms.

Vessels using this passage will pass half a mile to the southward of Wreck Shoal; two hundred yards to the northward of the black buoy (No. 11) on Eldridge's Shoal; nearly five-eighths of a mile to the southward of Suconesset Shoal Light-vessel; about a mile to the southward of the buoy on Small's Shoal; half a mile to the southward of the black spar-buoy (No. 13) on the eastern end of L'Homme Dieu Shoal; and a mile and an eighth to the northward of the horizontally-striped buoy on the eastern end of The Hedge Fence.

To enter the North Channel to the Southward of Bishop and Clerk's Shoal.—When, on the NW. $\frac{1}{4}$ W. course from Handkerchief Light-vessel, Bishop and Clerk's Light-house bears NW. by W. Northerly, the depth will be between six and seven fathoms, and the course W. by N. will lead safely through to the southward of Bishop and Clerk's Shoal and Hyannis Middle Ground, and to the northward of the Horse-Shoe, with not less than four and three-quarter fathoms. On this course, when Suconesset Shoal Light-vessel bears W. $\frac{3}{4}$ S. and Hyannis Light-house NE. $\frac{1}{4}$ E., the depth will be eight fathoms, and the course W. by S. $\frac{3}{4}$ S., between Wreck Shoal and the Horse-Shoe, until Suconesset Shoal Light-vessel bears W. by N. $\frac{3}{4}$ N. and Cape Poge Light-house SW. by S. $\frac{3}{4}$ S., when W. $\frac{3}{4}$ N. will lead to the northward of L'Homme Dieu Shoal, following the directions given above.

Or, the W. by S. $\frac{3}{4}$ S. course may be continued until Cape Poge Light-house bears S. $\frac{1}{4}$ E., when W. by N. $\frac{1}{2}$ N. Northerly will lead through the Middle Channel to the southward of L'Homme Dieu Shoal.

Vessels using the above courses into the North Channel will pass six hundred yards to the southward of the red spar-buoy (No. 12) on the southern end of Bishop and Clerk's Shoal; one mile and an eighth to the southward of Bishop and Clerk's Light-house; a quarter of a mile to the southward of the broken ground W. of Bishop and Clerk's Shoal; an eighth of a mile to the southward of the seventeen-foot shoal to the westward of that broken ground; three quarters of a mile to the northward of the black spar-buoy (No. 7) on the broken ground off the northeastern arm of the Horse-Shoe; and three-eighths of a mile to the northward of the shoalest part of the northeastern arm of the Horse-Shoe.

This is a channel very frequently used by coasters. Those coming from the westward need only reverse the above courses.

DANGERS

IN ENTERING AND PASSING THROUGH NANTUCKET AND VINEYARD SOUNDS.

III. *By the Middle Channel.*—This channel begins on the southern side of the Horse-Shoe, at its eastern end, and the entrance to it is marked by a light-vessel known as Cross Rip Light-vessel. Thence it runs in a nearly **W N W.** direction for about nine miles to a point nearly midway between the buoys on the eastern ends of L'Homme Dieu Shoal and The Hedge Fence. Thence, turning slightly to the westward, it continues for five and a half miles between these two shoals, and joins the North Channel at a point about two miles to the eastward of Nobska Point Light-house. This channel may be entered from the northward either through Butler's Hole, following the courses as above described for the North Channel, or through the South or Main Entrance to Nantucket Sound, between Great Round Shoal and Point Rip. In the former case the dangers as far to the westward as Handkerchief Light-vessel are identical with those described on pages 90-93 and 103, in the description of dangers in the passage through Butler's Hole. They need not, therefore, be repeated here.

From Handkerchief Light-vessel the course to the entrance of the Middle Channel is **W. $\frac{3}{4}$ S.** for between eight and nine miles, which leads up to the Broken Ground to the eastward of the southeastern end of the Horse-Shoe. This shoal, which has from thirteen to sixteen feet upon it, extends nearly **N N E.** and **S S W.**, at a distance from the southeastern end of the Horse-Shoe of a mile and three-eighths; and off its southern end is placed a red nun-buoy,* marked No. 12, which is a guide to the entrance to this channel, and bears from Handkerchief Light-vessel **W. $\frac{1}{2}$ S.**, eight and one-eighth miles distant, and from Cross Rip Light-vessel **E. $\frac{1}{3}$ S.**, two miles and three-eighths distant. The sailing-line passes three-eighths of a mile to the southward of it.

Broken Ground of the Horse-Shoe.

The channel is very wide to the eastward of Cross Rip, affording beating room of over two miles and a half; but in standing to the southward of this vicinity vessels must beware of going to the southward of Nantucket Light-house bearing **E. by S. $\frac{3}{4}$ S.**, or Cape Poge Light-house bearing **W. by N. $\frac{1}{4}$ N.**, to avoid the dangerous Tuckernuck Shoal, a sand shoal of very irregular shape, which extends first in a **W. $\frac{1}{4}$ S.** direction for nearly five miles, and then about **S. by E.** for two miles, nearly joining the extensive flat called *Tuckernuck Bank*, making off from Tuckernuck and Muskeget islands. As there is no safe passage between the shoal and the bank, these extensive sand bars may be considered as one; and vessels bound either to the eastward or westward should never attempt to pass to the southward of the bearings of Cape Poge and Nantucket lights given above.

Tuckernuck Shoal.

The soundings on Tuckernuck Shoal are very irregular,—six feet being found at its southwestern end, and soundings of from four to six feet extending from this point in about a **N N E.** direction for about a mile and a half along a very narrow ridge; while at its eastern end there is not less than ten feet, and near the middle of the northern part of the shoal from six to eight feet, and thence soundings varying all the way from eight to fifteen feet continue to its western end. To mark the southern limits of the Main Channel there is placed on the eastern side of this shoal a black nun-buoy* of the second class, marked No. 7, which bears from Handkerchief Light-vessel **SW. by W. Westerly**, seven miles and five-eighths, and from Cross Rip Light-vessel **SE. $\frac{1}{3}$ E.**, five and three-eighths miles distant. From this buoy to the red buoy on the southern end of the Broken Ground the bearing is **NW. by N. $\frac{3}{4}$ N.** and the distance three miles and three-quarters.

When up with the red buoy on the southern end of the Broken Ground the course turns a little more to the westward, and there will be seen ahead, and about two miles and a quarter distant, a schooner-rigged light-vessel with a white day-mark at each mast-head. This is Cross Rip Light-vessel, and is anchored in eight-fathoms, nearly midway between Horse-Shoe Shoal on the northern side and Cross Rip on the southern side of the channel. The vessel's hull is painted black with a white streak, and the words "*Cross Rip*" in white letters on each side; and from the mast-head is shown a fixed white light from a height of thirty-nine feet above the sea, visible twelve miles. Its approximate geographical position is

Cross Rip Light-vessel.

Latitude ----- 41° 26' 57'' N.
 Longitude ----- 70° 17' 30'' W.,

and it bears from

	Miles.
Cape Poge Light-house, E. $\frac{1}{4}$ N. -----	7 $\frac{1}{2}$
Holmes' Hole Light-house, E. by S. $\frac{3}{8}$ S. -----	a little over 14
Nobska Point Light-house, SE. by E. $\frac{7}{8}$ E. -----	17
Succoneset Shoal Light-vessel, SE. $\frac{1}{3}$ S. -----	8 $\frac{1}{4}$
Bishop and Clerk's Light-house, SW. by S. $\frac{1}{4}$ S. -----	nearly 7 $\frac{1}{2}$
Handkerchief Shoal Light-vessel, W. $\frac{1}{4}$ S. -----	10 $\frac{1}{2}$
The red nun-buoy (No. 12) on the Broken Ground of the Horse-Shoe, W. $\frac{1}{3}$ N. -----	2 $\frac{3}{8}$
Nantucket Light-house, NW. by W. $\frac{3}{4}$ W. -----	11 $\frac{1}{2}$

A bell is rung in foggy weather.

When nearly up with Cross Rip Light-vessel a black spar-buoy will be seen to the southward of it. This on the northern end of Cross Rip, the northernmost of the numerous detached shoals lying on the southern side of the Main Channel, between the western end of Nantucket and the eastern end of Chappaquiddick Island. Cross Rip has eleven feet upon it at mean low water, lies N. by W. and S. by E., and is three-quarters of a mile long. The buoy is marked No. 9, placed in three fathoms off the northern end of the shoal, and bears from

	Miles.
Cross Rip Light-vessel, SW. $\frac{1}{4}$ W. -----	$\frac{3}{8}$
Cape Poge Light-house, E. -----	7 $\frac{1}{4}$
Holmes' Hole Light-house, E. by S. $\frac{3}{4}$ S. ----- nearly	14
The red nun-buoy (No. 12) on the Broken Ground of the Horse-Shoe, W. $\frac{1}{8}$ S. -----	2 $\frac{5}{8}$
Nantucket Light-house, NW. by W. $\frac{1}{2}$ W. -----	11 $\frac{5}{8}$
Black buoy on eastern end of Tuckernuck Shoal, NW. $\frac{5}{8}$ W. -----	5 $\frac{1}{2}$

Strangers must never attempt to go to the southward of Cross Rip,—the whole space between the Rip and Tuckernuck and Muskeget islands being full of dangerous shoals. First, to the southward of Cross Rip is Edwards' Shoal, which lies three-quarters of a mile S. by W. $\frac{3}{4}$ W. from the southern end of Cross Rip, has ten feet at mean low water, and is not buoyed. The ten-foot *Edwards' Shoal.* spot on the shoal is on its eastern side, near the middle, and bears from Cross Rip Light-vessel S. by W., a little over two miles distant, and from the red nun-buoy (No. 12) on the Broken Ground of the Horse-Shoe SW. by W., three miles and a half distant. Between this shoal and Cross Rip there is a channel nearly three-quarters of a mile wide with from four to eleven fathoms; but it is not advisable for strangers to attempt it.

Next to the westward of Tuckernuck Shoal, and nearly joining its western end, lies a large sand shoal, called Shovelful Shoal, or *West Shovelful Shoal*, as it should be called, to distinguish it from the one of the same name on the northern side of Butler's Hole. Its eastern end begins *Shovelful Shoal.* four miles S. $\frac{3}{8}$ W. from Cross Rip Light-vessel and two hundred and fifty yards to the westward of the western end of Tuckernuck Shoal, from which point it extends about W. $\frac{1}{2}$ S. for a mile and seven-eighths; and then, turning abruptly at right angles, runs N. $\frac{3}{4}$ E. for three-quarters of a mile. Soundings of from four to five feet are found along nearly the whole length of this shoal. It is not buoyed, but is not in the way of vessels passing through either the Main or Middle channels, and is only described as one of the line of shoals which extends from Cape Poge to the eastern end of Tuckernuck Shoal. A depth of four fathoms exists between its eastern end and the western end of Tuckernuck Shoal, and from three to six fathoms between its western end and Long Shoal, the next of the series to the westward.

Long Shoal is a sand bar of irregular shape, having a general direction about NE. and SW. and a length of two miles and a quarter. Its southern extremity begins about a quarter of a mile to the westward of the West Shovelful, with Cross Rip Light-vessel bearing NE. $\frac{3}{4}$ N.; and here there is found thirteen feet. From this point it runs, first, NW. by W. for a mile, with soundings varying from six to eleven feet, and then with an abrupt turn runs NE. for a little over two miles,—the depths ranging from two to seven feet at mean low water. On *Long Shoal.* this northern end is placed, in three fathoms, a red spar-buoy (No. 6), which is intended as a guide for vessels using the Muskeget Channel. This buoy bears from Cross Rip Light-vessel SW. $\frac{3}{8}$ W., two miles and three-quarters; from the ten-foot spot on Edwards' Shoal W. $\frac{3}{4}$ N., a mile and five-eighths; and from Cape Poge Light-house E. by S. $\frac{1}{2}$ S., five and a half miles distant.

The channel between the southern end of Long Shoal and the West Shovelful is in no place less than a quarter of a mile wide, with from three to six fathoms. To the westward, between it and Hawes' Shoal, the channel is a mile and a quarter wide, with from five to eight fathoms, and is used by vessels which have come through the Muskeget Channel bound to the eastward. Between the red buoy (No. 6) on its northern end and the southeastern end of Norton's Shoal, the channel has from four to ten fathoms and is three-eighths of a mile wide.

Norton's Shoal lies on the southern side of the Main Channel, but is not in the way unless a vessel is standing to the southward on a wind. It is a sand shoal with ten feet water, extending W. by N. and E. by S., and is a mile and three-quarters long. A nun-buoy* of the second class, *Norton's Shoal.* painted black, and marked No. 11, is placed on its northern side, about midway of its length, in four fathoms water, and bears from Cross Rip Light-vessel W. by S. $\frac{1}{8}$ S., nearly three miles distant, and from Cape Poge Light-house E. $\frac{3}{8}$ S., four miles and five-eighths distant. From this buoy the black buoy (No. 13) on the northwestern end of Hawes' Shoal bears W. $\frac{3}{4}$ N., distant three miles, and the black buoy (No. 15) off Cape Poge W. by N. $\frac{1}{4}$ N., distant a little over four miles and a quarter.

To avoid Norton's Shoal vessels should not stand to the southward of Cross Rip Light-vessel bearing E. $\frac{1}{4}$ N., or Cape Poge Light-house W. $\frac{1}{4}$ S.

Next to the westward of Norton's Shoal, and almost joining it, lies Hawes' Shoal, a very extensive piece of shoal ground of triangular shape, which extends from **E.** to **W.** for two miles and five-eighths and from **N.** to **S.** two miles and three-quarters. Over this large area soundings varying from four to sixteen feet are found; but the most dangerous portions of the shoal are on its southeastern and western sides and at its northwestern end. On its southeastern side, about *Hawes' Shoal.* midway between the northeastern and southwestern ends, are found soundings of from four to six feet, covering a space over a mile long in an **E NE.** and **W SW.** direction, with Cape Poge Light-house bearing between **NW. $\frac{1}{4}$ N.** and **NW. by W. $\frac{3}{4}$ W.;** but this part of the shoal is not in the way of vessels using the Middle or Main Channel. On the northwestern end there is placed, in three fathoms water, a black spar-buoy (No. 13), which bears from

	Miles.
Cape Poge Light-house, E. $\frac{1}{4}$ N. -----	1 $\frac{5}{8}$
The black buoy off Cape Poge, E SE. Southerly -----	1 $\frac{5}{8}$
Succonesset Shoal Light-vessel, S. $\frac{1}{8}$ W. -----	nearly 6 $\frac{1}{2}$
The red buoy on the southwestern side of the Horse-Shoe, SW. Westerly -----	4
Cross Rip Light-vessel, W. $\frac{1}{8}$ S. -----	5 $\frac{3}{4}$
The black buoy on Norton's Shoal, W. $\frac{3}{4}$ N. -----	nearly 3

There is also a red spar-buoy (No. 4) placed on the southwestern end of Hawes' Shoal, two miles and five-eighths to the southward of the northwestern buoy and the same distance **S.** by **E. $\frac{1}{8}$ E.** from Cape Poge Light-house. It is intended to mark the Muskeget Channel, and is not seen by vessels passing through the Main or Middle Channel.

In beating, to avoid Hawes' Shoal, vessels should not stand to the southward of Cape Poge Light-house bearing **W. $\frac{1}{2}$ S.,** or Cross Rip Light-vessel **E.**

At Cross Rip Light-vessel the Middle Channel turns slightly to the northwestward, running along the southern side of Horse-Shoe Shoal for nearly five miles. This dangerous shoal, before described, (see pages 95-96 and 105,) is composed entirely of hard sand, and is dry in several places at mean low water. It receives its name from its shape, which is somewhat that of a horse-shoe; but its southern arm, which obstructs the Middle Channel, is much longer than the northern one. This part of the shoal may be said to begin, for a vessel coming from the eastward, at the *Broken Ground of the Horse-Shoe,* lying a mile and three-eighths to the southeastward of the southeastern end of the main body of the shoal; and here is placed a red nun-buoy* (No. 12) to mark the northern limits of this channel. From this buoy the shoal of the Broken Ground extends nearly **N NE.** for a mile and an eighth, with from thirteen to sixteen feet water upon it. Cross Rip Light-vessel bears from this buoy **W. $\frac{1}{4}$ N.,** distant two and three-eighths miles.

Horse-Shoe Shoal.

A *slue channel* with from four to eight fathoms water, and in no place less than three-quarters of a mile wide, separates the Broken Ground of the Horse-Shoe from the main body of the shoal. Its general direction is **N.** and **S.,** and it may be crossed, with not less than four fathoms, by bringing Bishop and Clerk's Light-house to bear **N.** by **E.** and steering **S.** by **W.** until Cross Rip Light-vessel bears **W.** by **N. $\frac{1}{4}$ N.**

The depth along the southern arm of the Horse-Shoe varies from one to sixteen feet at mean low water, and there are several spots which are bare. Narrow slues traverse the shoal at intervals, through which from thirteen feet to five fathoms may be carried; but these passages are not safe for strangers. (See also page 96.)

The southeastern extremity of the main body of the shoal begins one mile **E. $\frac{1}{4}$ N.** from Cross Rip Light-vessel, and about a mile and three-eighths to the westward of the red nun-buoy (No. 12) on the southeastern end of the Broken Ground. Thence its course is **NW.** by **W. $\frac{1}{2}$ W.** for two miles, and then **NW.** by **W.** nearly for two and a half miles, where is placed a red nun-buoy* (No. 14), marking the northern limits of this channel. From this buoy its course is **NW.** by **N.** for a little over two miles and a quarter, and then **N NE.** Easterly to the northwestern extremity or "toe" of the shoe;—its entire length from the red nun-buoy (No. 12) on the southeastern end of the Broken Ground to its termination at the "toe" being eight miles and three-quarters. Vessels should not approach this southern side of the shoal nearer than to bring Cross Rip Light-vessel to bear **SE. $\frac{1}{2}$ E.** until up with the red nun-buoy (No. 14) mentioned above, or until Cape Poge Light-house bears **SW.** by **W.** When past the buoy they should not stand to the northward of Succonesset Shoal Light-vessel bearing **NW.** by **N. $\frac{1}{4}$ N.** Following these directions, they will in no case find less than three and a half fathoms.

The course through the Middle Channel continues to the westward until Cape Poge Light-house bears **S. $\frac{1}{4}$ E.,** or Succonesset Shoal Light-vessel **NE. $\frac{1}{4}$ E.,** when it becomes necessary to look out on the north side for L'Homme Dieu Shoal, and on the south side for The Hedge Fence. The eastern end of each shoal is marked by a buoy, which, from the above bearing of Succonesset Shoal Light-vessel, should be visible. That on the eastern end of L'Homme Dieu Shoal is a black spar, marked No. 13, and placed in three fathoms water; that on the eastern end of The Hedge Fence is a nun-buoy* of the third class, painted red and black in horizontal stripes, and placed in three and a half fathoms.

L'Homme Dieu Shoal extends in an **E.** by **S.** $\frac{1}{4}$ **S.** and **W.** by **N.** $\frac{1}{4}$ **N.** direction for four miles and a half, at an average distance from the north shore of the Sound of one and a half miles, and is in no place over half a mile wide. The shoalest part begins nearly midway of its length, and extends to the westward for a mile and five-eighths, or to within half a mile of the western end, with from three to six feet water upon it; but soundings of from seven to eleven feet are found at intervals along the whole length of the shoal. The buoy on the eastern end of L'Homme Dieu Shoal bears from

	Miles.
Succoneset Shoal Light-vessel, W. by S. $\frac{1}{8}$ S. -----	2 $\frac{1}{3}$
Succoneset Point, S. $\frac{1}{2}$ W. -----	nearly 2 $\frac{1}{4}$
Holmes' Hole Light-house, E. $\frac{1}{8}$ N. -----	5 $\frac{3}{4}$
East Chop Light-house, NE. by E. $\frac{1}{8}$ E. -----	4 $\frac{3}{4}$
Cape Poge Light-house, nearly N. $\frac{1}{4}$ W. -----	5 $\frac{3}{4}$

On the western end of the shoal is placed a black can-buoy,* marked No. 15, in four fathoms water, bearing from

	Miles.
The eastern buoy, W. by N. $\frac{1}{4}$ N. -----	about 4 $\frac{1}{4}$
Succoneset Shoal Light-vessel, W. $\frac{1}{8}$ N. Nearly-----	6 $\frac{3}{4}$
East Chop Light-house, N. $\frac{1}{4}$ E. -----	nearly 3
Holmes' Hole Light-house, NE. $\frac{1}{4}$ N. -----	2 $\frac{1}{2}$

If this buoy is made in thick weather, Nobska Point Light-house should bear **W.** $\frac{3}{4}$ **N.**, three miles and a half distant.

There should be placed on the southern side of this shoal another buoy to mark a projecting point which has six feet water upon it, and which at present mariners have no guide for avoiding in thick weather. At night, the rule is not to go to the northward of Nobska Point Light-house bearing **W.** by **N.** $\frac{1}{4}$ **N.**

The Hedge Fence is a long and narrow shoal similar to L'Homme Dieu, but narrower,—being in no place over three hundred yards wide. Its direction is **NW.** by **W.** $\frac{1}{2}$ **W.** and **SE.** by **E.** $\frac{1}{2}$ **E.**, its length three and a half miles, and the depth on the shoalest parts five and six feet at mean low water. It is composed mainly of hard sand and is bold-to on both sides, so that strangers should be very careful not to approach it too closely at night. The nun-buoy on its eastern end bears from

	Miles.
Cross Rip Light-vessel, W NW. -----	9 $\frac{1}{2}$
The red nun-buoy midway of the southern arm of the Horse-Shoe, W. $\frac{3}{4}$ N. Northerly-----	5 $\frac{3}{4}$
Cape Poge Light-house, N. by W. $\frac{1}{2}$ W. -----	4
Holmes' Hole Light-house, E. $\frac{1}{8}$ S. -----	a little over 4 $\frac{3}{4}$
Nobska Point Light-house, SE. by E. $\frac{3}{8}$ E. -----	7 $\frac{5}{8}$
Succoneset Shoal Light-vessel, SW. $\frac{1}{4}$ W. -----	a little over 4

From the black spar-buoy on the eastern end of L'Homme Dieu Shoal it bears **SW.** by **S.** $\frac{3}{4}$ **S.**, distant a little over two miles, which is here the width of the Middle Channel; although it gradually contracts as it continues to the westward between the two shoals, until at their western end it is only a mile and an eighth wide. The sailing-line passes nearly midway between the two, leading directly for Nobska Point Light-house.

Soundings of from five to six feet water are found at short intervals along the whole length of The Hedge Fence, with depths of from ten to sixteen feet between them. On its western end is placed a nun-buoy* of the second class, also painted red and black in horizontal stripes, and anchored in three and a half fathoms, hard sandy bottom. It bears from

	Miles.
The buoy on the eastern end, NW. by W. $\frac{1}{2}$ W. -----	3 $\frac{1}{2}$
Cape Poge Light-house, NW. $\frac{3}{4}$ N. -----	nearly 7
Holmes' Hole Light-house, NE. by E. $\frac{1}{2}$ E. -----	nearly 2
The can-buoy on the eastern end of The Middle Ground, E. by N. $\frac{1}{2}$ N. -----	2 $\frac{1}{8}$
Nobska Point Light-house, E SE. Nearly-----	a little over 4
The black buoy on the western end of L'Homme Dieu Shoal, S. by E. Southerly-----	1 $\frac{1}{8}$
The black buoy on the eastern end of L'Homme Dieu Shoal, W. $\frac{1}{8}$ S. , nearly-----	4

At night, vessels beating through the Middle Channel should not go to the southward of Nobska Point Light-house bearing **W.** by **N.** $\frac{3}{4}$ **N.**, to avoid The Hedge Fence.

A little over two miles to the westward of L'Homme Dieu and The Hedge Fence shoals all the channels through the Sound unite, and a description of the dangers from this point until to the westward of Sow and Pigs Light-vessel will be found on pages 99-101.

SAILING DIRECTIONS

FOR ENTERING AND PASSING THROUGH NANTUCKET AND VINEYARD SOUNDS.

III. *By the Middle Channel.*—Having come through the Butler's Hole Passage as far as the Handkerchief Light-vessel, the course thence is **W. $\frac{3}{4}$ S.** for eight and a quarter miles, carrying not less than six fathoms water. This course leads up with, and about three-eighths of a mile to the southward of, the red nun-buoy (No. 12) on the southern end of the Broken Ground of the Horse-Shoe. When past it Cross Rip Light-vessel will bear **W. by N. $\frac{1}{4}$ N.**, distant two miles and a quarter; which course should be steered until up with the light-vessel, which may be passed close-to on either hand, and the course is then **NW. by W. $\frac{1}{4}$ W.** for nearly nine and a half miles, carrying not less than six fathoms water. This course leads up nearly midway between the buoys on the eastern ends of L'Homme Dieu and The Hedge Fence shoals. When between these two, in ten fathoms water, with Cape Poge Light-house bearing **S. $\frac{3}{4}$ E.** and Succonesset Shoal Light-vessel bearing **NE. by E. $\frac{3}{4}$ E.**, the course is **W. by N. $\frac{1}{2}$ N.** for nearly five miles and a half, with Nobska Point Light-house directly ahead. This course leads between L'Homme Dieu Shoal and The Hedge Fence with not less than four fathoms water, and must be continued until within two miles of Nobska Point Light-house, with Holmes' Hole Light-house bearing **S. $\frac{1}{4}$ E.**, whence the course will be **W. by S. $\frac{3}{4}$ S.** until Vineyard Sound Light-vessel bears **NW. $\frac{2}{3}$ W.**, two miles distant. Here the depth will be twelve fathoms, and the course may be shaped **WNW.** for Brenton's Reef Light-vessel; **W. $\frac{3}{4}$ N.** for the entrance to Block Island Sound; or **W. by S. $\frac{3}{4}$ S.** to pass to the southward of Block Island.

Vessels from the *westward*, bound through the Sound by this channel, need only to *reverse* the above courses.

The above courses pass three-eighths of a mile to the southward of the red nun-buoy on the southern end of the southeastern Broken Ground of the Horse-Shoe; a quarter of a mile to the northward of the black spar-buoy on the northern end of Cross Rip; nearly two miles to the northward of Norton's Shoal; nearly seven-eighths of a mile to the southward of the red nun-buoy on the south side of the Horse-Shoe, near its middle; a mile and an eighth to the northward of the horizontally-striped nun-buoy on the eastern end of The Hedge Fence; seven-eighths of a mile to the southward of the black spar-buoy on the eastern end of L'Homme Dieu Shoal; about nine hundred yards to the northward of the horizontally-striped nun-buoy on the western end of The Hedge Fence; a little over half a mile to the southward of the black spar-buoy on the western end of L'Homme Dieu Shoal; a mile and a half to the northward of the can-buoy on the eastern end of The Middle Ground; three-quarters of a mile to the northward of the centre of The Middle Ground, and seven-eighths of a mile to the northward of the nun-buoy on its western end; a mile and a half to the northward of Lucas' Shoal; and from a mile and three-eighths to two miles and an eighth to the southward of Sow and Pigs Reef.

Or, having entered the Sound by the Main or Southern Entrance. the course is **W. by N. $\frac{1}{4}$ N.**, which leads up to Cross Rip Light-vessel,—the least water on the line being five and a quarter fathoms. From this light-vessel the course is **NW. by W. $\frac{1}{4}$ W.**, following the directions given above.

DANGERS

IN APPROACHING, ENTERING AND PASSING THROUGH NANTUCKET AND VINEYARD SOUNDS.

IV. *By the Main or South Channel.*—The entrance to this channel lies between Great Round Shoal on the north and McBlair's Shoal on the south, and is two miles and three-eighths wide. It is the passage commonly used by coasters of heavy draught and those who are without local pilots, on account of its width and directness as well as the absence of conflicting currents along its course. A vessel which has come from the northward along the eastern shore of Cape Cod will pass to the eastward of the Broken Part of Pollock Rip if intending to enter by the Main Channel. This shoal has been already described on pages 90 and 103; but it will be perhaps as well to repeat the description here, that the mariner may have before him in detail all of the dangers which obstruct this entrance to Nantucket Sound.

The Broken Part of Pollock Rip is composed of a number of narrow ridges of hard sand extending in a northerly and northwesterly direction, with from twelve to sixteen feet water upon them. Between it and the Main Portion of Pollock Rip there exists a channel *Broken Part of Pollock Rip.* nearly seven-eighths of a mile wide with from three to six fathoms water, which is much used by coasters who are acquainted with the shoals and the set of the currents. This has been already described on pages 90 and 103. The northern end of the Broken Part of the

Dangers---Main Channel. Rip bears **E. by S. $\frac{1}{2}$ S.** from Monomoy Point Light-house, distant four miles and a quarter, and from Pollock Rip Light-vessel **NE. $\frac{1}{2}$ N.**, distant one mile and an eighth. Its southern end bears from Monomoy Point Light-house **SE. by E. $\frac{1}{2}$ E.**, distant five miles and a half, and from the light-vessel **E. by S. $\frac{1}{4}$ S.**, distant one mile and five-eighths. This southern end is marked by an iron can-buoy of the first class (marked No. 2), painted red and placed in twenty feet water. This is the first buoy met with by vessels bound for the Main Channel after they have passed Chatham Bar. The course for the Main Entrance passes a mile and five-eighths to the eastward of it.

Next to the southward of the Broken Part of Pollock Rip, and about three-quarters of a mile distant, lies Twelve Feet Shoal, a narrow sand-spit, lying **E. and W.**, half a mile long, two hundred and fifty yards wide in its widest part, and having its shoalest water (twelve feet) at its eastern end, where is placed a nun-buoy of the second class, painted black and marked **No. 1.** This buoy bears from Pollock Rip Light-vessel **SE. $\frac{3}{8}$ E.**, distant nearly a mile and a half, and from the red can-buoy on the southeastern end of the Broken Part of Pollock Rip **SW. $\frac{1}{4}$ W.**, distant three-quarters of a mile. The course for the Main Entrance leads two miles to the eastward of this shoal, and to avoid it vessels in beating should not stand to the westward of Chatham Light-houses bearing **N. $\frac{7}{8}$ W.**

Three-eighths of a mile **S. $\frac{1}{2}$ E.** from the nun-buoy on Twelve Feet Shoal lies another detached shoal with from fourteen to sixteen feet water. This shoal is a quarter of a mile long in a **NNE.** and **SSW.** direction; and six hundred yards **SW. $\frac{5}{8}$ W.** from its southern end lies still another with ten feet on its eastern and fourteen feet on its western end. This latter shoal lies nearly

Broken Rip. **E. and W.** and is about six hundred yards long. The common name "Broken Rip" is given to both of these shoals. A black nun-buoy of the second class, marked No. 3, is placed near the centre of this shoal in twelve feet water, and the sailing-lines for this channel pass two miles and a half to the eastward of it. The shoalest part of the Rip lies an eighth of a mile **E. by S. $\frac{3}{4}$ S.** from this buoy, and has ten feet at mean low water.

At night, to avoid the Broken Rip, vessels must not stand to the westward of Chatham Light-houses bearing **N. $\frac{3}{4}$ W.**

To the southward of Broken Rip lies that extensive series of narrow sand ridges already described on page 91, and known as Great Round Shoal. Its main portion lies about **ESE.** and **WNW.**, is about two miles long, and has soundings varying from four to twelve feet upon it. But innumerable narrow ridges of hard sand extend in parallel lines (having about a **NW.** direction) along the northern side of the shoal; and others off the southern side, some of which run **E. and W.**, and others **NE.** and **SW.**, with from ten to sixteen feet water upon them. At present there is but one buoy marking Great Round Shoal, and this is placed three-eighths of a mile **SW. by W. $\frac{1}{2}$ W.** from the shoalest part, and on the northern side of the Main Channel; but there are shoal spots of sixteen feet five-eighths of a mile to the southeastward of this buoy, and one spot with thirteen feet a mile and an eighth **SE. $\frac{3}{4}$ E.** from the buoy, which should therefore receive a berth to the westward of not less than one mile and an eighth, and to the northward of not less than eight hundred yards. This shoalest part of Great Round Shoal lies close to its southern edge and has four feet at mean low water. It bears from

	Miles.
Pollock Rip Light-vessel, S. $\frac{3}{4}$ W.	4 $\frac{3}{4}$
Monomoy Point Light-house, SSE	7 $\frac{1}{2}$
Handkerchief Light-vessel, E. by S. $\frac{1}{2}$ S.	7 $\frac{1}{2}$
Nantucket Light-house, E. by N. $\frac{3}{4}$ N.	7 $\frac{1}{2}$

The buoy, which is a red spar, marked No. 2, is placed in twenty feet water three-quarters of a mile to the southward of the "four-feet spot," and the sailing-lines pass seven-eighths of a mile to the southward of it.

To pass clear of Great Round Shoal, to the southward of it, vessels should not stand to the northward of Nantucket Light-house bearing **W. $\frac{3}{4}$ S.** until to the westward of the red spar-buoy (No. 2) on the southern side of the shoal—with Pollock Rip Light-vessel bearing **N. by E.**; after which the rule is not to stand to the northward of Handkerchief Light-vessel bearing **NW. by W.**

The tide-rips over the numerous ridges composing Great Round Shoal are quite strong and run in different directions; and the bottom is so broken that, although narrow passages exist across several parts of the shoal with from fourteen to eighteen feet water in them, it is not advisable for any stranger, however light his draught, to attempt to pass through them.

McBlair's Shoal. The southern side of the Main Entrance to Nantucket Sound is obstructed by McBlair's Shoal, a series of small detached sand shoals, with from nine to eighteen feet water upon them, extending over a space two miles and a half long in an **E. and W.** direction. Its eastern extremity bears from

	Miles.
Monomoy Point Light-house, SE. by S.	12 $\frac{5}{8}$
Nantucket Light-house, E. $\frac{1}{2}$ S.	11 $\frac{1}{2}$
Sankaty Head Light-house, NE. by E. $\frac{1}{4}$ E.	10 $\frac{1}{4}$

From the red can-buoy (No. 2) on the southern end of the Broken Part of Pollock Rip it bears S. by E. $\frac{3}{8}$ E., eight miles and three-eighths, and from the red spar-buoy (No. 2) on the southern side of Great Round Shoal SE. $\frac{3}{4}$ E., distant a little over five and a half miles.

The western end of McBlair's Shoal bears from

	Miles.
Nantucket Light-house, E. $\frac{1}{2}$ S. -----	9 $\frac{1}{4}$
Handkerchief Light-vessel, SE. $\frac{1}{2}$ E. -----	11 $\frac{1}{8}$
The red spar-buoy on the southern side of Great Round Shoal, SE. $\frac{3}{8}$ S. ---	3 $\frac{3}{4}$

The shoalest part is nearly midway between the eastern and western ends, but rather nearer to the former, and soundings of nine feet are found upon it at mean low water. It bears from

	Miles.
The red can-buoy on the southern end of the Broken Part of Pollock Rip, S. $\frac{3}{4}$ E. -----	8 $\frac{3}{8}$
Red spar-buoy on the southern side of Great Round Shoal, SE., nearly	5
Handkerchief Light-vessel, SE. $\frac{3}{4}$ E. -----	12 $\frac{1}{2}$
Nantucket Light-house, E. $\frac{5}{8}$ S. -----	10 $\frac{1}{2}$

To avoid McBlair's shoal, if approaching it from the eastward, the rule is not to go to the westward of Pollock Rip Light-vessel bearing NW. by N. $\frac{1}{2}$ N. until Nantucket Light-house bears W. $\frac{1}{4}$ N.; which course, if steered, will lead through the Main Channel along the northern side of the shoal with not less than five and a half fathoms water. This bearing of Nantucket Light-house is, therefore, useful also as a guide to vessels beating through the Main Channel, which should go about, when standing to the southward, as soon as this bearing comes on. Strangers should not pass to the southward of this shoal, as, although there is deep water between it and The Rose and Crown, (the northernmost of the great Nantucket Shoals,) yet the bottom is broken; the currents strong and running at right angles to the passage; and there is a dangerous *twelve feet shoal* a little over two miles S SE. from the "nine-foot spot" on McBlair's Shoal. This shoal is not buoyed, but has a strong rip over it,—the current running about NE. by N. and SW. by S. with a velocity of from a mile and a half to two miles an hour. Nantucket Light-house bears from it W. by N. $\frac{1}{2}$ N., eleven miles and five-eighths distant.

Great Point Rip, the next danger met with, lies on the southern side of the Main Channel, extending from Great Point (the northeastern point of Nantucket Island) in an E. by N. $\frac{1}{4}$ N. direction for three miles and an eighth. It is composed, as indicated by the latest surveys, of a great number of small sand lumps with from one to six feet water upon them, and separated *Great Point Rip*. from each other by narrow slues with from eight to twelve feet water. The bottom, throughout the length of the shoal, is composed of hard grey sand, mixed at the outer end with black specks and gravel. A black spar-buoy, marked No. 1, is placed on the northern side of the eastern end of the shoal in eighteen feet water; and bears from

	Miles.
Nantucket Light-house, NE. by E. $\frac{3}{4}$ E. -----	3
Sankaty Head Light-house, N. $\frac{1}{4}$ E. ----- a little over	8
Red spar-buoy on the southern side of Great Round Shoal, W. by S. ---	4 $\frac{1}{8}$
Cross Rip Light-vessel, E. by S. $\frac{3}{8}$ S. -----	13 $\frac{3}{8}$

To avoid Great Point Rip, in beating through the Main Channel at night, vessels should not stand into less than six fathoms on the southerly tack. When clear of the shoal to the westward, Nantucket Light-house will bear SE. by S. $\frac{3}{4}$ S., or Handkerchief Light-vessel N. by E. Easterly.

The channel between Great Point Rip and Great Round Shoal is in no place less than three miles wide, and between the Rip and Handkerchief Light-vessel it is over five miles wide, and entirely unobstructed. To the westward of the Rip there are no dangers met with for nearly six miles, when it becomes necessary to look out, on the southern side of the channel, for Tuckernuck Shoal, a sand bar of very irregular shape, which extends first in a W. $\frac{1}{4}$ S. direction *Tuckernuck Shoal*. for nearly five miles, and then about S. by E. for two miles, nearly joining the extensive sand bar at making off from Tuckernuck and Muskeget islands, called *Tuckernuck Bank*. As

here is no safe passage between the shoal and the bank, these extensive sand bars may be considered as dangerous; and vessels bound either to the eastward or westward should never attempt to pass to the southward of Nantucket Light-house bearing E. by S. $\frac{3}{4}$ S., or Cape Poge Light-house bearing W. by N. $\frac{1}{4}$ N.

The soundings on Tuckernuck Shoal are very irregular,—six feet being found at its southwestern end, and soundings of from four to six feet extending from this point in about a N NE. direction for about a mile and a half along a very narrow ridge, while at its eastern end there is not less than ten feet, and near the middle of the northern part of the shoal from six to eight feet; and thence soundings varying all the way from eight to fifteen feet continue to its western end. To mark the southern limits of the Main Channel there is placed on the eastern end of this shoal a black can-buoy* of the third class, marked No. 7, which bears from

	Miles.
The black spar-buoy on the eastern end of Great Point Rip, W. $\frac{3}{4}$ N.	9
Handkerchief Light-vessel, SW. by W. Westerly	7 $\frac{1}{2}$
Nantucket Light-house, W. by N. $\frac{3}{8}$ N.	6 $\frac{1}{2}$
Cross Rip Light-vessel, SE. $\frac{1}{4}$ E.	5 $\frac{1}{2}$

From this buoy to the red buoy on the southern end of the Broken Ground of the Horse-Shoe the bearing is NW. by N. $\frac{3}{4}$ N. and the distance three and three-quarter miles.

On the northern side of the Main Channel, when within about three miles of Cross Rip Light-vessel, a red nun-buoy,* marked No. 12, will be seen. This is on the Broken Ground, *Broken Ground of the Horse-Shoe* which lies about a mile to the eastward of the southeastern end of Horse-Shoe Shoal, and extends from the buoy nearly NNE. for a mile and an eighth, with from thirteen to sixteen feet water upon it. Cross Rip Light-vessel bears from this buoy W. $\frac{1}{2}$ N., distant two and three-eighths miles. A *slue channel* with from four to eight fathoms water, and in no place less than three-quarters of a mile wide, separates this Broken Ground from Horse-Shoe Shoal proper. Its general direction is N. and S., and it may be crossed with not less than four fathoms by bringing Bishop and Clerk's Light-house to bear N. by E. and steering S. by W. until Cross Rip Light-vessel bears W. by N. $\frac{1}{2}$ N.

Horse-Shoe Shoal is composed entirely of hard sand and is dry in several places at mean low water. It receives its name from its shape, which is somewhat that of a horse-shoe; but its southern arm, which forms the northern boundary of this channel, is much longer than the northern one. The depth along this southern arm varies from one to sixteen feet at mean low water and there are several bare spots. Narrow slues, through which from thirteen feet to five fathoms may be carried, traverse the shoal at intervals; but these passages are not safe for strangers.

The eastern end of the southern arm begins one mile E. $\frac{3}{4}$ N. from Cross Rip Light-vessel and about one and three-eighths miles to the westward of the red nun-buoy on the Broken Ground. Thence the course of the shoal is NW. by W. $\frac{1}{2}$ W. for two miles, and then NW. by W. *Nearly*, for two and a half miles, where is placed a red nun-buoy* (No. 14) marking the northern limits of the Main Channel. From this buoy the shoal runs NW. by N. for a little over two miles and a quarter, and then NNE. Easterly, to the northwestern extremity or "toe" of the shoe,—the entire length from the buoy on the Broken Ground to the "toe" being eight and three-quarter miles. Vessels should not approach the southern side of this shoal nearer than to bring Cross Rip Light-vessel to bear SE. $\frac{1}{4}$ E. until up with the red nun-buoy (No. 14) mentioned above; or until Cape Poge Light-house bears SW. by W. When past the buoy they should not stand to the northward of Succonesset Shoal Light-vessel bearing NW. by N. $\frac{1}{4}$ N. Following these directions, they will in no case find less than three and a half fathoms. (See also pages 95-96.)

On the southern side of the channel, two miles and five-eighths W. $\frac{1}{8}$ S. from the red buoy No. 12 on the Broken Ground of the Horse-Shoe, and three-eighths of a mile SW. $\frac{1}{4}$ W. from Cross Rip Light-vessel, will be seen a black spar-buoy, marked No. 9. This is on the northern end of *Cross Rip*. Cross Rip, the northernmost of the numerous detached shoals lying on the southern side of the Main Channel, between the western end of Nantucket and the eastern end of Chappaquiddick Island. It has eleven feet at mean low water, lies N. by W. and S. by E., and is three-quarters of a mile long. The buoy is placed in three fathoms off its northern end, and bears from Cape Poge Light-house E., seven and a quarter miles; from Holmes' Hole Light-house E. by S. $\frac{3}{4}$ S., nearly fourteen miles, (and this last bearing as a course may be steered with safety;) and from Nantucket Light-house NW. by W. $\frac{1}{2}$ W., eleven and five-eighths miles distant.

Cross Rip Light-vessel is anchored in eight fathoms, nearly midway between Horse-Shoe Shoal on the northern and Cross Rip on the southern side of the channel. It is a schooner-rigged vessel, painted black with a white streak, and has the words "*Cross Rip*" in white letters on each side. From the mast-head, thirty-nine feet above the sea, is shown a fixed white light, visible twelve miles. A bell is rung in foggy weather. The approximate geographical position of this light-vessel is

Latitude ----- 41° 26' 57'' N.
Longitude ----- 70° 17' 30'' W.,

and it bears from

	Miles.
Cape Poge Light-house, E. $\frac{1}{4}$ N.	7 $\frac{1}{2}$
Holmes' Hole Light-house, E. by S. $\frac{5}{8}$ S.	a little over 14
Nobska Point Light-house, SE. by E. $\frac{1}{8}$ E.	17
Succonesset Shoal Light-vessel, SE. $\frac{1}{3}$ S.	8 $\frac{1}{4}$
Bishop and Clerk's Light-house, SW. by S. $\frac{1}{4}$ S.	nearly 7 $\frac{1}{2}$
Handkerchief Shoal Light-vessel, W. $\frac{1}{4}$ S.	10 $\frac{1}{2}$
The red nun-buoy on the Broken Ground of the Horse-Shoe, W. $\frac{1}{2}$ N.	2 $\frac{3}{8}$
Nantucket Light-house, NW. by W. $\frac{1}{8}$ W.	11 $\frac{1}{2}$

At this point the Middle and South channels separate,—the former passing to the northwestward to go between L'Homme Dieu Shoal and The Hedge Fence, and the latter continuing to the westward towards Holmes' Hole Light-house—passing to the southward of The Hedge Fence.

It is dangerous for strangers to go to the southward of Cross Rip,—the whole space between the Rip and Tuckernuck and Muskeget islands being full of dangerous shoals. Of these, the first to the southward of Cross Rip is called Edwards' Shoal, which lies three-quarters of a mile S. by W. $\frac{3}{4}$ W. from the southern end of Cross Rip, has ten feet at mean low water, and is not buoyed.

It is not dangerous to vessels using the Main Channel unless they are standing to the southwestward on a wind while to the eastward of Cross Rip. The "ten-feet spot" on this shoal is on its eastern side, near the middle, and bears from Cross Rip Light-vessel S. by W., a little over two miles distant, and from the red buoy on the Broken Ground of the Horse-Shoe SW. by W., three and a half miles distant. Between this shoal and Cross Rip there is a channel nearly three-quarters of a mile wide, with from four to eleven fathoms; but strangers should not attempt it.

A mile and an eighth NW. $\frac{1}{8}$ N. from the "ten-feet spot" on Edwards' Shoal, and a mile and five-eighths SW. $\frac{3}{8}$ W. from Cross Rip Light-vessel, lies a detached shoal, between five and six hundred yards long, with fourteen feet water upon it and from three to six fathoms on all sides of it, called Fourteen Feet Shoal. It extends N. by W. and S. by E. and is not buoyed; but it is not in the way of vessels using the Main Channel unless they are standing to the southward on a wind. To avoid it, they should go about as soon as Cross Rip Light-vessel bears E. by N.

The channel between Fourteen Feet Shoal and Cross Rip is a mile wide, with from four to seven fathoms; that between it and Edwards' Shoal is three-quarters of a mile wide, with from four to seven fathoms; and that between it and Norton's Shoal to the westward is five-eighths of a mile wide, with from three to five fathoms. These passages, however, although used by those who are local pilots, are not safe for strangers.

Next to the westward of Fourteen Feet Shoal lies Norton's Shoal, also on the southern side of the channel. This is a sand shoal with ten feet water, extending W. by N. and E. by S. and one mile and three-quarters long. It is marked by a black nun-buoy* of the second class (No. 11), placed on its northern side about midway of its length, in four fathoms water. This buoy bears from Cross Rip Light-vessel W. by S. $\frac{1}{4}$ S., nearly three miles, and from Cape Poge Light-house E. $\frac{3}{4}$ S., four and five-eighths miles distant. From this buoy the black buoy (No. 13) on the northwestern end of Hawes' Shoal bears W. $\frac{3}{4}$ N., three miles, and the black buoy (No. 15) off Cape Poge W. by N. $\frac{1}{4}$ N., a little over four and a quarter miles distant. Norton's Shoal is not in the way of vessels passing through the Main Channel unless they are standing to the southward on a wind. To avoid it, they should go about when Cross Rip Light-vessel bears E. $\frac{1}{4}$ N. or Cape Poge Light-house W. $\frac{1}{4}$ S.

Next to the westward of Norton's Shoal, and almost joining it, lies Hawes' Shoal, a very extensive piece of shoal ground of triangular shape, which extends from E. to W. for two miles and five-eighths and from N. to S. two and three-quarter miles. Over this large area soundings varying from four to sixteen feet are found; but the most dangerous portions of the shoal are on the southeastern and western sides and at its northwestern end. On its southeastern side, about midway between the northeastern and southwestern ends, are found soundings of from four to six feet, covering a space over a mile long in an ENE. and WSW. direction, with Cape Poge Light-house bearing between NW. $\frac{1}{4}$ N. and NW. by W. $\frac{3}{4}$ W.; but this part of the shoal is not in the way of vessels using the Main Channel. On the northwestern end there is placed, in three fathoms water, a black spar-buoy (No. 13), which bears from

	Miles.
Cape Poge Light-house, E. $\frac{1}{4}$ N.-----	1 $\frac{3}{8}$
The black buoy off Cape Poge, ESE. Southerly-----	1 $\frac{3}{8}$
Succoneset Shoal Light-vessel, S. $\frac{1}{8}$ W.-----	nearly 6 $\frac{1}{2}$
The red buoy on the southwestern side of the Horse-Shoe, SW. Westerly-----	4
Cross Rip Light-vessel, W. $\frac{1}{8}$ S.-----	5 $\frac{1}{4}$
The black buoy on Norton's Shoal, W. $\frac{3}{4}$ N.-----	nearly 3

There is also a red spar-buoy (No. 4) placed on the southwestern end of Hawes' Shoal, two miles and five-eighths to the southward of the northwestern buoy and the same distance S. by E. $\frac{1}{8}$ E. from Cape Poge Light-house. It is intended to mark the Muskeget Channel, and is not seen by vessels passing through the Main Channel.

In beating, to avoid Hawes' Shoal, vessels should not stand to the southward of Cape Poge Light-house bearing W. $\frac{1}{4}$ S., or Cross Rip Light-vessel E.

On the western side of Hawes' Shoal, between it and Cape Poge, is the northern entrance to Muskeget Channel; and on the western side of this entrance lie Cape Poge Flats, which make off to the northward from Cape Poge for five-eighths of a mile with from ten to sixteen feet water. On the northern edge of these flats is placed a black spar-buoy, marked No. 15, which bears from

	Miles.
Cape Poge Light-house, NE. by N. $\frac{1}{8}$ N.	$3\frac{1}{8}$
The black buoy on the northwestern end of Hawes' Shoal, W NW.	1
The black buoy on the northern side of Norton's Shoal, W. by N. $\frac{1}{8}$ N.	4
Cross Rip Light-vessel, W. $\frac{1}{4}$ N.	$7\frac{1}{8}$

From this buoy

	Miles.
The black buoy (No. 17) on the Outer Flats of Edgartown bears W. by N. ...	$2\frac{1}{8}$
The black can-buoy (No. 19) on the eastern end of Squash Meadow NW. ...	$3\frac{1}{8}$
$\frac{3}{4}$ W. Northerly	$3\frac{1}{8}$
The nun-buoy on the eastern end of The Hedge Fence NW. by N. ...	a little over $3\frac{1}{2}$
$\frac{3}{4}$ N.	

Cape Poge Flats are not in the way of vessels using the Main Channel unless they are standing to the southward on a wind; in which case they should go about as soon as Cross Rip Light-vessel bears E. $\frac{3}{4}$ S., as there is a *small shoal, with seventeen and a half feet upon it*, five-eighths of a mile NE. by E. $\frac{1}{4}$ E. from the black buoy (No. 15) on the northern end of the flats.

Outer Flats is the name given to the northernmost portion of the extensive ledges and shoals which form the western side of Edgartown Harbor. Detached rocks, some of which are bare at low water, are scattered all over this shoal ground, and several of these are buoyed. There is an *eight feet spot* on

Outer Flats. Outer Flats close to their northern end, with soundings of twelve and fifteen feet, hard sandy bottom, all around it. A little to the northeastward of this spot is placed a black can-buoy* of the second class, in three fathoms water. It is marked No. 17, as being one of the regular guides for Vineyard Sound; but it also marks the western limits of the channel into Edgartown Harbor. It bears from Cross Rip Light-vessel W. $\frac{1}{2}$ N., nine miles and an eighth; from the black buoy on Cape Poge Flats W. by N., two miles and a half; and from Succoneset Shoal Light-vessel SW. by S. Southerly, six miles and a half distant. From this buoy the black can-buoy on the eastern end of Squash Meadow bears N. by W. $\frac{1}{4}$ W., distant one mile and a half, and the black spar (No. 23) off East Chop NW. $\frac{3}{4}$ N., three miles and seven-eighths distant.

As before remarked, the Main Channel passes to the southward of The Hedge Fence,—the course being W. by N. $\frac{3}{4}$ N. On this course the channel is clear until Succoneset Shoal Light-vessel bears NE. by N., or Cape Poge Light-house S. by E., when it becomes necessary to keep a look-out for the buoys on the eastern ends of The Hedge Fence and of Squash Meadow Shoal. The former will be the first seen, bearing nearly N NW. and about a mile distant.

The Hedge Fence is a long and narrow shoal, in no place over three hundred yards wide. Its direction is NW. by W. $\frac{1}{2}$ W. and SE. by E. $\frac{1}{2}$ E., its length three and a half miles, and the depth on the shoalest parts five and six feet at mean low water. It is composed mainly of hard sand and is bold-to on both sides; so that strangers should be very careful not to approach it too closely at night. On its eastern end there is placed a nun-buoy* of the third class, painted red and black in horizontal stripes, and bearing as follows:

From

	Miles.
Cross Rip Light-vessel, W NW.	$9\frac{1}{2}$
The red nun-buoy midway of the southern arm of the Horse-Shoe, W. $\frac{3}{4}$ N. Northerly	$5\frac{1}{4}$
Cape Poge Light-house, N. by W. $\frac{3}{8}$ W.	4
Holmes' Hole Light-house, E. $\frac{1}{8}$ S.	a little over $4\frac{1}{4}$
Nobska Point Light-house, SE. by E. $\frac{3}{4}$ E.	$7\frac{3}{8}$
Succoneset Shoal Light-vessel, SW. $\frac{1}{4}$ W.	a little over 4
The black can-buoy on the eastern end of Squash Meadow, NE. by N.	$1\frac{1}{2}$

Soundings of from five to six feet water are found at short intervals along the whole length of The Hedge Fence, with depths of from ten to sixteen feet between them. On its western end is placed a nun-buoy* of the second class, also painted red and black in horizontal stripes, and anchored in three and a half fathoms, hard sandy bottom. It bears from

	Miles.
The buoy on the eastern end, NW. by W. $\frac{1}{2}$ W.	$3\frac{1}{2}$
The black can-buoy on the eastern end of Squash Meadow, NW. by N.	$3\frac{3}{4}$
Cape Poge Light-house, NW. $\frac{3}{4}$ N.	nearly 7
The black nun-buoy on the western end of Squash Meadow, N NW.	$2\frac{3}{8}$
Holmes' Hole Light-house, NE. by E. $\frac{1}{2}$ E.	nearly 2

From this buoy the can-buoy on the eastern end of The Middle Ground bears W. by S. $\frac{1}{4}$ S., two and one-eighth miles, and Nobska Point Light-house W SW. Nearly, a little over four miles distant.

At night, vessels beating through the Main Channel should not stand farther to the northward than to bring Nobska Point Light-house to bear NW. by W. $\frac{1}{2}$ W., by which means they will avoid The Hedge Fence and will not have less than six fathoms.

Squash Meadow Shoal lies on the southern side of the Main Channel and has ten feet at low water. The main body of the shoal runs NW. by W. and SE. by E. and is a little over three-quarters of a mile long; but there are detached shoals off its eastern and western ends, which increase the whole length to a mile and a quarter. Its average width is about three hundred *Squash Meadow* yards; the bottom is hard sand; and the shoal is bold-to on both sides,—there being *Shoal.* equally good channels to the northward and southward of it. The detached shoal off the eastern end has sixteen feet at mean low water, and is marked by a black can-buoy* of the second class (No 19), placed in three and a half fathoms on its eastern edge. This buoy bears from

	Miles.
The nun-buoy on the eastern end of The Hedge Fence, SW. by S.-----	1 $\frac{1}{2}$
Succonesset Shoal Light-vessel, SW.-----	5 $\frac{3}{4}$
The red nun-buoy midway of the southern arm of the Horse-Shoe, W. $\frac{1}{4}$ S.---	6
Cross Rip Light-vessel, W. by N. $\frac{1}{8}$ N.-----	9 $\frac{3}{4}$
The black buoy on the north side of Norton's Shoal, W NW.-----	7 $\frac{1}{4}$
The black buoy on the northern end of Cape Poge Flats, NW. $\frac{3}{4}$ W., a little over	3
The black buoy on the northern end of Outer Flats, N. by W. $\frac{1}{4}$ W.---	1 $\frac{1}{2}$

From this buoy

	Miles.
East Chop bears NW. by W. $\frac{1}{2}$ W. Nearly-----	2 $\frac{3}{4}$
Holmes' Hole Light-house NW. by W. $\frac{1}{4}$ W.-----	4 $\frac{3}{4}$
Nobska Point Light-house NW. $\frac{1}{2}$ W.-----	7 $\frac{1}{4}$
The black buoy (No. 21) on the western end of the shoal NW. by W.---	1 $\frac{1}{4}$

The detached shoal off the western end of the Squash Meadow has eighteen feet at mean low water, and is marked by a black nun-buoy* of the second class (No. 21), and placed in four fathoms water a little to the westward of it. This buoy bears from

	Miles.
The nun-buoy on the western end of The Hedge Fence, S SE.-----	2 $\frac{3}{4}$
The nun-buoy on the eastern end of The Hedge Fence, W. by S. $\frac{3}{4}$ S.---	2 $\frac{1}{8}$
Cross Rip Light-vessel, W. by N. $\frac{1}{3}$ N.-----nearly	11
The black buoy on Cape Poge Flats, NW. $\frac{3}{4}$ W. Westerly-----	4 $\frac{3}{4}$
Cape Poge Light-house, NW. Northerly-----	4 $\frac{3}{4}$
The black buoy on the north'n end of Outer Flats, NW. by N., a little over	2 $\frac{1}{4}$

From this buoy

	Miles.
East Chop bears NW. by W. $\frac{3}{4}$ W.-----	1 $\frac{3}{4}$
Holmes' Hole Light-house NW. by W. $\frac{1}{3}$ W.-----	3 $\frac{1}{4}$
The black buoy off East Chop Flats NW. $\frac{1}{3}$ W.-----	1 $\frac{3}{4}$
Nobska Point Light-house NW. $\frac{3}{8}$ W.-----	6 $\frac{1}{4}$

In beating, vessels should go about on the southerly tack as soon as Nobska Point Light-house bears NW. $\frac{3}{4}$ W. or Holmes' Hole Light-house W NW.

When past Squash Meadow Shoal and approaching East Chop, a black spar-buoy will be seen to the northeastward of that point. This is on East Chop Flats, which make off from the point for a quarter of a mile in a NE. by E. direction. The buoy is marked No. 23, and is placed in three fathoms close to the edge of the shoal. It bears from the black nun-buoy on *East Chop Flats.* the western end of Squash Meadow NW. $\frac{1}{2}$ W., one mile and three-eighths; from Holmes' Hole Light-house SE. by E. $\frac{3}{4}$ E., a mile and three-quarters; and from the nun-buoy on the western end of The Hedge Fence S., a mile and five-eighths distant. Nobska Point Light-house bears from this buoy NW. $\frac{1}{4}$ W., nearly five miles distant.

The buoy on East Chop Flats is also a guide to Vineyard Haven, formerly called Holmes' Hole. About three miles and a half to the westward of it all the channels through the Sounds unite, and a description of the dangers from this point until to the westward of Vineyard Sound Light-vessel will be found on pages 99-101.

SAILING DIRECTIONS

FOR APPROACHING, ENTERING AND PASSING THROUGH NANTUCKET AND VINEYARD SOUNDS.

IV. *By the Main or South Channel.*—Vessels from Boston wishing to enter Nantucket Sound by the South or Main Channel continue the S. $\frac{1}{4}$ W. course from off Nauset Beacons, (see page 101,)

Sailing Directions--Main Channel.—passing to the eastward of the shoals off Monomoy, and carrying not less than eight fathoms water, until Nantucket Light-house bears **W. $\frac{1}{8}$ S.**, distant ten miles and a quarter, when the depth will be eleven fathoms and the course **W. by N. $\frac{1}{4}$ N.** for Cross

Rip Light-vessel, distant twenty-one miles. On this course there will not be less than five and a quarter fathoms. When up with Cross Rip Light-vessel the course is **W. by N. $\frac{3}{8}$ N.**, towards Holmes' Hole Light-house, for a little over ten miles, or until Cape Poge Light-house bears **SE. by S.** and Nobska Point Light-house **NW. by W.**, when the latter course should be steered for Nobska Point Light-house until within a mile and a half of it, with Holmes' Hole Light-house bearing **SE. by S. $\frac{1}{8}$ S.**, with eleven fathoms water, sticky bottom; whence the course is **W. by S. $\frac{5}{8}$ S.** through-out Vineyard Sound, carrying not less than nine fathoms, until the light-vessel off the Sow and Pigs bears **NW. $\frac{3}{4}$ W.**, two miles distant. Here the depth will be twelve fathoms, and the course may be shaped **W NW.** for Brenton's Reef Light-vessel; **W. $\frac{5}{8}$ N.** for the entrance to Block Island Sound; or **W. by S. $\frac{3}{4}$ S.** to pass outside of Block Island.

Vessels from the *westward*, bound through the Sound by this channel, need only to *reverse* the above courses.

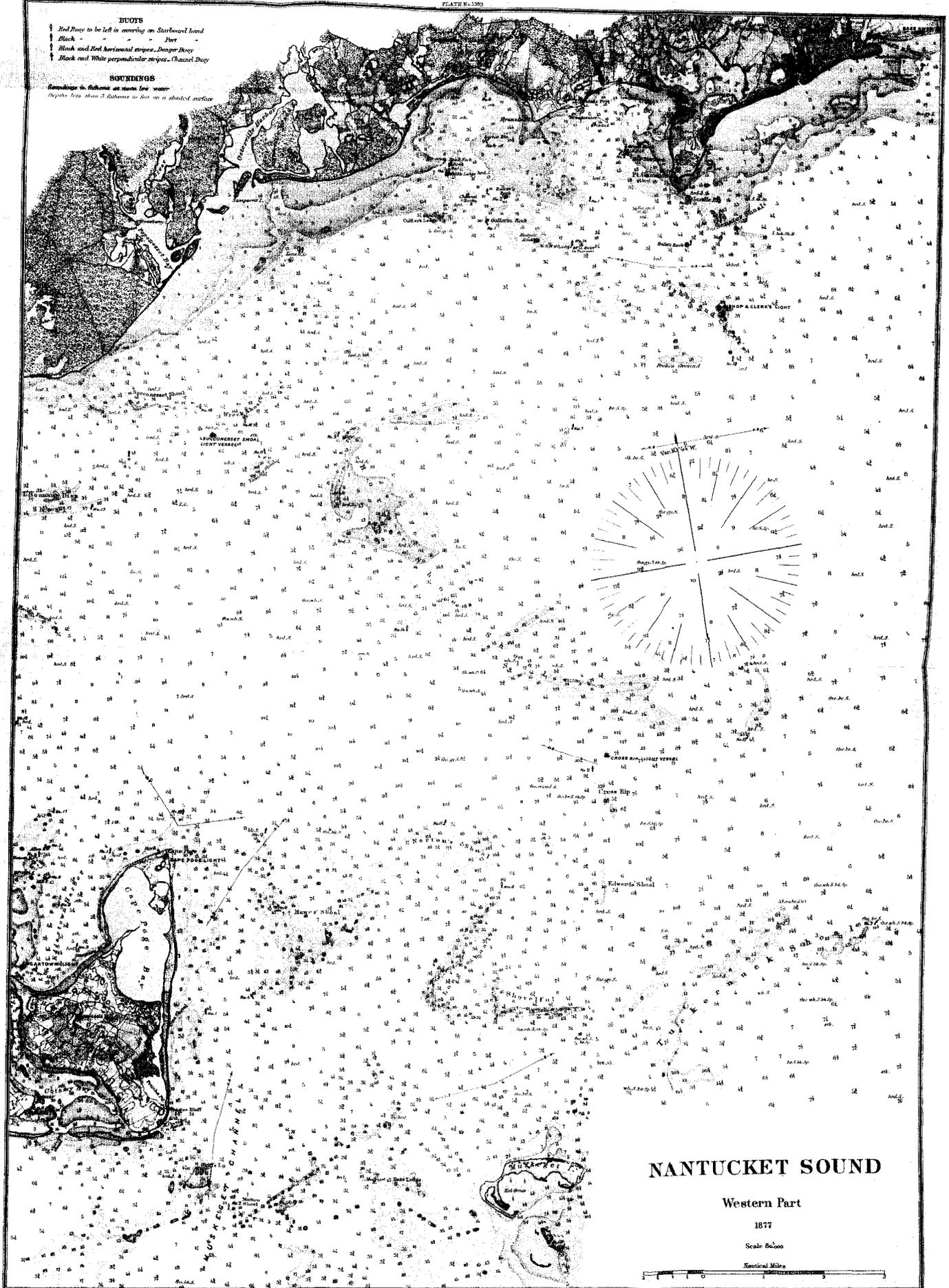
The above courses pass two miles and five-eighths to the eastward of the large nun-buoy on the detached shoal between the Main Portion of Pollock Rip and the Broken Part; one mile and a half to the eastward of the red can-buoy on the southeastern end of the Broken Part of Pollock Rip; one mile and seven-eighths to the eastward of the horizontally-striped nun-buoy off the eastern end of Twelve Feet Shoal; two miles and three-quarters to the eastward of the black nun-buoy on Broken Rip; two miles and five-eighths to the eastward of Great Round Shoal; one mile and a quarter to the northward of McBlair's Shoal; one mile and an eighth to the southward of the red spar-buoy on the southern side of Great Round Shoal; the same distance to the northward of the black spar-buoy on the northeastern end of Great Point Rip; three miles and an eighth to the southward of Handkerchief Light-vessel; two miles and three-eighths to the northward of the black nun-buoy on the eastern end of Tuckernuck Shoal; half a mile to the southward of the red nun-buoy on the Broken Ground of the Horse-Shoe; three-eighths of a mile to the southward of the southeastern end of the Horse-Shoe; a quarter of a mile to the northward of the black spar-buoy on the northern end of Cross Rip; a mile and a half to the southward of the red nun-buoy midway of the southern arm of the Horse-Shoe; a mile and three-eighths to the northward of Fourteen Feet Shoal; a mile and a half to the northward of the black nun-buoy on Norton's Shoal; two miles to the northward of the black spar-buoy on the northwestern end of Hawes' Shoal; a mile and seven-eighths to the northward of the black spar-buoy on Cape Poge Flats; two miles and an eighth to the northward of the black spar-buoy on the Outer Flats off Edgartown; five-eighths of a mile to the southward of the nun-buoy on the eastern end of The Hedge Fence; seven-eighths of a mile to the northward of the black can-buoy on the eastern end of Squash Meadow Shoal; three-quarters of a mile to the northward of the black nun-buoy on the western end of Squash Meadow Shoal; five-eighths of a mile to the northward of the black spar-buoy on East Chop Flats; the same distance to the southward of the nun-buoy on the western end of The Hedge Fence; seven-eighths of a mile to the northward of the horizontally-striped can-buoy on the eastern end of The Middle Ground; three-quarters of a mile to the northward of the horizontally-striped nun-buoy on the western end of The Middle Ground; a mile and a half to the northward of Lucas' Shoal; two miles and three-quarters to the northward of the black nun-buoy on The Devil's Bridge; and a mile and seven-eighths to the southward of Sow and Pigs Reef.

On the above courses, to enter Hyannis Roads.—When between Handkerchief Light-vessel and Nantucket Light-house, (the former bearing **N. $\frac{1}{4}$ E.**, three and a quarter miles distant, and the latter **S. $\frac{1}{4}$ W.**, two miles and seven-eighths distant,) the depth will be seven fathoms and the course **NW. by N.**, and Bishop and Clerk's Light-house will soon appear a little to the westward of the course. The soundings on this line vary from five to seven fathoms, and it should be continued until Bishop and Clerk's Light-house bears **W. by N. $\frac{1}{4}$ N.**, distant seven-eighths of a mile. The depth at this point is five and a half fathoms, and the course thence is **NW. $\frac{1}{4}$ W.**, which leads, with not less than three and a quarter fathoms, between Senator and Bishop and Clerk's shoals, and about one hundred and fifty yards to the southwestward of Hallet's Rock. This course should be continued until Hyannis

- BUOYS**
- Red Disc to be left in covering on Starboard hand
 - Black - Port
 - Black and Red horizontal stripes - Danger Buoy
 - Black and White perpendicular stripes - Channel Buoy

SOUNDINGS

Soundings in fathoms on even feet water
 Depths less than 3 fathoms in feet on a shaded surface



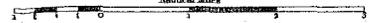
NANTUCKET SOUND

Western Part

1877

Scale 6:000

Nautical Miles



Light-house bears **N. by E. $\frac{1}{4}$ E.**, two miles distant, when the buoy on West-Southwest Ledge will be nearly abeam, bearing **SW. $\frac{1}{2}$ W.**, distant seven-eighths of a mile. The course is now for Hyannis Light-house, following the directions given for the Roadstead.

Passing through the South Channel, to enter Edgartown Harbor.—On the course **W. by N. $\frac{5}{8}$ N.** from Cross Rip Light-vessel, when Cape Poge Light-house bears **SW. $\frac{1}{4}$ S.**, two miles and three-quarters distant, the depth will be ten fathoms, and the course **SW. by W.** to the entrance to the harbor, or until Cape Poge Light-house bears **SE. by E. $\frac{1}{4}$ E.**, one mile and an eighth distant; from which point the directions given for the harbor must be followed. Or, from Cross Rip Light-vessel the course is **W. $\frac{3}{4}$ N.**, carrying not less than four and three-quarter fathoms, until Cape Poge Light-house bears **S. by W. $\frac{1}{4}$ W.**, a mile and a quarter distant, when the depth will be six and three-quarter fathoms and the course **SW. by W.**, as before.

Passing through the South Channel, to enter Vineyard Haven.—The course **W. by N. $\frac{5}{8}$ N.** towards Holmes' Hole Light-house may be continued until within a mile and a quarter of the light, where the depth will be eight fathoms, and the course **SW. $\frac{1}{2}$ W.** will lead straight to the head of the harbor with not less than three and a half fathoms. Or, on the **NW. by W.** course for Nobska Point Light-house, when Holmes' Hole bears **W. Southerly**, distant nearly a mile and three-quarters, **SW. $\frac{1}{2}$ W.** should be steered, as before.

To enter Wood's Hole Harbor, having come through the South Channel.—The **NW. by W.** course for Nobska Point Light-house should be continued until within a mile and a half of it, when the depth will be eleven fathoms, and **NW. by W. $\frac{7}{8}$ W.** will lead to the entrance to Little Harbor, or **W. $\frac{3}{4}$ N.** to a position for entering by the Main Channel; after which the directions for the harbor must be followed.

Passing through Vineyard Sound from the Eastward, to enter Tarpaulin Cove.—On the **W. by S. $\frac{3}{4}$ S.** course through Vineyard Sound, when Nobska Point Light-house bears **NE. $\frac{1}{2}$ E.**, Tarpaulin Cove Light-house will bear **W. $\frac{1}{8}$ N.**, two miles and a half distant. The depth will be eleven fathoms, and the course **W. by N.** into the harbor.

Having come through Vineyard Sound from the Eastward, to pass through Quick's Hole into Buzzard's Bay towards New Bedford.—On the course **W. by S. $\frac{5}{8}$ S.** through Vineyard Sound, when Gay Head Light-house bears **S. by W. $\frac{3}{4}$ W.** Quick's Hole will be open, and **NW. $\frac{1}{2}$ N.** will lead safely in, with not less than five and three-quarter fathoms, until abreast of the red nun-buoy (No. 2) on the ledge off the western end of Pasque Island, known as *Quick's Hole Ledge*. When abreast of this buoy, in seven fathoms, the course is **N. $\frac{1}{2}$ E.** for about a mile until up with the nun-buoy (red and black) on Lone Rock; when a **N.** course will lead across Buzzard's Bay to the entrance to New Bedford.

SAILING DIRECTIONS

FOR VESSELS BOUND FROM SALEM THROUGH NANTUCKET AND VINEYARD SOUNDS.

1. **Having come through the Western or Marblehead Channel.**—With Baker's Island Light-houses bearing **NE. $\frac{1}{4}$ N.** and Marblehead Light-house **NW. by N. $\frac{3}{4}$ N.**, the depth will be seven fathoms, and the course to clear Cape Cod will be **SE. $\frac{1}{4}$ S.** until the northern extremity of Race Point bears **W SW. Southerly**, and Highland Light-house **SE. by S. $\frac{3}{4}$ S.**, six and a quarter miles distant. At this point the depth will be between twenty-three and twenty-four fathoms and the course **SE. $\frac{1}{2}$ S.**, until Highland Light-house bears **SW. by W. $\frac{1}{2}$ W.**, one mile and a half distant, when the depth will be fourteen fathoms, and **S. by E. $\frac{1}{4}$ E.** will lead along the beach at a distance of not less than seven-eighths of a mile and with a depth of not less than six and a half fathoms. This course will, however, be unsuitable for thick or easterly weather, as it leads too close to Peaked Hill Bar and the other shoals on the eastern face of the cape. In thick weather vessels should not go inside of twenty fathoms.

The **S. by E. $\frac{3}{4}$ E.** course should be continued until Nauset Beacons bear **SW. by W. $\frac{3}{4}$ W.** and are nearly abeam, when **S. $\frac{1}{4}$ W.** will lead, with not less than nine fathoms, to abreast of the northern entrance to Chatham. At this point Chatham Light-houses will bear **SW. by W. $\frac{1}{2}$ W.**, and if bound through the slue by the western channel, the course will be **SW. by S. $\frac{3}{4}$ S.**, crossing the Broken Part of Pollock Rip in not less than nineteen feet; after which the directions for the passage through Butler's Hole should be followed. (See pages 101-102.)

Or, intending to cross the slue by the Eastern Channel, the **S. $\frac{1}{4}$ W.** course should be continued until the southernmost of the Chatham Light-houses bears **W. by N. $\frac{1}{8}$ N.**, when the depth will be ten fathoms, and the course **SW. by S. $\frac{3}{8}$ S.** will cross the slue in not less than three and a quarter fathoms and lead directly up to Pollock Rip Light-vessel; after which the directions for Butler's Hole passage should be followed. (See pages 101-102.)

Or, if bound in by the Southern or Main Entrance, vessels should continue the **S. $\frac{1}{4}$ W.** course, which leads to the eastward of the shoals, until Pollock Rip Light-vessel bears **NNW.**, seven and five-eighths miles distant; Monomoy Point Light-house **NW. by N.**, nearly eleven miles distant; and Nantucket Light-house **W. $\frac{1}{8}$ S.**, ten miles and a quarter distant. The depth will be eleven fathoms and the course **W. by N. $\frac{1}{4}$ N.**, following the directions for this channel. (See pages 115-116.)

II. Having come through the Cat Island Channel and intending to enter Nantucket Sound.—From Half-way Rock steer **SE. $\frac{1}{2}$ S.** until the northern extremity of Race Point bears **WSW.** Southerly, and Highland Light-house **SE. by S. $\frac{3}{8}$ S.**, six and a quarter miles distant, when the depth will be between twenty-three and twenty-four fathoms and the course **SE. $\frac{1}{2}$ S.**, following the directions given above.

III. Having come through the Main Channel and intending to enter Nantucket Sound.—With Baker's Island Light-houses bearing **W. by N. $\frac{1}{2}$ N.**, three miles distant, and Eastern Point Light-house **NE. $\frac{1}{2}$ E.**, nearly four miles distant, the depth will be twenty-two fathoms, "fine grey sand." From this point the course is **SE. $\frac{1}{8}$ S.** until the northern extremity of Race Point bears **WSW.** Southerly, and Highland Light-house **SE. by S. $\frac{3}{8}$ S.**, six and a quarter miles distant, as before. The depth will be from twenty-three to twenty-four fathoms, and the course **SE. $\frac{1}{2}$ S.** until up with Highland Light-house, following the directions given above.

The above courses from Salem will cross the tail of Stellwagen's Bank in from twelve to eighteen fathoms water,—the bottom being mostly coarse sand and broken shells. On striking the northwestern edge of the bank a vessel following either of these courses will be about sixteen miles to the northward of Highland Light-house and from ten to eleven miles **N. $\frac{1}{2}$ W.** from Race Point Light-house. On leaving the bank and again striking twenty fathoms water, Race Point Light-house will bear from **S. by W. $\frac{3}{4}$ W.** to **SW. by S. $\frac{3}{4}$ S.**, according to the courses sailed, and will be distant six miles and a half; while Highland Light-house will bear from **SE. by S.** to **SE. by S. $\frac{1}{2}$ S.**, and will be distant ten miles and a half.

SAILING DIRECTIONS

FOR VESSELS BOUND FROM GLOUCESTER THROUGH NANTUCKET AND VINEYARD SOUNDS.

With Eastern Point Light-house bearing **NE. $\frac{1}{2}$ E.**, one mile and an eighth distant, and Ten Pound Island Light-house **NE. by N. $\frac{1}{2}$ N.**, there will be fifteen fathoms water; and the course thence is **SE. by S.** Southerly for forty-three miles, which will lead, with not less than fourteen fathoms, to abreast of Highland Light-house. When this light-house bears **SW. by W. $\frac{1}{2}$ W.**, a mile and a half distant, the course will be **S. by E. $\frac{1}{4}$ E.** along the beach, following the directions previously given. (See pages 101-102.)

The course from Gloucester crosses the southern half of Stellwagen's Bank in from fourteen to seventeen fathoms water, "coarse sand, pebbles and gravel." On first striking the bank from the northward Race Point Light-house will bear **S. $\frac{1}{8}$ E.**, distant a little over thirteen miles, and Highland Light-house will bear **SE. by S. $\frac{1}{2}$ S.**, distant eighteen miles and a quarter. On leaving the bank on its southern side and first striking twenty fathoms, Race Point Light-house will bear **SW. by S. $\frac{1}{4}$ S.**, seven and three-eighths miles distant, and Highland Light-house **SSE.**, a little over ten miles distant. These bearings and distances will be of service to vessels in thick weather, provided the courses have been made good.

SAILING DIRECTIONS

FOR VESSELS BOUND FROM CAPE ANN THROUGH NANTUCKET AND VINEYARD SOUNDS.

When the southernmost of the Thatcher's Island Light-houses bears **W. $\frac{1}{4}$ S.**, a mile and five-eighths distant, and Straitsmouth Island Light-house **NW. $\frac{3}{4}$ W.**, two miles and a half distant, the depth will be twenty-four fathoms and the course **SSE.** for nearly forty-three miles, or until High-

land Light-house bears **SW.** by **W.** $\frac{1}{2}$ **W.**, distant one mile and a half, as before; after which the course along the beach will be **S.** by **E.** $\frac{1}{4}$ **E.**, following the directions previously given. (See pages 101-102.)

The course from Cape Ann crosses the eastern edge of Stellwagen's Bank in from eighteen to nineteen fathoms, with occasional soundings of twenty and twenty-one fathoms. But, on leaving the bank, and continuing to get soundings of twenty-one fathoms, Race Point Light-house will bear **SSW.** Westerly, distant eleven miles, and Highland Light-house **S.** by **E.** $\frac{1}{4}$ **E.**, thirteen and a quarter miles.

MUSKEGET CHANNEL.

This channel, which is principally used by vessels which have passed outside of Nantucket Shoals, (or have intended to pass outside of them, when coming from the westward, and are compelled to make a harbor.) is a somewhat narrow, but straight and good passage, with not less than three and a quarter fathoms in it at mean low water. It runs nearly **N.** and **S.** along the eastern shore of Chappaquiddick Island to Cape Poge, and its entire length is about eight miles and a half. Its narrowest part is near its southern entrance, between Mutton Shoal on the east and Skiff Shoal on the west, where it is only eight hundred yards wide; but it widens after passing Mutton Shoal buoy, and runs, with an average width of half a mile, between Cape Poge Flats and Hawes' Shoal, and joins the South Channel about a mile and a quarter to the northeastward of Cape Poge.

This channel is rarely used on account of its dangerous shoals, broken bottom and conflicting currents: and it should never be attempted at night.

DANGERS

ON APPROACHING AND ENTERING NANTUCKET AND VINEYARD SOUNDS BY THE MUSKEGET CHANNEL.

I. *Coming from the Southward and Eastward.*—In approaching from the eastward the first danger met with is a large patch of shoal ground, consisting of a great number of spots with from fourteen to eighteen feet water upon them. It extends in a **NE.** and **SW.** direction, covering an area about two miles and a half long, and leaving a channel nearly a mile wide between its eastern end and the western side of the great Muskeget Bank. This channel is not, however, available for strangers. Soundings of from three to four fathoms are found in different places over this shoal ground; but no vessel of greater draught than nine feet should attempt to cross it. Its western extremity, which is formed by a shoal spot with eighteen feet upon it, lies nine miles due **S.** of Cape Poge Light-house and five miles **S.** $\frac{1}{2}$ **E.** from Wasque Bluff, at the southeastern extremity of Chappaquiddick Island. The buoy on Mutton Shoal bears from it **N.** $\frac{3}{4}$ **E.**, nearly three miles and a quarter distant. To avoid it in entering, vessels must not go to the eastward of Cape Poge Light-house bearing **N.** $\frac{1}{4}$ **E.**; or, in the event of not seeing the light, should not stand into less than five fathoms.

Muskeget Bank is that extensive area of shoal ground which has from five to seventeen feet upon it, and makes off to the westward from Muskeget Island for two miles, to the southward the same distance, and so obstructs the channel on the western side of Mutton Shoal as to render it unsafe for strangers of greater draught than six feet. The great body of the shoal has from fourteen to sixteen feet upon it, but there are numerous spots with from five to eleven feet. The most westerly of these shoal spots is a rock with seven feet, known as *Muskeget Rock*, which lies a *Muskeget Bank* little over two miles **W.** $\frac{1}{2}$ **N.** from the northern end of Muskeget Island, and is marked by a red spar-buoy (No. 2) placed in twelve feet a quarter of a mile to the westward of the rock. From this buoy the red buoy on the southwestern end of Hawes' Shoal bears **N.** by **W.** $\frac{3}{4}$ **W.** Westerly, distant three miles and a half. Half a mile **E.** by **S.** from this buoy is a rocky shoal, called *Bass Ledge*, with from five to ten feet upon it, and extending in a **SE.** by **E.** and **NW.** by **W.** direction for five-eighths of a mile.

Wasque Shoal lies on the western side of the entrance to this channel and forms the larger portion of that great mass of shoal ground which extends to the southeastward and southwestward from Wasque Bluff, and includes within its limits Skiff Island and Skiff Shoal. Wasque Shoal has from three to seventeen feet water upon it,—the shoalest water being along the southern side of the eastern half. It extends, first, **W.** by **S.** for a mile and three-quarters, within *Wasque Shoal*. Such limits is contained nearly all of the shoalest water; then **S.** by **W.** for nearly two miles; thus forming nearly a right angle. The shoal water along the southern side of the eastern half lies over short narrow sand-spits, separated from each other by narrow passages with from eight to ten feet water in them; but the western arm (that which runs **N.** and **S.**) has in no place less than thirteen feet, and in few places less than sixteen feet. Its southern extremity, which marks the western boundary of the entrance to Muskeget Channel, bears from Cape Poge Light-house **S.** by **W.** $\frac{3}{4}$ **W.**, distant three miles; and from it the red buoy on Mutton Shoal bears **NE.** by **E.**, three miles and a quarter distant. The entrance is here two miles and three-quarters wide, between Wasque Shoal and the shoal ground on the eastern side of the channel; but neither of these is buoyed. Passing between the two shoals, the course leads to the northward towards Mutton Shoal, the red spar-buoy on which will soon appear directly ahead. Mutton Shoal is the name given to the western end *Mutton Shoal*.

of an extensive piece of shoal ground, three miles and a quarter long in an **E NE.** and **W SW.** direction with from six to twelve feet water upon it. The buoy marks its western extremity, as well as the most difficult and dangerous part of the channel, which is here only eight hundred yards wide with a three knot current. The buoy is placed in twenty feet water, marked No. 2, and bears from Cape Poge Light-house **S.**, distant nearly five miles and three-quarters.

Vessels of large draught should not, as a rule, before coming up with Mutton Shoal, stand to the eastward of Cape Poge Light-house bearing **N. $\frac{1}{4}$ W.**, as there is a shoal with fifteen feet upon it lying **SE.** by **S. $\frac{1}{2}$ S.** from Mutton Shoal buoy and **S.** by **E.** from Cape Poge Light-house, and nearly midway between Mutton Shoal and the flat ground on the eastern side of the entrance to this channel. It is not, however, in the way of vessels entering with a fair wind.

When up with the red buoy on Mutton Shoal it is necessary to look out, on the western side of the channel, for Skiff Shoal, an area of shoal ground surrounding a low flat islet, called **Skiff Island**, lying a mile and an eighth **S SE.** from Wasque Bluff. Skiff Shoal joins the eastern end of Wasque

Skiff Shoal. Shoal, and extends three-eighths of a mile to the southeastward of the islet, the same distance to the northward, and five-eighths of a mile to the westward. The soundings vary from four to eleven feet. It is not buoyed, but should be, as this is the worst part of the channel,—the current running from two and a half to three miles an hour. Cape Poge Light-house bearing **N.**, after passing the buoy on Mutton Shoal, will just clear Skiff Shoal. There is a channel with three and a quarter fathoms in it on the northern side of Wasque and Skiff shoals, between them and Cotamy Beach, but it is exceedingly narrow in some places, dangerous, and totally unfit for strangers.

The eastern shore of Chappaquiddick is bordered by flats extending from a quarter to three-quarters of a mile from shore, and vessels should be careful to use the lead and not go inside of three and a quarter fathoms. A black spar-buoy (the first buoy met with after passing Mutton Shoal) marks

Tom's Shoal. the eastern edge of one of these flats, called Tom's Shoal, which has six feet water upon it, and is about a mile and a half above Wasque Bluff. This buoy is marked No. 1, placed in eighteen feet water, and bears from Mutton Shoal buoy **N. $\frac{1}{4}$ E.**, three miles and an eighth; from Cape Poge Light-house **S. $\frac{1}{4}$ E.**, two miles and five-eighths; and from the red spar-buoy (No. 4) on the southwestern end of Hawes' Shoal **W. $\frac{3}{8}$ S.**, distant a little over three-quarters of a mile, which is here the width of the channel.

Hawes' Shoal, which forms the eastern boundary of Muskeget Channel from abreast of Tom's Shoal to its northern end, and from its southern end to its junction with the South Channel of Nantucket Sound, has been already described (see page 113) as a very extensive piece of shoal ground of triangular shape, which extends from **E.** to **W.** for two miles and five-eighths, and from **N.** to **S.** two miles and three-quarters. Over this large space soundings varying from four to sixteen feet are found; but the most dangerous portions of the shoal are on its southeastern and western sides and at its north-

Hawes' Shoal. western end,—from four to six feet being found on the former and from five to twelve feet on the latter. The red spar-buoy above mentioned is placed on its southwestern

extremity in fifteen feet water, and marks the eastern boundary of Muskeget Channel at this point. It is marked No. 4, and bears from Cape Poge Light-house **S.** by **E. $\frac{3}{8}$ E.**, two miles and five-eighths distant. From this buoy the western side of Hawes' Shoal extends about **N. $\frac{1}{2}$ E.** for two miles and five-eighths, with nothing to mark its position except the rips of the tide. But at its northern extremity there is placed, in eighteen feet water, a black spar-buoy (No. 13), which marks the eastern side of the northern entrance to Muskeget Channel. This buoy bears from Cape Poge Light-house **E. $\frac{1}{4}$ N.**, one mile and five-eighths; from the black buoy (No. 15) on the northern end of Cape Poge Flats **E SE.** Southerly, a mile and three-eighths; and from Cross Rip Light-vessel **W. $\frac{1}{8}$ S.**, five miles and three-quarters distant.

To avoid this western side of Hawes' Shoal when the rips cannot be seen, it is only necessary to use the lead constantly and with judgment,—going about as soon as it strikes three fathoms.

The eastern side of Chappaquiddick Island is, as before mentioned, lined by extensive flats from

Cape Poge Flats.

Wasque Bluff to Cape Poge. These flats, called Cape Poge Flats, extend from three-eighths to three-quarters of a mile from shore, thus forming the western boundary of Muskeget Channel. Soundings varying from six to sixteen feet are found along their length,—the shoalest portion being in the neighborhood of Tom's Shoal, where there is a black buoy (No. 1) placed in fifteen feet water on the edge of the channel. There are no other buoys until up with the northern end of the flats, three-quarters of a mile to the northwestward of Cape Poge, where there is a black spar-buoy (No. 15) placed in three fathoms. The only direction that can be given for avoiding Cape Poge Flats is to use the lead constantly and not go inside of three fathoms.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING NANTUCKET AND VINEYARD SOUNDS BY THE MUSKEGET CHANNEL

I. Coming from the Southward and Eastward.—Cape Poge Light-house should be brought to bear **N.** about ten miles off and steered for, carrying not less than three and three-quarter fathoms

water. This course leads up to Mutton Shoal buoy, passing to the westward of it. *Sailing Directions--Muskeget Channel.* When up with the buoy the course is **N. $\frac{3}{8}$ E.** for exactly a mile, or until Wasque Bluff bears **NW. $\frac{1}{2}$ W.** and Cape Poge Light-house **N. $\frac{1}{8}$ W.** This course carries not less than three and three-quarter fathoms, and at the bearing there will be four and a half fathoms. From this point **N. by E.** leads straight through the channel, with not less than three and a quarter fathoms, into Nantucket Sound. When Cape Poge Light-house bears **W. by S. $\frac{1}{8}$ S.**, a mile and one-eighth distant, and Cross Rip Light-vessel **E.**, six miles and three-eighths distant, the course will be **NW. $\frac{1}{8}$ W.**, carrying not less than three and a quarter fathoms, and joining the Main Channel between Squash Meadow and The Hedge Fence. Here will be found ten fathoms water, "hard sand;" Holmes' Hole Light-house will bear **W. by N. $\frac{3}{8}$ N.** and Nobska Point Light-house **NW. by W.**; and the latter course should be steered if bound to the westward through Vineyard Sound.

The above courses pass three-eighths of a mile to the westward of the main body of the shoal ground **W.** of Muskeget Bank; an eighth of a mile to the eastward of the "eighteen-foot spot" which marks the limits of the shoal on the eastern side of the entrance; one hundred yards to the westward of the red buoy (No. 2) on Mutton Shoal; the same distance to the eastward of Skiff Shoal; a quarter of a mile to the eastward of Skiff Island; the same distance to the eastward of the black buoy (No. 1) on Tom's Shoal; nearly half a mile to the westward of the red buoy (No. 4) on the southwestern end of Hawes' Shoal; five-eighths of a mile to the westward of the black buoy (No. 13) on the northwestern end of Hawes' Shoal; a quarter of a mile to the northward of the black spar-buoy (No. 21) on the northern end of Cape Poge Flats; a little over a mile to the southward of the striped buoy on the eastern end of The Hedge Fence; and half a mile to the northward of the black buoy (No. 19) on the eastern end of Squash Meadow Shoal.

DANGERS

IN APPROACHING AND ENTERING NANTUCKET AND VINEYARD SOUNDS BY THE MUSKEGET CHANNEL.

II. *Coming from the Southward and Westward, to enter by the Main Passage.*—In approaching from the westward, the first danger met with is Wasque Shoal, already described on page 119 as the larger portion of that great extent of shoal ground which extends to the southeastward and southward from Wasque Bluff, and includes within its limits Skiff Island and Skiff Shoal. Wasque Shoal has from three to seventeen feet water upon it,—the shoalest water being along the southern side of the eastern half. It extends, first **W. by S.** for one mile and three-quarters, within which limits is contained nearly all of the shoalest water; then **S. by W.** for nearly two miles,—thus forming nearly a right angle. The shoal water along the southern side of the eastern half lies over short, narrow sand-spits, separated from each other by narrow passages with from eight to ten feet water in them; but the western arm (that which runs **N.** and **S.**) has in no place less than fourteen feet, and in few places less than sixteen feet. Its southern extremity, which marks the western boundary of the entrance to Muskeget Channel, bears from Cape Poge Light-house **S. by W. $\frac{3}{4}$ W.**, distant eight miles; and from it the red buoy on Mutton Shoal bears **NE. by E.**, three miles and a quarter distant. The entrance is here two miles and three-quarters wide between Wasque Shoal and the shoal ground on the eastern side of the channel; but this shoal ground is not approached by vessels from the westward unless they should be standing to the eastward on a wind, in which case they should go about as soon as Cape Poge Light-house bears **N. $\frac{1}{4}$ E.**, or (should they not see the light) when the lead shows five fathoms.

Joined to the northeastern end of Wasque Shoal is Skiff Shoal, already described, on page 120, as the mass of shoal ground surrounding Skiff Island, from which it extends three-eighths of a mile to the southeastward, the same distance to the northward, and five-eighths of a mile to the westward. The soundings vary from four to eleven feet. It is not buoyed, but should be, as this is the worst part of the channel,—the current running from two and a half to three miles an hour. Cape Poge Light-house bearing **N.**, after passing the buoy on Mutton Shoal, will just clear Skiff Shoal. There is a channel with three and a quarter fathoms in it on the northern side of Wasque and Skiff shoals, between them and Cotamy Beach; but it is exceedingly narrow in some places, dangerous, and totally unfit for strangers.

On the eastern side of the channel, exactly opposite to the northeastern end of Wasque Shoal, will be seen a red spar-buoy. This is on Mutton Shoal, and here the channel is only eight hundred yards wide, with a strong current during both flood and ebb. Mutton Shoal is the name given to the western end of an extensive piece of shoal ground, three miles and a quarter long in an **E NE.** and **W SW.** direction, with from six to twelve feet water upon it. The buoy is marked No. 2, placed in twenty feet water, and bears from Cape Poge Light-house **S.**, distant nearly five miles and three-quarters.

Vessels of large draught should not, as a rule, before coming up with Mutton Shoal, stand to the eastward of Cape Poge Light-house bearing **N. $\frac{1}{4}$ W.**, as there is a shoal with fifteen feet upon it lying **SE.** by **S. $\frac{1}{2}$ S.** from Mutton Shoal buoy and **S.** by **E.** from Cape Poge Light-house, and nearly midway between Mutton Shoal and the flat ground on the eastern side of the entrance. It is not, however, in the way of vessels with a fair wind.

When past Mutton Shoal the only dangers are Hawes' Shoal on the east and Tom's Shoal and Cape Poge Flats on the west; all of which are common to both eastern and western channels, and have been already described on page 120.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING NANTUCKET AND VINEYARD SOUNDS BY THE MUSKEGET CHANNEL.

II. Coming from the Southward and Westward, to enter by the Main Passage.—Cape Poge Light-house should be brought to bear **N.** by **E.**, with seventeen fathoms water, when it will be eleven and a quarter miles distant; and **NE.** by **N. $\frac{1}{2}$ N.** will lead, with not less than four and a half fathoms, up to Mutton Shoal buoy. Thence the course is **N. $\frac{1}{2}$ E.** for one mile, or until Wasque Bluff bears **NW. $\frac{1}{2}$ W.** and Cape Poge Light-house **N. $\frac{1}{4}$ W.**, when **N.** by **E.** will lead safely through the channel, following the directions given on page 121.

The above courses pass a mile and five-eighths to the eastward of the southwestern end of Wasque Shoal; three-eighths of a mile to the eastward of its eastern end; one hundred yards to the westward of Mutton Shoal buoy; the same distance to the eastward of Skiff Shoal; a quarter of a mile to the eastward of Skiff Island; the same distance to the eastward of the buoy on Tom's Shoal; half a mile to the westward of the red buoy on the southwestern end of Hawes' Shoal; and two hundred yards to the eastward of the easternmost point of Cape Poge Flats.

DANGERS

IN APPROACHING AND ENTERING NANTUCKET AND VINEYARD SOUNDS BY THE MUSKEGET CHANNEL.

III. Coming from the Southward and Westward, to enter by the Eastern Passage.—This passage leads between Long Shoal on the east and south and Hawes' and Norton's shoals on the west and north. Thence it passes between Edwards' Shoal on the south and Fourteen Feet Shoal and Cross Rip on the north, and joins the Main Channel of Nantucket Sound three miles and a quarter to the eastward of Cross Rip Light-vessel. It is not recommended to strangers, (although it has deep water in it,) as it is not well buoyed and the currents both of flood and ebb set obliquely across the channel. Between the southeastern end of Norton's Shoal and the northern end of Long Shoal it is only three-eighths of a mile wide; and between Edwards' Shoal and Cross Rip it is three-quarters of a mile wide.

The entrance is by the Main Passage (the dangers being the same as those just described) until within three-quarters of a mile of the black buoy on Tom's Shoal and a mile and an eighth from the red buoy on the southwestern end of Hawes' Shoal, where it strikes off to the northeastward, passing along the southern side of Hawes' Shoal. The first danger met with is Long Shoal, which lies on the eastern side of the passage, and is dry in places at low spring-tides, and in others has from two to seven feet water upon it. It is a sand bar of irregular shape, having a general direction about **NE.** and **SW.** and a length of two miles and a quarter. Its southern extremity begins about a quarter of a mile to the westward of the western end of the West Shovelful, (see page 106,) with Cross Rip Light-vessel bearing **NE. $\frac{1}{4}$ N.**, and here there is found thirteen feet. From this point it runs first **NW.** by **W.** for a mile, with soundings varying from six to eleven feet, and then with an abrupt turn runs **NE.** for a little over two miles—the depths ranging from two to seven feet at mean low water. On this northern end is placed, in three fathoms, a red spar-buoy (No. 6), which marks the southern limits of the Eastern Passage. It bears from

	Miles.
Cross Rip Light-vessel, SW. $\frac{3}{4}$ W. -----	2 $\frac{3}{4}$
Cape Poge Light-house, E. by S. $\frac{1}{2}$ S. -----	5 $\frac{1}{2}$
Red buoy on the southwestern end of Hawes' Shoal, E. by N. $\frac{1}{4}$ N. -----	4 $\frac{1}{2}$

Between it and the southeastern end of Norton's Shoal the channel has from four to ten fathoms water. Norton's Shoal lies on the northern side of this passage,—its western end being separated from the northeastern end of Hawes' Shoal by a passage only one hundred yards wide. It is a sand shoal, with ten feet water, extending **W.** by **N.** and **E.** by **S.**, and a mile and three-quarters long. The shoal of the bank bears **SW.** by **W. $\frac{1}{4}$ W.** from Cross Rip Light-vessel, distant nearly two miles and a quarter; and shoal water extends from it to the westward one mile and three-eighths. A black nun-buoy* of the second class (No. 11) is placed on its

northern side, as a guide to vessels passing through the Sound; but there should be another black buoy on its southeastern end, to enable vessels to pass safely through the Eastern Passage from Muskeget Channel. At present, the best rule for avoiding it is not to go inside of three fathoms water.

Nearly a mile to the northeastward of the red buoy on the northern end of Long Shoal lies Fourteen Feet Shoal, also on the northern side of the passage. It is a detached shoal, between five and six hundred yards long, with fourteen feet water upon it and from *Fourteen Feet Shoal.* three to six fathoms on all sides of it. It extends **N. by W.** and **S. by E.**,—its southern end bearing **SW. $\frac{1}{4}$ S.** from Cross Rip Light-vessel, distant one mile and three-quarters. It is not buoyed, though very much in the way of vessels using this passage. To avoid it, vessels should not go to the northward of Cape Poge Light-house bearing **W. $\frac{1}{8}$ N.**

When past Fourteen Feet Shoal it becomes necessary to look out, on the southern side of the channel, for another shoal with ten feet water, called Edwards' Shoal, which lies three-quarters of a mile **S. by W. $\frac{3}{4}$ W.** from the southern end of Cross Rip and is not buoyed. The ten-foot spot is on its eastern side, near the middle, and bears from Cross Rip Light-vessel *Edwards' Shoal.* **S. by W.** a little over two miles, and from the red buoy (No. 12) on the Broken Ground of the Horse-Shoe **SW. by W.**, three miles and a half distant. The northern end of the shoal bears from the red buoy on the northern end of Long Shoal **E. $\frac{1}{2}$ N.**, one mile and five-eighths distant; and between it and Cross Rip the channel is nearly three-quarters of a mile wide, with from four to eleven fathoms water.

On the northern side of the passage, three-quarters of a mile **N. by E. $\frac{1}{4}$ E.** from the northern end of Edwards' Shoal, lies Cross Rip, already described on pages 106 and 112. It has eleven feet upon it at mean low water, lies **N. by W.** and **S. by E.**, and is three-quarters of a mile long. Its southern end is not buoyed, but a black spar-buoy (No. 9) is placed *Cross Rip.* on its northern side as a guide to the Main Channel. A little over six hundred yards to the northeastward of the northern end of the shoal is placed Cross Rip Light-vessel, which shows a fixed white light from a height of thirty-nine feet above the sea. A bell is also rung in foggy weather.

To make the Eastern Passage available for strangers, buoys should be placed on the southeastern end of Norton's Shoal, on the southern end of Fourteen Feet Shoal, on the northern end of Edwards' Shoal, and on the southern end of Cross Rip. Such an arrangement will be recommended.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING NANTUCKET AND VINEYARD SOUNDS BY THE MUSKEGET CHANNEL.

III. *Coming from the Southward and Westward, to enter by the Eastern Passage.*—Cape Poge Light-house should be brought to bear **N. by E.**, with seventeen fathoms water, when it will be eleven and a quarter miles distant, and **NE. by N. $\frac{1}{8}$ N.** will lead safely up to Mutton Shoal buoy,—passing to the westward of it, and steering **N. $\frac{1}{2}$ E.** for one mile, or until Wasque Bluff bears **NW. $\frac{1}{2}$ W.** and Cape Poge Light-house **N. $\frac{1}{2}$ W.** From this point the course is **N. by E.** for one mile and three-eighths, carrying not less than three and a quarter fathoms, until Cape Poge Light-house bears **N. $\frac{1}{2}$ W.**, when the depth will be three and a half fathoms and the course **E NE.** for five miles and a quarter, with Wasque Bluff nearly over the stern. This course passes to the southward of Hawes' and Norton's shoals and to the northwestward of Long Shoal, and leads up with the red buoy (No. 6) on the northern end of the latter, passing to the northward of it three hundred yards distant. When up with this buoy Cross Rip Light-vessel will bear **NE. $\frac{1}{2}$ E.**, two miles and five-eighths distant; the depth will be eight fathoms, and the course **E. $\frac{1}{2}$ N.**, which will lead safely between Fourteen Feet Shoal on the north and Edwards' Shoal on the south, carrying not less than five fathoms, and joining the Main Channel three miles and a quarter to the eastward of Cross Rip Light-vessel.

The above courses pass five-eighths of a mile to the southward of the red spar-buoy (No. 4) on the southwestern end of Hawes' Shoal; an eighth of a mile to the southward of the southernmost point of that shoal; seven-eighths of a mile to the northward of the southwestern point of Long Shoal; one-eighth of a mile to the southward of the southeastern end of Norton's Shoal; three hundred yards to the northward of the red buoy (No. 6) on the northern end of Long Shoal; four hundred yards to the southward of Fourteen Feet Shoal; the same distance to the northward of Edwards' Shoal; and six hundred yards to the southward of Cross Rip.

There is another channel leading into Nantucket Sound from the southward, which passes between Muskeget Bank and Mutton Shoal, and then joins the Eastern Passage between Hawes' Shoal and Long Shoal; but it is crooked, dangerous, and entirely unfit for strangers.

LIGHT-HOUSES.

NAME.	Latitude.	Longitude West.			Fixed.	Height above sea-level.	Distance visible in nautical miles.
		In arc.		In time.			
	° ' "	° ' "	h. m. s.		Feet.		
Cross Rip Light-vessel	41 26 57	70 17 30	4 41 10	Fixed.	39	12	
Cape Poge Light-house	41 25 14	70 27 5	4 41 48	Fixed.	57	13	

CURRENTS.

LOCALITY.	Current.		Flood or Ebb.	Current turns after Moon's Meridian Passage.		Duration of Current.	
	Set.	Drift.		From E. to W.	From W. to E.	W.	E.
				h. m.	h. m.	h. m.	h. m.
East of Cape Poge Light-house	NE. $\frac{1}{2}$ E.	0.7	Flood	10 23	16 49	6 26	5 34
	SW. $\frac{1}{2}$ S.	0.8	Ebb				
Half a mile N NE. of Skiff Island	NE. by N. $\frac{1}{2}$ N.	2.4	Flood	10 29	16 50	6 21	5 39
	S. by W. $\frac{1}{2}$ W.	2.3	Ebb				
Between Muskeget Island and West Shoal	E. by N. $\frac{1}{2}$ N.	1.6	Flood				
	W. $\frac{1}{2}$ S.	1.7	Ebb				

VARIATION OF THE COMPASS.

The magnetic variation for 1880, off the southern end of Muskeget Channel, is 10° 46' W., with an annual increase of 2' nearly.

CHANNEL BETWEEN NO MAN'S LAND AND MARTHA'S VINEYARD.

This passage is sometimes used by vessels from the eastward bound either into Vineyard Sound or Buzzard's Bay. Between No Man's Land and Squipnocket Point it is two miles and three-quarters wide, and from four to eight fathoms can be safely taken through it; but there are several dangerous ledges which require special mention. No Man's Land is an island a mile and five-eighths long and seven-eighths of a mile wide in its widest part, extending in a nearly W. by N. and E. by S. direction two miles and three-quarters to the southwestward of Squipnocket Point. Seen from the eastward it appears as a comparatively low island, bare of trees, with precipitous sand cliffs at its southern end. On the northern side there are a few houses where the land is lowest. Shoal water extends from the northern side of this island to distances varying from a quarter to half a mile; but the southern side is bold and steep-to.

Squipnocket Point, on the northern side of the entrance, is the southwestern point of Martha's Vineyard, and is composed entirely of sand hillocks, bare of trees, and presenting precipitous yellow faces to seaward. It is not safe to approach this point, as dangerous ledges extend off from it to the southward for half a mile. From Squipnocket Point a long, flat sand beach, covered with hillocks, and for the greater part of its extent backed by thinly-wooded hills, extends in a NW. by N. direction nearly to Gay Head,—the whole distance being three miles and three-eighths. The southeastern portion of this beach is called Squipnocket Beach. It is not safe to approach this western end of Martha's Vineyard nearer than three-eighths of a mile, as there are shoals and dangerous ledges at intervals along its length.

Gay Head, the northwestern extremity of Martha's Vineyard, is a very remarkable headland,—appearing on passing it as a high, bare bluff, with remarkable perpendicular cliffs, which have a furrowed appearance, owing to the washings of innumerable rains. The yellow appearance of these cliffs is the more remarkable from the fact that the land on both sides of them looks dark—almost black—owing to the grass with which it is thickly covered. On the summit of the head, and but a short distance back from the edge of the cliff, stands the light-house, which is the guide to the Western Entrance to Vineyard Sound, and is known as Gay Head Light-house. It is a red brick tower, forty-one feet high, connected by a covered way with a dwelling-house of the same color; and shows a flashing red and white light, of the first order of Fresnel, from a height of one hundred and seventy feet above the sea. It flashes every ten seconds, (every fourth flash being red,) and is visible twenty miles. Its geographical position is

Latitude 41° 20' 52" N.
 Longitude 70° 50' 3" W.,

and it bears from

Nobska Point Light-house, SW. $\frac{1}{2}$ W.	12 $\frac{1}{2}$ miles.
Tarpaulin Cove Light-house, SW. $\frac{1}{2}$ S.	8 " nearly
Cuttyhunk Light-house, SE. $\frac{1}{2}$ S.	6 $\frac{1}{2}$ "
Vineyard Sound Light-vessel, SE. by E. $\frac{1}{2}$ E.	7 $\frac{1}{2}$ "
Block Island North Light-house, E. $\frac{1}{2}$ N.	34 "
Block Island Southeast Light-house, E. $\frac{1}{2}$ N.	34 $\frac{1}{2}$ "

DANGERS

IN THE CHANNEL BETWEEN NO MAN'S LAND AND MARTHA'S VINEYARD.

In approaching this channel from the eastward there will be seen, when off Squipnocket, a red spar-buoy well to the northward of the course, marked No. 2, and bearing about $N. \frac{1}{2} W.$, distant a little over a mile. This is on Squipnocket Ridge, a dangerous ledge of rocks which extends from Squipnocket Point $S. by W.$ for half a mile; is in some places bare at low water, and in others has from two to ten feet upon it. The buoy is placed in three fathoms off its southern end, and bears from the cliff at the southeastern end of No Man's Land $NE. \frac{3}{4} N.$, two miles and three-quarters, and from Gay Head Light-house $SE. by S. \frac{1}{2} S.$, four miles and an eighth distant. The sailing-line passes five-eighths of a mile to the southward of it.

Squipnocket Ridge.

When abreast of Squipnocket Ridge, a black spar-buoy will appear on the western side of the channel, bearing about $W. \frac{3}{4} S.$, and distant one mile. This is on Old Man Ledge, a dangerous sunken ledge, lying a little over three-quarters of a mile $N. by E. \frac{1}{2} E.$ from the northern point of No Man's Land; two miles $WSW.$ from Squipnocket Point; and a little over four miles $S. \frac{3}{4} E.$ from Gay Head Light-house. It has seven feet water upon it. The buoy is marked No. 1, placed in eighteen feet water on the northeastern side of the ledge, and the sailing-line passes well to the northward of it. There is a good channel, however, with not less than four fathoms, between Old Man Ledge and No Man's Land; and vessels may pass safely through it by giving the buoy a berth to the northward of not less than three-eighths of a mile.

Old Man Ledge.

Nearly half a mile $NW. \frac{1}{4} N.$ from the black buoy on Old Man Ledge will be seen another black spar-buoy, marked No. 3. This is on Lone Rock, a small detached ledge with eight feet at mean low water, and soundings of four and five fathoms on all sides of it. The buoy is placed on its northeastern side, in eighteen feet water, and bears from Gay Head Light-house $S. \frac{1}{2} E.$, three and five-eighths miles; from the red buoy on Squipnocket Ridge $W. \frac{1}{4} S.$, nearly two miles; and from the western extremity of No Man's Land $SW. by S.$ southerly, a mile and five-eighths distant. Between this rock and Old Man Ledge there is a channel with from three to four fathoms in it and an eighth of a mile wide.

Lone Rock.

After passing Lone Rock there are no dangers in this passage until up with Gay Head,—it being only necessary to keep about three-eighths of a mile from shore; but on passing Gay Head it will be necessary to look out for The Devil's Bridge, a dangerous ragged reef, a large portion of which is bare at low water, and which extends out five-eighths of a mile from land. In southerly and westerly gales the sea breaks with great violence over this reef and may be heard at a considerable distance; but the shoal is only dangerous in thick weather, or to vessels standing close in towards Gay Head. A black nun-buoy of the second class, marked No. 25, is placed in five fathoms water on the northwestern extremity of the reef, and, by vessels which have come through this passage, is left first to the eastward and then to the southward.

The Devil's Bridge.

SAILING DIRECTIONS

FOR THE CHANNEL BETWEEN NO MAN'S LAND AND MARTHA'S VINEYARD.

The western end of Cuttyhunk Island should be brought to bear $NW.$ by $N.$ and steered for, carrying not less than four and three-quarter fathoms water, until Gay Head Light-house bears $NE.$ by $E.$, a little over a mile distant, and Vineyard Sound Light-vessel $NW. \frac{3}{4} W.$, six and three-quarter miles distant; when the depth will be ten fathoms, and if bound to the westward $NW. \frac{3}{4} W.$ should be steered for Vineyard Sound Light-vessel until Cuttyhunk Light-house bears $N. \frac{3}{4} E.$, two and five-eighths miles distant, and the light-vessel is two miles off. The depth will be twelve fathoms, and the course $WNW.$ for Brenton's Reef Light-vessel; $W. \frac{3}{8} N.$ for Point Judith; and $W. by S. \frac{3}{4} S.$ to pass to the southward of Block Island.

But, if bound into Vineyard Sound, when Gay Head Light-house bears $NE.$ by $E.$, as before, the course is $N. \frac{1}{4} E.$ for a mile and five-eighths, carrying not less than six fathoms, until Gay Head Light-house bears $SE. \frac{1}{2} S.$, a mile and a quarter distant. The depth will be ten fathoms, "black sand," and the course through the Sound $NE.$ by $E.$, which will join the main sailing-lines three miles and a quarter to the westward of Nobeska Point Light-house, with Tarpaulin Cove Light-house bearing $W. \frac{1}{2} N.$ Or, the $NW.$ by $N.$ course towards Cuttyhunk Island should be continued until Gay Head Light-house bears $E.$ by $S. \frac{1}{2} S.$, when the depth will be eleven fathoms and the course $NE.$ by $E.$, as before.

The above courses pass three-quarters of a mile to the southwestward of the red buoy on Squipnocket Ridge; seven-eighths of a mile to the eastward of the black buoy on Old Man Ledge; the same distance to the eastward of Lone Rock; half a mile to the westward, and a little over half a mile to the northward, of the black nun-buoy off The Devil's Bridge.

On the above courses, to enter Tarpaulin Cove.—On the NE. by E. course through the Sound, when Tarpaulin Cove Light-house bears N. $\frac{1}{2}$ E., the course will be N. by E. $\frac{1}{2}$ E., carrying not less than ten fathoms, until abreast of the black buoy on Cove Rock; after which the directions for the harbor should be followed.

Having come through the Channel between No Man's Land and Martha's Vineyard, to enter Buzzard's Bay by passing to the westward of Cuttyhunk Island.—The course NW. $\frac{3}{4}$ W. for Vineyard Sound Light-vessel should be continued until up with it; whence the course is N. $\frac{1}{4}$ E., carrying not less than eleven fathoms, until Cuttyhunk Light-house bears SE. $\frac{1}{2}$ S.; when NE. by E. $\frac{3}{4}$ E. leads up the middle of the bay.

On this course (NE. by E. $\frac{3}{4}$ E.), to enter New Bedford Harbor: Clark's Point should be brought to bear N. $\frac{1}{8}$ E. and steered for, following the directions given for the harbor.

Having come through the Channel between No Man's Land and Martha's Vineyard, to pass through Quick's Hole and enter Buzzard's Bay.—With Gay Head Light-house bearing NE. by E., a little over a mile distant, as before, the course is N. $\frac{1}{4}$ E. until the light-house bears SE. $\frac{1}{2}$ S., when the depth will be ten fathoms, and N. by E. $\frac{3}{4}$ E. will lead up to the black buoy on the eastern end of Nashawena Flats. When abreast of this buoy the course is N. $\frac{3}{4}$ W. for three-quarters of a mile, which leads up to the red buoy on Quick's Hole Ledge with not less than five fathoms water. Thence N. $\frac{1}{4}$ E. leads safely into Buzzard's Bay; after which vessels should follow the directions given for this bay, or the several harbors therein.

HARBORS IN NANTUCKET AND VINEYARD SOUNDS.

On the northern side of Nantucket Sound there are several anchorages which afford shelter in northerly and easterly gales; but no harbors, properly so called. On the southern side is the harbor of Nantucket, now rarely used. In Vineyard Sound there are several excellent harbors on both the northern and southern shores, affording safe and convenient shelter for vessels bound either to the eastward or westward.

CHATHAM ROADS.

Of the harbors in Nantucket Sound the most easterly is called Chatham Roads, and lies at the northeastern end of the Sound, in the bight formed by the southern shore of Cape Cod on the north, Harding's Beach and Morris Island on the east, and the dry sand-spit to the northward of Monomoy on the south. It is a good anchorage in northerly and easterly gales, and is much resorted to by coasters and fishermen. If the gale be heavy and the vessel of less draught than eight feet, she may, at high water, enter **Stage Harbor**, which is contained between Morris Island on the east and Harding's Beach Point on the west. Here she may lie sheltered from all winds; but it is necessary to have a pilot, as the channel is narrow and intricate. Four feet at low water may be taken over the bar, and there is a rise of four feet; but the flats, dry at low water, obstruct both sides of the channel; and although it has been buoyed by the pilots it is unsafe for strangers.

For the convenience of vessels seeking an anchorage in Chatham Roads, the Light-House Board has recently (August, 1880) established a light-station on **Harding's Beach**,—six miles to the northward of Monomoy Point Light-house, and about five-eighths of a mile to the westward of the extremity of **Harding's Beach Point**. It is called **Harding's Beach Light-house**, and shows a fixed white light, of the fourth order of Fresnel, from a height of forty-five feet above the sea, visible twelve miles. The keeper's dwelling is painted white and stands about fifty feet to the southward of the tower,—the latter being thirty-five feet high, painted red, and surmounted by a black lantern. The geographical position of this light-house is

Latitude 41° 39' 30" N.
Longitude 69° 59' 2" W.

and it bears from Bishop and Clerk's Light-house E. by N. $\frac{1}{4}$ N., a little over thirteen miles distant. The range of the light-house on with the southernmost of the Chatham Light-houses will lead a vessel safely to an anchorage in the Roads.

From three to six fathoms, sticky bottom, will be found in Chatham Roads; and a stranger may easily reach the anchorage by following the directions given below.

DANGERS

IN APPROACHING AND ENTERING CHATHAM ROADS.

I. *From the Eastward, by the Main Channel.*—When up with Handkerchief Light-vessel the course leads to the northward, passing to the westward of Handkerchief Shoal, (or *The Handkerchief*) already described, on page 93, as a very extensive shoal of irregular shape, lying nearly NE. by N. and SW. by S., with a length of about three miles and three-quarters and a depth of from four to seventeen feet. It is well buoyed, having its northwestern, northeastern, eastern and southern ends

marked by large buoys; but vessels bound into Chatham Roads by this channel see only those on the southern and northwestern ends. The former is a red nun of the third class (No. 10), placed in four and a half fathoms about one hundred yards to the southward of the shoal, and bears from the light-vessel N. by W. $\frac{1}{2}$ W., three-eighths of a mile distant. From this buoy the general course of the western side of the shoal is about N. by E. $\frac{1}{4}$ E. for nearly a mile and an eighth, where it meets with the western entrance to the slue channel separating the Broken Part from the main body of the shoal, and which is here about three hundred yards wide. To the northward of this slue the western edge of the shoal continues in the same direction (N. by E. $\frac{1}{4}$ E.) for two miles and a half to the northwestern end, where is placed a black spar-buoy (No. 3) in twenty feet water. From this buoy Monomoy Point Light-house bears E. by S. S., a little over three miles, and Handkerchief Light-vessel S. by W. Westerly, four miles and three-eighths distant.

Handkerchief Shoal.

Vessels may safely pass between Handkerchief Light-vessel and the buoy on the southern end of the Broken Part, carrying not less than eight fathoms; but it is usual to go close to the former, passing it on either hand.

In standing to the northward along the western side of Handkerchief Shoal, vessels in order to avoid it must not go to the eastward of the light-vessel bearing S. by E. $\frac{1}{4}$ E., until Shovelful Light-vessel bears E. $\frac{1}{4}$ N., after which they should go about as soon as Handkerchief Light-vessel bears $\frac{1}{4}$ W.

When about three miles and a half to the northward of the light-vessel, a black spar-buoy will be seen well to the eastward of the course, and about a mile off. This is on the northern end of The Handkerchief, is marked No. 3, and placed in twenty feet water on the following bearings: From

	Miles.
Handkerchief Light-vessel, N. by E. Easterly -----	4 $\frac{3}{8}$
Monomoy Point Light-house, W. by N. $\frac{1}{4}$ E. -----	3 $\frac{1}{2}$
Shovelful Shoal Light-vessel, NW. $\frac{1}{4}$ W. -----	3 $\frac{1}{2}$

When up with this buoy the course turns to the northeastward, and vessels in beating must not stand to the eastward of Handkerchief Light-vessel bearing S. by W. $\frac{3}{4}$ W., in order to avoid Rogers' Shoal, with twelve feet water, which lies on the eastern side of the approach, and is marked by two red and black horizontally-striped buoys. (See description, given hereafter.)

A red spar-buoy (No. 4) will be seen, on coming abreast of Rogers' Shoal, well to the eastward, and bearing about ENE. This is on the southern side of what is known as The Shoal Spots, an extensive piece of shoal ground with from twelve to sixteen feet water, which lies to the westward of Monomoy Island, and close to the shoals which make off from Common Flats. The shoalest part has twelve feet, and is about three-eighths of a mile long in a NW. and SE. direction. The buoy is placed in three fathoms about a quarter of a mile to the southward of the twelve feet spot, and bears from

	Miles.
Monomoy Point Light-house, NW. -----	2 $\frac{5}{8}$
Shovelful Shoal Light-vessel, N. by W. $\frac{1}{2}$ W. -----	nearly 3 $\frac{1}{4}$
The black buoy on the northern end of The Handkerchief, NE. $\frac{3}{4}$ N. ----	1 $\frac{1}{2}$

To avoid this shoal, when in its vicinity, vessels should not stand to the eastward of Handkerchief Light-vessel bearing S. by W. $\frac{3}{4}$ W.

When clear of The Shoal Spots it will be necessary to look out for Common Flats, which are those extensive flats, for the most part dry at low water, making off to the westward and northward from the northern end of Monomoy Island. Shoal water extends to the westward from these flats, with from twelve to fifteen feet; and in beating great care is necessary to avoid them. A judicious use of the lead will, however, almost always keep a vessel clear, the rule being not to go inside of three and a half fathoms. A red spar-buoy, marked No. 2, is placed on the western side of these flats in three fathoms water, and bears from the northern end of Monomoy W. by N. $\frac{1}{4}$ N., two miles; from Chatham Light-houses SW. by W., four miles; and from Monomoy Point Light-house N. $\frac{3}{4}$ W., four miles distant. Vessels when up with this buoy, to avoid the flats, should not stand to the eastward of Monomoy Point Light-house bearing $\frac{1}{2}$ E.

Common Flats.

A mile and an eighth to the northward of the buoy on Common Flats will be seen another red spar-buoy, which marks the northwestern end of Common Flats as well as the eastern side of the entrance to Chatham Roads. It is marked No. 4, placed in three fathoms, and bears from the northern end of Monomoy NW. $\frac{1}{4}$ N., two and a half miles, and from Chatham Light-houses W. by S. $\frac{1}{2}$ S., three and a half miles distant. The sailing-line passes a little over a quarter of a mile to the northward of it, and a little over a mile to the eastward will be seen another red spar-buoy, off the northern end of what is sometimes called The Middle Ground, a shoal at the entrance to Stage Harbor. The buoy is marked No. 6, placed in eighteen

The Middle Ground.

feet close to a spot with eleven feet water, and bears from Chatham Light-houses **W. by S. $\frac{1}{2}$ S.**, two miles and a half, and from Harding's Beach Point **W. $\frac{3}{4}$ N.**, nearly one mile and a quarter distant.

On the northern side of the entrance vessels should beware of a dangerous shoal, upon which there is but five feet water, making off to the southward for about one mile and an eighth from abreast of Harwich. From the southern end of this bar shoal water extends half a mile farther,—sixteen feet being found a mile and three-quarters from shore. It is not buoyed and has no name; but that of Harwich Flats has been suggested for it. To avoid it, in beating into Chatham Roads, vessels when in its vicinity should not go to the northward of Chatham Light-houses bearing **E. by N. $\frac{1}{4}$ N.**

When in the Roads and standing to the northward towards the Harwich shore, vessels should keep about five-eighths of a mile from it, or should not go to the northward of Chatham Light-house bearing **E. $\frac{1}{4}$ N.**, to avoid the flats called *Red River Flats*, which make off from the mouth of Red River with from three to six feet water upon them.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING CHATHAM ROADS.

I. From the Eastward, by the Main Channel.—From Handkerchief Light-vessel the course is **NW. by N. $\frac{3}{4}$ N.** along the western side of The Handkerchief for about a mile, until Monomoy Point Light-house bears **NE. by E. $\frac{1}{4}$ E.** and Shovelful Light-vessel **E. by N. $\frac{1}{4}$ N.**, when the depth will be five fathoms, and **N. by E. $\frac{1}{2}$ E.** will lead, with not less than four fathoms, to abreast of the black buoy on the northwestern end of The Handkerchief. When this buoy is abeam, bearing **E. by S. $\frac{1}{2}$ S.** and a quarter of a mile off, **NE. by N. $\frac{1}{4}$ N.** will lead, with not less than three and a half fathoms, to the entrance to the Roads. When the southernmost of the Chatham Light-houses is in range with Harding's Beach Light-house on a bearing of **E. by N. $\frac{1}{2}$ N.** Nearly, that course, if steered, will lead, with not less than four fathoms, to the anchorage under Harding's Beach, where vessels may anchor at pleasure in from fifteen feet to four fathoms, according to draught.

The above courses pass one hundred yards to the westward of the red nun-buoy on the southern end of The Handkerchief; a quarter of a mile to the westward of the black spar-buoy on the northern end of that shoal; three-quarters of a mile to the westward of the red buoy on the southern end of The Shoal Spots; a mile and an eighth to the westward of the southernmost spar-buoy on Common Flats; three-quarters of a mile to the eastward of the "five feet spot" on Harwich Flats; five-eighths of a mile to the westward, and three-eighths of a mile to the northward, of the northernmost spar-buoy on Common Flats; five-eighths of a mile to the southward of Red River Flats; and close-to, to the northward of the red spar-buoy on The Middle Ground.

DANGERS

IN APPROACHING AND ENTERING CHATHAM ROADS.

II. From the Eastward, by the channel between Monomoy Point and The Handkerchief.—This channel is not suitable for strangers and can only be used in the day-time; but inasmuch as it is frequently used by fishermen and coasters of light draught, both in coming in and going out of the Roads, a description of it will not be out of place. Vessels which have come through Butler's Hole and intend to enter by this passage continue to the westward from Shovelful Shoal Light-vessel until within three-eighths of a mile of the red buoy on the southeastern end of The Handkerchief. Here the channel turns abruptly to the northward, leading between Monomoy Point and Handkerchief Shoal; then between Rogers' Shoal and the flats to the westward of Monomoy; crosses the southern end of The Shoal Spots, and enters Chatham Roads about three-eighths of a mile to the westward of the red buoy (No. 4) on Common Flats.

Wishing to enter this channel a vessel must, as before mentioned, steer to the westward from Shovelful Light-vessel, on which course a red spar-buoy will be seen bearing **W. $\frac{1}{4}$ S.**, half a mile distant. This is on the southeastern end of the main shoal of *The Handkerchief* before described on pages 93 and 127. The buoy is placed in three fathoms, marked **Handkerchief Shoal** No. 8, and bears from Monomoy Point Light-house **SW. $\frac{1}{4}$ W.**, two miles and an eighth; from Shovelful Shoal Light-vessel **W. $\frac{3}{4}$ N.**, one mile and a quarter; and from Handkerchief Light-vessel **NE.**, a little over three miles distant. From this buoy the red buoy on the western end of the Shovelful bears **NE. $\frac{1}{4}$ N.**, a little over half a mile, and the black buoy on the northeastern end of The Handkerchief **N. by E. $\frac{1}{4}$ E.**, nearly one mile distant.

When within three-eighths of a mile of the red buoy on the southeastern end of The Handkerchief, the course turns abruptly to the northward, and there will be seen to the eastward of the course

bearing $N. \frac{1}{4} W.$ and about three-eighths of a mile off, a red spar-buoy (No. 2). This is on the western end of Shovelful Shoal, which extends along the southeastern face of Monomoy Point at an average distance of over half a mile from shore; is in some places *Shovelful Shoal*. bare at low water, and in others has from two to ten feet upon it. From its northern end, which is within a quarter of a mile of the western end of Bearse's Shoal, its general course is about $SW.$ by $W. \frac{1}{2} W.$ until Monomoy Point bears $N.$ by $W. \frac{1}{2} W.$, when it turns about $W. \frac{3}{4} N.$ for a quarter of a mile, and then $NW. \frac{1}{2} N.$ for about six hundred yards to the point where the buoy is placed. Throughout this extent the soundings vary from one to ten feet. The light-vessel, before described, (see page 93,) is placed to the southward of the middle of the shoal, and the red spar-buoy, seen to the northeastward by a vessel bound in by this channel, marks the western end. When up with this last-mentioned buoy a black nun-buoy will be seen a little to the westward of the course, bearing about $N.$ by $W.$, and about half a mile off. This is on the northeastern end of The Handkerchief, and bears from

	Miles.
Monomoy Point Light-house, $W.$ by $S. \frac{1}{2} S.$ -----	1 $\frac{1}{2}$
Shovelful Light-vessel, $NW.$ -----	1 $\frac{1}{2}$
The red buoy on the western end of Shovelful Shoal, $N.$ by $W. \frac{1}{4} W.$ -----	1 $\frac{1}{8}$
Handkerchief Light-vessel, $NE. \frac{1}{2} N.$ -----	3 $\frac{7}{8}$

When up with the buoy on the northeastern end of The Handkerchief the channel continues to the northward, and there will soon be seen well to the westward of the course, bearing about $NW. \frac{3}{4} N.$, and half a mile off, a spar-buoy, painted red and black in horizontal stripes. This is on the southeastern end of Rogers' Shoal, which is the name given to a detached shoal extending in a $NW. \frac{3}{4} N.$ and $SE. \frac{3}{4} S.$ direction, with twelve feet water. Between the lines of three fathoms it is over three-quarters of a mile long, with a good channel not less than eight hundred yards wide between it and The Handkerchief, and another of equal width on its eastern side, *Rogers' Shoal*. between it and Monomoy Island. The channel between this shoal and The Handkerchief has in no place less than three and a quarter fathoms, while the eastern channel has not less than twenty-one feet at mean low water. The horizontally-striped buoy seen in coming through this channel is placed in fifteen feet; and half a mile $NW. \frac{3}{4} N.$ from it is placed another buoy with the same marks, in fourteen feet water, and about four hundred yards to the northward of the twelve-foot spot. This buoy is intended to be on the northwestern end of the shoal, but should be moved six hundred yards to the northwestward and placed in eighteen feet at low water.

The buoy on the southeastern end of Rogers' Shoal bears from Monomoy Point Light-house $W.$ by $N. \frac{1}{4} N.$, one mile and five-eighths; from Monomoy Point $NW.$ by $N. \frac{1}{2} N.$, one mile and an eighth; and from the black buoy on the northeastern end of The Handkerchief $N. \frac{3}{4} W.$, a little over three-quarters of a mile distant. The sailing-line passes well to the eastward of it.

The buoy near the northwestern end of Rogers' Shoal bears from

	Miles.
The southeastern buoy, $NW. \frac{3}{4} N.$ -----	1 $\frac{1}{2}$
Monomoy Point Light-house, $W NW.$ -----	2
The buoy on the $NE.$ end of The Handkerchief, $N.$ by $W. \frac{3}{4} W.$ -----nearly	1 $\frac{3}{8}$
The buoy on the northwestern end of The Handkerchief, $E. \frac{1}{2} S.$ -----	1 $\frac{1}{8}$

When past Rogers' Shoal the dangers met with are The Shoal Spots and Common Flats, both of which have already been described on page 127.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING CHATHAM ROADS.

II. *From the Eastward, by the channel between Monomoy Point and The Handkerchief.*—From Shovelful Shoal Light-vessel continue the course $W.$ by $N.$ for about a mile, or until Monomoy Point Light-house bears $NE.$ and Handkerchief Light-vessel $SW. \frac{1}{4} W.$ Here the depth will be seven fathoms and a half and you will be exactly in the entrance of the channel. Now steer $N. \frac{1}{2} W.$ for about three-eighths of a mile, carrying not less than eight fathoms, which will bring you up with the red spar-buoy on the western end of Shovelful Shoal, and Monomoy Point Light-house will bear $NE. \frac{3}{4} E.$ Now steer $N. \frac{1}{4} E.$, which will lead to the entrance to the Roads, crossing the tail of The Shoal Spots in fifteen feet, which will be the shoalest water found on this course. When the southernmost of the Chatham Light-houses is in range with Harding's Beach Light-house on a bearing of $E.$ by $N. \frac{1}{2} N.$ Nearly, steer that course, which will lead you up to the red buoy (No. 6) on the northern end of The Middle Ground. Pass to the northward of this, and anchor under Harding's Beach according to draught.

Sailing Directions--Chatham Roads. The above courses pass an eighth of a mile to the southward of the southwestern end of Shovelful Shoal; six hundred yards to the eastward of the southeastern end of The Handkerchief; fifty yards to the westward of the red spar-buoy on the western end of Shovelful Shoal; an eighth of a mile to the eastward of the black nun-buoy on the northeastern end of The Handkerchief; a quarter of a mile to the eastward of the striped buoy on the southeastern end of Rogers' Shoal; nearly five-eighths of a mile to the eastward of the red buoy on the southern end of The Shoal Spots; seven-eighths of a mile to the westward of the red spar-buoy (No. 2) on the western edge of Common Flats; three hundred and fifty yards to the northward of the red spar-buoy (No. 4) on the northwestern end of those flats; and close-to, to the northward of the red buoy (No. 6) on the northern end of The Middle Ground.

DANGERS

IN APPROACHING AND ENTERING CHATHAM ROADS.

III. From the Westward, having come through the North Channel of Nantucket Sound.—With Bishop and Clerk's Light-house bearing **W.** by **N.** $\frac{1}{4}$ **N.** and about a mile off, the course for Chatham Roads is **E.** by **N.** $\frac{1}{4}$ **N.**; and on this course the first danger met with is known as Kill Pond Bar, a very extensive shoal making off from the northern shore in a southeasterly direction,—its southern extremity bearing from Bishop and Clerk's Light-house **E.** by **N.** $\frac{1}{4}$ **N.**, distant nearly seven miles. This bar has on it from four to twelve feet water, and eight feet is found two miles and three-quarters **SE.** from the eastern point of entrance to Bass River. On the extremity of the bar, in three fathoms water, is placed a red spar-buoy (No. 6)—the course passing to the southward of it. This buoy is so small as to be entirely insufficient for a guide, and it is necessary to keep a bright look-out, even in day-time, in order to see it. A can or nun-buoy of the second class has been recommended to replace it. The present buoy bears from Bishop and Clerk's Light-house **E.** by **N.** $\frac{1}{4}$ **N.**, six miles and three-quarters distant.

When past Kill Pond Bar, if beating into the Roads, it is not safe to stand inside of three and a half fathoms on the southerly tack; or, if it be day-time, to stand to the southward of Chatham Light-houses bearing **NE.** by **E.** $\frac{1}{8}$ **E.**, to avoid the shallow water surrounding The Shoal

The Shoal Spots. Spots, an extensive piece of shoal ground, with from twelve to sixteen feet water, which lies to the westward of Monomoy Island and close to the shoals which make off from Common Flats. The shoalest part has twelve feet, and is about three-eighths of a mile long in a **NW.** and **SE.** direction. A red spar-buoy (No. 4) is placed in three fathoms about a quarter of a mile to the southward of the twelve feet spot; but vessels beating into Chatham Roads by this channel pay no attention to it. (See also page 127.)

On the northern side of the channel, a little over three miles to the eastward of Kill Pond Bar buoy, lie the dangerous Harwich Flats, which have but five feet water, and make off to the southward, from abreast of Harwich, for about a mile and an eighth. From the southern end of this bar shoal water extends half a mile farther,—sixteen feet being found one mile and three-quarters from shore. To avoid it, when beating, if it be day-time, vessels should not stand to the northward of Chatham Light-houses bearing **E.** by **N.** $\frac{1}{4}$ **N.**; or, at night-time, Bishop and Clerk's Light-house bearing **W.** by **S.**

The eastern side of the entrance is obstructed by Common Flats, which are those extensive flats, for the most part dry at low water, making off to the westward and northwestward from the northern end of Monomoy Island. Shoal water extends to the westward from these flats with from twelve to fifteen feet, and in beating great care is necessary to avoid them. A judicious use of

Common Flats. the lead will, however, almost always keep a vessel clear,—the rule being not to go inside of three and a half fathoms. A red spar-buoy, marked No. 2, is placed on the western side of these flats, in three fathoms water, and bears from the northern end of Monomoy **W.** by **N.** $\frac{1}{4}$ **N.**, two miles; from Chatham Light-houses **SW.** by **W.**, four miles; and from Monomoy Point Light-house **N.** $\frac{3}{4}$ **W.**, four miles distant. When to the northward of this buoy, to avoid the flats, vessels must not stand to the eastward of Monomoy Point Light-house bearing **S.** $\frac{1}{4}$ **E.**

A mile and an eighth to the northward of the buoy on Common Flats will be seen another red spar-buoy, which marks the northwestern end of Common Flats as well as the eastern side of the entrance to the Roads. It is marked No. 4, is placed in three fathoms, and bears from the northern end of Monomoy **NW.** $\frac{1}{4}$ **N.**, two miles and a half, and from Chatham Light-houses

The Middle Ground. **W.** by **S.** $\frac{1}{2}$ **S.**, three miles and a half distant. The sailing-line passes a little over a quarter of a mile to the northward of it; and when abreast of it another red spar-buoy will be seen about a mile to the eastward. This is on the northern end of what is sometimes called The Middle Ground, a shoal at the entrance to Stage Harbor. The buoy is marked No. 6, placed in eighteen feet water, and bears from Chatham Light-houses **W.** by **S.** $\frac{1}{2}$ **S.**, two miles and a half, and from Harding's Beach Point **W.** $\frac{3}{4}$ **N.**, about one mile and a quarter distant. There is

good anchorage near it, in from two to three fathoms; where, if bound into Stage Harbor, it is necessary to wait for a pilot.

On the northern side of the Roads the shore should not be approached nearer than five-eighths of a mile, to avoid *Red River Flats*, which make off from the mouth of Red River and the vicinity of South Harwich for half a mile, with from three to six feet water upon them. They are not buoyed, but a good rule to avoid them in day-time is not to go to the northward of Chatham Light-houses bearing **E. $\frac{1}{4}$ N.**

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING CHATHAM ROADS.

III. *From the Westward, having come through the North Channel of Nantucket Sound.*—On the **SE. $\frac{1}{4}$ E.** course for Handkerchief Light-vessel, bring Bishop and Clerk's Light-house to bear **W.** by **N. $\frac{1}{4}$ N.**, one mile distant; when the depth will be five fathoms, and the course **E.** by **N. $\frac{1}{4}$ N.**, carrying not less than three and a half fathoms to the entrance to the Roads. On this course, when abreast of Harwich Flats, with Monomoy Point Light-house bearing **S.** by **E. $\frac{1}{8}$ E.**, five miles distant, and the southernmost of the Chatham Light-houses is in range with Harding's Beach Light-house on a bearing of **E.** by **N. $\frac{1}{2}$ N.** Nearly, steer in on the range and anchor according to draught.

The above courses pass half a mile to the southward of the red spar-buoy on Kill Pond Bar; three-quarters of a mile to the southward of the five-foot shoal on Harwich Flats; about six hundred yards to the northward of the red spar-buoy on the northwestern end of Common Flats; five-eighths of a mile to the southward of Red River Flats; and close-to, to the northward of the red buoy on The Middle Ground.

Having come through the South or Main Channel of Nantucket Sound from the Westward, to enter Chatham Roads.—On the course **E.** by **S. $\frac{1}{4}$ S.** from Cross Rip Light-vessel, when Handkerchief Light-vessel bears **E. $\frac{3}{4}$ N.**, eight and a half miles distant; Bishop and Clerk's Light-house **N. $\frac{3}{8}$ E.**, seven miles and three-eighths distant; and the red buoy on the southern end of the Broken Ground of the Horse-Shoe **N.** by **E. $\frac{5}{8}$ E.**, half a mile distant; the depth will be nine and a quarter fathoms, and the course **NE. $\frac{1}{4}$ E.** for the entrance to the Roads, carrying from three to seven fathoms water. On this course, when Monomoy Point Light-house bears **S.** by **E. $\frac{1}{8}$ E.** and the range of the southernmost Chatham Light-house and Harding's Beach Light-house comes on, as before, steer **E.** by **N. $\frac{1}{2}$ N.** Nearly, (keeping the range,) which will lead safely to the anchorage.

STAGE HARBOR

is a narrow and shoal inlet of irregular shape, which makes in between the western shore of **Morris Island** and **Harding's Beach Point**.—a long sandy point, forming the eastern end of a sand beach called **Harding's Beach**,—upon which stands **Harding's Beach Light-house**. (See page 126.) This beach makes to the southeastward from the mouth of Red River, and is about two miles and three-quarters long, with sand hillocks near its eastern end. On the point may be seen a group of large white fish-houses, with projecting wharves; and it is just inside these wharves that the best anchorage is found.

Five-eighths of a mile above the entrance, at Harding's Beach Point, the inlet forming Stage Harbor branches,—sending one branch to the northeastward for a mile and a quarter behind Chatham Light-houses, and up to the southern end of the village, while the other, which is shoaler and much narrower, runs first to the northwestward for five-eighths of a mile behind Harding's Beach, and then turns abruptly to the northeastward for a mile and a quarter, terminating at the back of the village. The anchorage, which is just opposite to the dividing point, affords excellent shelter, with from two to two and a half fathoms, soft bottom; but only four feet at low water can be carried across the bar at its mouth. The **rise and fall** of tides is about four feet.

A pilot can be obtained at all times, and it is not possible for strangers to enter Stage Harbor without one. Vessels desiring to enter should anchor near The Middle Ground buoy and make the customary signal.

The South Channel into Chatham passes from Chatham Roads between Harding's Beach Point on the north and the dry flat making off from the northern end of Monomoy Island, and is about eight hundred yards wide. It then runs to the eastward close under **Morris Island Point**, and then to the northward, skirting the eastern shore of the island. Four feet at mean low water can be taken through this channel, but it is necessary to have a pilot.

BASS RIVER ROADS.

Between six and seven miles to the westward of Chatham Roads is the entrance to **Bass River**, a narrow, crooked and shallow stream running in a northeasterly direction, and of little importance. It bears from Monomoy Point Light-house **NW. $\frac{1}{4}$ W.**, a little over ten miles; from Bishop and Clerk's Light-house **NE. $\frac{1}{4}$ N.**, five miles and an eighth; and from Point Gammon (the eastern point of entrance to Hyannis Roads) **NE.** by **E. $\frac{1}{4}$ E.**, four miles distant. The village of **South Yarmouth** is built upon its western bank, about a mile above the mouth, but there is no passage to it,—there being only one foot of water on the bar at low tide.

No sailing directions can be given for the river, but anchorage may be found by small vessels off the entrance in what is known as Bass River Roads, well sheltered from all but southerly gales, which bring in a heavy sea, rendering the anchorage insecure. A breakwater, which has been commenced on the eastern end of Dog Fish Bar, was designed as a protection for small vessels in southerly gales; but in its present unfinished condition affords little shelter. From this breakwater

	Miles.
Point Gammon bears W. by S. $\frac{1}{4}$ S.	a little over 4
Bishop and Clerk's Light-house SW. $\frac{1}{4}$ W.	5 $\frac{1}{2}$
Handkerchief Light-vessel S SE. Southerly	10 $\frac{1}{2}$
Monomoy Point Light-house SE. $\frac{1}{4}$ E.	9 $\frac{1}{2}$

DANGERS

IN APPROACHING AND ENTERING BASS RIVER ROADS.

I. From the Eastward.—When up with Handkerchief Light-vessel steer NW. $\frac{1}{4}$ W., as if bound into the North Channel. On this course you will pass three hundred yards to the southward of the southern end of The Handkerchief, which is here marked by a red nun-buoy of the third class (No. 10), placed in four and a half fathoms about one hundred yards to the southward of the extremity of the shoal. *The Handkerchief*, as before described, (see pages 93 and 127,) is an extensive sand shoal of irregular shape, three miles and three-quarters long, and a mile and a half wide at its widest part, leaving a passage between the shoal and Monomoy Point, through which not less than three and a half fathoms may be taken. (See description of this channel, on pages 128–130.) The Handkerchief has from four to seventeen feet water upon it,—the shoalest water being near its western edge, and about midway between its northern and southern ends. The course for Bass River Roads leads along its western face at an average distance of a mile and a quarter; and to avoid this western face, in beating, vessels should not stand farther to the eastward than to bring Handkerchief Light-vessel to bear S. by E. $\frac{1}{2}$ E. until Shovelful Light-vessel bears E. $\frac{1}{4}$ N.; after which they should go about as soon as the former bears S. $\frac{1}{4}$ W.

When past The Handkerchief there are no dangers until you are within about three miles of the shore, when it is necessary to look out for Kill Pond Bar, a very extensive shoal, with from four to eight feet water, which makes off in a series of flats from the northern shore of Nantucket Sound, extending from Herring River to Bass River. On its southeastern extremity, seven miles E. by N. $\frac{1}{4}$ N. from Bishop and Clerk's Light-house, there is placed a red spar-buoy (No. 6) in three fathoms water. This buoy is not readily distinguished until close to it; and in view of the importance of its position, a can or nun-buoy has been recommended in its place. The course for the anchorage passes a mile and a quarter to the westward of this buoy, and does not approach the edge of the bar at any point nearer than three-eighths of a mile.

On the western side of the entrance, stretching along the northern shore from Bass River to Point Gammon, lies another great shoal, called Dog Fish Bar, an extensive flat with from three to twelve feet upon it, extending nearly a mile from shore. It is not, therefore, safe for vessels drawing over twelve feet to approach the northern shore between Bass River and Point Gammon nearer than a mile and a half. On the northeastern extremity of this bar is placed a black spar-buoy (No. 1) in twelve feet water, about one hundred and fifty yards NE. from the breakwater.

After passing the black spar (No. 1) on Dog Fish Bar, a red spar-buoy will be seen nearly ahead and to the westward of the course. This is off *Sunken Pier*, (where are the remains of an ancient shad-pier,) and has a keg on top. The course for entering the river passes to the eastward of it.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING BASS RIVER ROADS.

I. From the Eastward.—From Handkerchief Light-vessel steer NW. $\frac{1}{4}$ W. for a little over half a mile, or until Monomoy Point Light-house bears NE. by E. This course clears the southern end of The Handkerchief, and when the bearing comes on you must steer N. by W. $\frac{1}{4}$ W., carrying not less than three and a quarter fathoms, until Bishop and Clerk's Light-house bears W. by S. $\frac{1}{4}$ S. and you are in three and a half fathoms, sandy bottom. Now steer NW. by N. $\frac{1}{4}$ N., which will lead you safely to the anchorage to the northeastward of the breakwater, where vessels may anchor in from twelve to fifteen feet, sandy bottom.

In southerly winds, vessels of light draught may round the breakwater, giving it a berth to the westward of about two hundred yards, when they will have not less than ten feet water, and may come to on its northern side in from eight to twelve feet, near the buoy on Dog Fish Bar. There is, however, very little shelter here in southerly winds; and, if the tide be favorable, small vessels should make a signal for a pilot and enter the river.

DANGERS

IN APPROACHING AND ENTERING BASS RIVER ROADS.

II. *From the Westward, having come through the North Channel of Nantucket Sound.*—The eastern part of the North Channel is a mass of shoals and ledges; but these are for the most part well buoyed, and those which are not marked are not dangerous except to vessels of large draught. When off Point Gammon, with the tower bearing NE. by N. $\frac{1}{4}$ N., one mile distant, the appearance of this end of the channel will be as follows:

A little to the northward of the course, about half a mile distant, and bearing SE. by E. $\frac{1}{2}$ E., will be seen a spar-buoy, painted red and black in horizontal stripes. This is on Hallet's Rock, with eight feet at mean low water, which bears from Point Gammon Tower S., one mile and a quarter, and from Bishop and Clerk's Light-house N. by W. $\frac{1}{2}$ W., one mile and an eighth distant. The buoy is placed in twenty feet on its western side, and the sailing-line passes an eighth of a mile to the southward of it. To avoid this rock at night, vessels beating through the North Channel should not, when in its vicinity, stand farther to the northeastward than to bring Bishop and Clerk's Light-house to bear S SE. Easterly.

To the northeastward of Hallet's Rock buoy, but more distant, bearing about E., one mile and an eighth off, will be seen a red spar-buoy. This is on Senator Shoal, a part of the shoal ground extending off to the southeastward from Point Gammon, and joining the western end of Dog Fish Bar. It has seven feet at mean low water, and bears from

	Miles.
The buoy on Hallet's Rock, NE. by E. $\frac{1}{2}$ E.-----	$\frac{3}{8}$
Point Gammon Tower, SE. by S.-----	1
Bishop and Clerk's Light-house, N. $\frac{1}{4}$ E.-----	1 $\frac{1}{2}$

The buoy is marked No. 8, placed in sixteen feet water on its southeastern end, and the sailing-line passes well to the southward of it. The bottom is rocky on this shoal, but the buoy is placed in sandy bottom.

On the southern side of the channel, bearing about SE. by S. $\frac{1}{2}$ S., will appear Bishop and Clerk's Light-house, a tall granite tower, rising from a mass of rocks which are about ten feet above the water. The shoal water and broken ground surrounding this light-house is known as Bishop and Clerk's Shoal, and has from four to eleven feet upon it at mean low water. It extends from the light-house in a NW. direction for one mile and in a S. $\frac{1}{2}$ E. direction seven-eighths of a mile. The dry rocks upon which the light-house is built lie at the eastern angle of the shoal, and not over sixteen feet water will be found a quarter of a mile to the northeastward of them. There is no buoy either on the northeastern or northwestern end, but vessels may avoid the shoal by giving the light-house a berth of not less than half a mile to the southward. Bishop and Clerk's Light-house bears from Monomoy Point Light-house W. by N. $\frac{1}{4}$ N., eleven miles and a half distant.

There are several detached shoals, with from twelve to seventeen feet water upon them, to the southeastward of Senator Shoal, and extending nearly across the channel. They are not dangerous to vessels of twelve feet draught and less; but those of larger draught should keep about half a mile from Bishop and Clerk's Light-house in passing it,—thus hugging the southern side of the channel.

Dog Fish Bar and Kill Pond Bar, which have been described among the dangers in approaching the Roads from the eastward, are not in the way of vessels coming from the westward unless they are beating to windward. In such a case Dog Fish Bar may be avoided by not standing to the northward of the buoy on Senator Shoal bearing W SW., until you are about three miles to the eastward of it, when the rule is not to go to the westward of Bishop and Clerk's Light-house bearing SW. $\frac{3}{4}$ W. Kill Pond Bar may be avoided by not standing to the eastward of Monomoy Point Light-house bearing SE. $\frac{1}{4}$ E.

After passing the breakwater, the dangers are the same as those described in coming from the eastward.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING BASS RIVER ROADS.

II. *From the Westward, having come through the North Channel of Nantucket Sound.*—On the course E. by N. $\frac{3}{4}$ N. through the North Channel, when off Hyannis, in five and a quarter fathoms, with Bishop and Clerk's Light-house bearing SE. by S. $\frac{1}{4}$ S., Point Gammon Tower NE. by N. $\frac{3}{8}$ N., and Hyannis Light-house N. $\frac{1}{2}$ W., the course is SE. $\frac{1}{4}$ E. towards Handkerchief Light-vessel. On this course there will not be less than three and a quarter fathoms; and when Bishop and Clerk's Light-house bears W. by S. $\frac{1}{2}$ S., with four fathoms water, E. by N. $\frac{1}{2}$ N. should be steered, carrying not less than three fathoms, until Monomoy Point Light-house bears SE. by E. $\frac{3}{4}$ E., when the depth will be five fathoms and a N NE. course will lead you safely to the anchorage.

The above courses pass one hundred and fifty yards to the southward of Hallet's Rock; nearly half a mile to the northward of Bishop and Clerk's Light-house; and across the tail of the broken ground south of Senator Shoal in eighteen feet water. They pass three hundred and fifty yards to the eastward of the breakwater, and three hundred yards to the eastward of the black buoy on Dog Fish Bar.

Having come through the South or Main Channel of Nantucket Sound, to enter Bass River.
Roads.—On the course E. by S. $\frac{1}{4}$ S. from Cross Rip Light-vessel, when Handkerchief Light-vessel bears E. $\frac{3}{4}$ N. and Bishop and Clerk's Light-house N. $\frac{3}{8}$ E., the course is NE. $\frac{1}{4}$ E. for a little over a mile and a quarter, or until Cross Rip Light-vessel bears W. $\frac{1}{2}$ S. or Handkerchief Light-vessel E. $\frac{1}{2}$ N. The depth will be seven fathoms and the course NNE. This course continued will lead safely to the anchorage, where vessels may come to in from twelve to sixteen feet water. These courses pass nearly half a mile to the southward and four hundred yards to the eastward of the Broken Ground of the Horse-Shoe; after which there are no dangers.

Strangers should never attempt to enter Bass River,—its mouth being almost entirely closed at low water. It is, besides, so narrow and crooked as not to admit of navigation by the smallest vessels without a pilot.

The Roads are sometimes used in heavy northeasterly weather by coasters bound to the eastward, but the majority of vessels make Hyannis or Chatham Roads.

TIDES.

Corrected Establishment	12 ^h 17 ^m
Mean Rise and Fall of tides	3.7 ft.
Mean Rise and Fall of Spring tides	4.2 ft.
Mean Rise and Fall of Neap tides	2.7 ft.
Mean duration of Rise	6 ^h 46 ^m
Mean duration of Fall	5 ^h 35 ^m

CURRENTS.

The observations of tidal currents were made in the vicinity of Bishop and Clerk's Shoal, and, as far as practicable, in calm weather or light winds. The following table gives set and drift of the current,—the bearings being magnetic and the drift in nautical miles.

LOCALITY.	First Quarter.		Maximum.		Third Quarter.		Flood or Ebb.
	Set.	Drift.	Set.	Drift.	Set.	Drift.	
Half mile N. of Bishop and Clerk's Light-house.	E. $\frac{1}{4}$ S.	0.6	E.	0.5	E. $\frac{1}{4}$ N.	0.8	Flood Ebb.
	W. by N.	0.4	W. by N. $\frac{1}{4}$ N.	0.7	W. by N. $\frac{1}{4}$ N.	0.3	

VARIATION OF THE COMPASS.

The magnetic variation for 1880, off Point Gammon, is 11° 15' W., with an approximate annual increase of 2 $\frac{1}{2}$ '.

HYANNIS ROADS.

This anchorage, frequently resorted to by coasters during northeasterly gales, lies on the western side of Point Gammon and off the entrance to Lewis Bay. It is formed by a large cove embraced between Point Gammon on the east and Hyannis Point on the west; is two miles and a half wide at its entrance, and gradually contracts to about a mile in width at its head. The anchorage is partly sheltered from southerly winds by a breakwater,—a mass of stone loosely thrown together, and about four hundred yards long. Its direction is NW. by W. and SE. by E., and the eastern end was, in 1873, three-quarters of a mile SSW. from Hyannis Light-house. It is believed that it has not since been extended.

Point Gammon is a sandy bluff head, of moderate height, with yellow precipitous faces and level summit, crowned with a thick line of low trees. A white tower and dwelling on its southern end mark the site of the old light-house, which has been for some years discontinued. This point is shoal, and should not be approached from the eastward nearer than a mile and a half; or from the southward nearer than half a mile.

Hyannis Point, when viewed from the southward, appears as a smooth grassy hill, higher than any of the adjacent lands, and terminating to the northwestward in a high sandy bluff, joined to the point by a strip of low land. The summit and southern side of the point are covered with houses, forming part of the small settlement of Hyannis Port.

Over the low land to the eastward of Hyannis Port will be seen the village of Hyannis, which is situated a mile inland, and in range with it will appear the breakwater, which looks like a long line of rocks, the upper part having a whitish appearance. Nearly in range with the breakwater, and to the northward, will be seen Hyannis Light-house, situated close to the beach.

about half a mile E. by N. $\frac{1}{4}$ N. from Hyannis Port wharf and a mile and a half from Hyannis Point. It is a low white tower, standing close to the keeper's dwelling, on a smooth level point, with precipitous sandy faces. It is twenty-one feet high, and shows a fixed red light from a height of forty-two feet above the sea, visible twelve miles. Its geographical position is

Hyannis
Light-house.

Latitude ----- 41° 38' 9" N.
Longitude ----- 70° 17' 19" W.,

and there is no fog-signal.

At Hyannis Port there is a large railroad wharf, where vessels lie and discharge cargo.

DANGERS

IN APPROACHING AND ENTERING HYANNIS ROADS.

I. *From the Eastward.*—From Handkerchief Light-vessel the course for entering the North Channel of Nantucket Sound is NW. $\frac{1}{4}$ W., carrying not less than four and three-quarter fathoms. This will lead you up to Bishop and Clerk's Shoal, on the high, *Bishop & Clerk's Shoal.* dry rocks of which there is a tall grey light-house. This extensive shoal lies on the southern side of the North Channel, and has from four to twelve feet water upon it. It extends from the light-house in a NW. direction for one mile, and in a S. $\frac{1}{2}$ E. direction for seven-eighths of a mile, surrounding a group of dangerous rocks, which lie about two miles and three-eighths S. by E. from Point Gammon. On the northernmost of these rocks, twelve feet above high water, stands Bishop and Clerk's Light-house, a grey stone tower *Bishop & Clerk's Light-house.* forty-seven feet high, with a bell-tower of open work attached to its western side. It shows a white light, of the fourth order of Fresnel, (flashing once every thirty seconds,) from a height of fifty-nine feet above the sea, visible thirteen miles. Its geographical position is

Latitude ----- 41° 34' 25" N.
Longitude ----- 70° 15' 1" W.,

and it bears from

	Miles.
Point Gammon Tower, S. $\frac{1}{2}$ E. -----	2 $\frac{1}{4}$
Monomoy Point Light-house, W. by N. $\frac{3}{8}$ N. -----	11 $\frac{1}{2}$
Handkerchief Light-vessel, NW. $\frac{1}{4}$ W. -----	10 $\frac{1}{4}$
Nantucket Light-house, NW. by N. $\frac{3}{8}$ N. -----	14 $\frac{1}{4}$
Cross Rip Light-vessel, NE. by N. $\frac{3}{4}$ N. -----	7 $\frac{3}{4}$

The fog-bell is struck by machinery once every fifteen seconds, in foggy weather.

On the eastern side of the North Channel, opposite to Bishop and Clerk's Shoal, there are *several shoal spots*, with seventeen feet water, which form part of the extensive system of shoals making off to the southeastward from Point Gammon. The southernmost of these shoals lies two and one-eighth miles SE. by S. $\frac{3}{4}$ S. from Point Gammon Tower and three-quarters of a mile ENE. from Bishop and Clerk's Light-house,—the sailing-line passing midway between them. The other shoal spots lie in a line N. by W., towards Senator Shoal buoy. As, however, vessels drawing more than twelve feet rarely use Hyannis Roads as an anchorage, these shoals are not considered dangerous and are not buoyed.

When past Bishop and Clerk's Light-house, a spar-buoy, painted red and black in horizontal stripes, will be seen nearly ahead, but a little to the northward of the course, bearing about NW. This is on Hallet's Rock, a small detached ledge, with eight feet at mean low water, *Hallet's Rock.* lying nearly in the middle of the channel, and bearing from Bishop and Clerk's Light-house N. by W. $\frac{1}{4}$ W., one mile and an eighth, and from Point Gammon Tower S., one mile and a quarter distant. The buoy is placed in twenty feet water on its western side, and the sailing-line passes about an eighth of a mile to the southward of it. To avoid this rock at night, when in its vicinity, vessels should not stand farther to the northeastward than to bring Bishop and Clerk's Light-house to bear SSE. Easterly until Hyannis Light-house bears N. $\frac{3}{4}$ W., when they will be to the westward of the rock.

Senator Shoal lies on the northern side of the channel, forming one of the shoals extending from Point Gammon to the southward. It is not in the way of vessels bound into Hyannis *Senator Shoal.* from the eastward unless they attempt to cross the shoals. It is marked by a red spar-buoy (No. 8), placed in sixteen feet water on its southeastern end. Senator Shoal has seven feet at mean low water, with rocky bottom,—the shoal of the reef lying a mile SE. by S. from Point Gammon Tower and a mile and a half N. $\frac{3}{4}$ E. from Bishop and Clerk's Light-house.

When past Hallet's Rock, the next danger met with is marked by a red spar-buoy, which will be seen just to the eastward of Point Gammon and bearing about **NE. $\frac{1}{4}$ N.** This is on Gazelle Rock, also a part of the system of shoals making to the southward from Point Gammon.

Gazelle Rock. It has five feet at mean low water, lies **S. by E. $\frac{1}{2}$ E.** from Point Gammon Tower, half a mile, and **NW. $\frac{1}{4}$ W.** from the buoy on Senator Shoal, five-eighths of a mile distant. The buoy is marked No. 10 and placed in eighteen feet off the southern side of the rock, which is not, however, in the way of vessels from the eastward unless they are standing to the northward on a wind.

If beating to windward, a vessel should not stand farther to the westward than to bring Hyannis Light-house to bear **N. by E. $\frac{3}{4}$ E.**, and West-Southwest Ledge will be avoided,—a dangerous ledge, with eight feet at mean low water, lying near the eastern end of the extensive system of shoals extending to the southeastward from the Osterville shore.

West-Southwest Ledge. A first-class bell-buoy,* painted red and marked No. 14, is placed on the southeastern side of the ledge in sixteen feet water, and bears from Hyannis Light-house **SE. by S. $\frac{3}{4}$ S.**, two miles and three-quarters, and from Bishop and Clerk's Light-house **NW. by W.**, two miles and five-eighths distant. The shoalest spot on West-Southwest Ledge bears from

	Miles.
Hyannis Light-house, SW. by S. -----	nearly 3
Point Gammon Tower, W. by S. $\frac{3}{4}$ S. -----	2 $\frac{3}{8}$
Bishop and Clerk's Light-house, NW. by W. $\frac{1}{4}$ W. -----	3

This rock is also sometimes known as *Gangway Rock*, and from seventeen to eighteen feet water is found half a mile to the eastward of the bell-buoy; but with Hyannis Light-house bearing **N. by E. $\frac{1}{2}$ E.** there will not be less than twenty feet.

The course continues to the northwestward for a mile and three-eighths after passing Hallet's Rock, and there will be seen a little to the westward of the course, and about a mile to the northeastward of the bell-buoy on West-Southwest Ledge, a black spar-buoy.

The Southwest Ground. This is on The Southwest Ground, the southern extremity of the shoals which make off from Hyannis Point, and has from seven to twelve feet water upon it. The buoy is placed off its eastern end in three fathoms, is marked No. 1, and bears from

	Miles.
Hyannis Light-house (in range with the eastern end of the breakwater), SSW. -----	2
Point Gammon Tower, W. $\frac{3}{4}$ S. -----	1 $\frac{1}{2}$
The bell-buoy on West-Southwest Ledge, NE. $\frac{1}{4}$ E. -----	nearly 1

The course passes to the eastward of the buoy on The Southwest Ground and turns to the northward toward Hyannis Light-house. On this course you must look out, on the eastern side of the channel, for Gardiner's Rock, which will be recognized by the red spar-buoy (No. 2) on its southwestern end. This is a detached rock, with ten feet at mean low water, which forms part of the shoal ground making off from the entrance to Lewis Bay, and is three-quarters of a mile from the western shore of Point Gammon. Gardiner's Rock bears from Hyannis Light-house **S. $\frac{1}{4}$ W.**, one mile and an eighth, and from Point Gammon Tower **NW. by W.**, nearly one mile distant. The buoy is placed on its southwestern side, in fourteen feet water, and bears from the black buoy (No 1) on The Southwest Ground **NE. $\frac{1}{2}$ N.**, one mile distant. The sailing-line passes to the westward of it.

About two hundred and fifty yards to the northward of Gardiner's Rock buoy will be seen an iron spindle with a cage on top, also on the eastern side of the channel. This is on Great Rock, a dry ledge on the western extremity of the flats making off from the western side of Point Gammon. It is about eight feet above high water, lies nearly three-quarters of a mile from the shore, (marking the eastern limits of the channel,) and bears from Point Gammon Tower **NW. by W.**, one mile, and from Hyannis Light-house **S. $\frac{1}{4}$ W.**, one mile and an eighth distant.

It must also be remarked that about a quarter of a mile **SE.** from Great Rock, and four hundred yards inshore of Gardiner's Rock, there is a detached ledge, dry at half ebb, and called *Half-Tide Rock*. It is not buoyed, but is easily avoided by not standing to the eastward of the buoy on Gardiner's Rock.

Above Great Rock there are no buoys,—the limits of the channel being marked, on the west by the breakwater, which is half a mile to the northwestward of Great Rock spindle; and on the eastern side by the flats, which may be easily avoided by a judicious use of the lead. On the eastern end of the breakwater there is a wooden spindle with four arms, surmounted by a cask, and painted black and white; and abreast of this the channel is only about three hundred yards wide; but at the anchorage above the breakwater it has a width of between six and seven hundred yards and a depth of from thirteen to nineteen feet at mean low water, with muddy bottom.



Spreads on
Endpapers

Plains, Alaska on
S. 25. 6000 1000

Western Entrance to Hyannis Roadstead, Pt. Caution, Tower bearing N. E. + E. distant 14 Miles.

P. Caution
Tower

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING HYANNIS ROADS.

I. From the Eastward.—From Handkerchief Light-vessel the course is **NW. $\frac{1}{4}$ W.** through the North Channel of Nantucket Sound, carrying not less than three and a quarter fathoms, until Hyannis Light-house bears **N. by E. $\frac{1}{4}$ E.**, when the black spar-buoy on The Southwest Ground will be three-eighths of a mile distant, bearing about **W. $\frac{3}{4}$ N.** The depth will be four fathoms, and the course thence is **N. by E. $\frac{1}{4}$ E.** for the light-house, carrying not less than sixteen feet, until past the breakwater,—to the northward of which good anchorage will be found in from two to three fathoms, muddy bottom.

The above courses pass a quarter of a mile to the westward of the southernmost of the shoal spots S. of Senator Shoal; three-eighths of a mile to the eastward of Bishop and Clerk's Light-house; three-quarters of a mile to the westward of Senator Shoal; one hundred and fifty yards to the westward of Hallet's Rock; three-quarters of a mile to the westward of Gazelle Rock; seven-eighths of a mile to the eastward of the bell-buoy on West-Southwest Ledge; three-eighths of a mile to the eastward of the black buoy on The Southwest Ground; two hundred yards to the westward of the red buoy on Gardiner's Rock; eight hundred yards to the westward of Half-Tide Rock; three hundred yards to the westward of the spindle on Great Rock; two hundred yards to the eastward of the eastern end of the breakwater; and one hundred yards to the westward of the flats off Lewis Bay.

Or, having come through the Main or South Channel of Nantucket Sound, to enter Hyannis Roads.—When, on the course **W. by N. $\frac{1}{4}$ N.** towards Cross Rip Light-vessel, Handkerchief Light-vessel bears **N. $\frac{1}{4}$ E.** and Nantucket Light-house **S. $\frac{3}{4}$ W.**, the depth will be seven fathoms, and the course **NW. by N.**, carrying not less than five fathoms, until Bishop and Clerk's Light-house bears **W. by N. $\frac{1}{4}$ N.**, nearly one mile distant; when **NW. $\frac{1}{4}$ N.** will lead through the North Channel, following the directions given above.

DANGERS

IN APPROACHING AND ENTERING HYANNIS ROADS.

II. From the Westward.—On the course **E. by N. $\frac{3}{4}$ N.** from abreast of Eldridge's Shoal, when past the buoy on the northwestern end of the Horse-Shoe it will be necessary to look out, on the northern side of the channel, for a detached shoal with ten feet at mean low water,—the southernmost of a line of shoals lying off the entrance to Osterville Harbor. It has no name and is not buoyed, but is easily avoided by not going to the northward of Succonesset Shoal Light-vessel bearing **W. by S. $\frac{1}{4}$ S.** When past this shoal there are no dangers in the channel; but, if beating to windward, vessels should not stand farther to the northward than to bring Bishop and Clerk's Light-house to bear **E SE.** to avoid the ledges off Centreville. Of these, the westernmost and first met with is known as Collier's Ledge, a half-tide rock, marked by a granite beacon, surmounted **Collier's Ledge.** by a black spindle, with ball and vane on top. It bears from Bishop and Clerk's Light-house **NW. by W. $\frac{1}{2}$ W.**, four miles and three-quarters, and from Succonesset Light-vessel **NE.** by **E.**, five miles and a quarter distant. From this beacon the bell-buoy on West-Southwest Ledge bears **SE. by E. $\frac{1}{4}$ E.**, distant two miles. With a fair wind, however, vessels pass so far to the southward of the beacon as not even to see it.

Three-quarters of a mile **E. by S. $\frac{1}{2}$ S.** from Collier's Ledge lies another detached rock, with five feet at mean low water, called Gallatin Rock. A spar-buoy, painted black and marked **Gallatin Rock.** No. 1, is placed in thirteen feet on the western side of the rock, and bears from Bishop and Clerk's Light-house **NW. by W. $\frac{1}{4}$ W.**, distant four miles. Seven-eighths of a mile **SE. by E. $\frac{1}{4}$ E.** from it, and nearly in range with Bishop and Clerk's Light-house, lies **Hodges' Rock,** with five and a half feet at mean low water, and marked by a spar-buoy painted red and black in horizontal stripes. This buoy is placed on the western side of the rock in three fathoms water, and bears from

	Miles.
Hyannis Light-house, SW. $\frac{3}{4}$ S.-----	3
Bishop and Clerk's Light-house, NW. by W. $\frac{1}{2}$ W.-----	3 $\frac{1}{2}$
The bell-buoy on West-Southwest Ledge, W. by N. $\frac{1}{4}$ N.-----	3 $\frac{1}{2}$

West-Southwest Ledge, the most southeasterly of the detached ledges off Centreville, was formerly called **Gangway Rock,** and has eight feet at mean low water. A first-class bell-buoy, * painted red and marked No. 14, is placed on its southeastern side in seventeen feet water, and bears from Hyannis Light-house **SE. by S. $\frac{3}{4}$ S.**, two miles and three-quarters, and from Bishop and Clerk's Light-house **NW. by W.**, two miles and five-eighths distant. The sailing-line passes from one-third to half a mile to the southward of it.

When up with West-Southwest Ledge a red and black horizontally-striped buoy will be seen on the southern side of the channel and about three-quarters of a mile off. This is on The Middle Ground, or *Hyannis Middle Ground*, as it is often called, a large shoal with from twelve to seventeen feet at mean low water, which extends in a **NW. $\frac{1}{2}$ W.** and **SE. $\frac{1}{2}$ E.** direction for about a mile and an eighth. The twelve-foot spot on the shoal bears from Bishop and Clerk's Light-house **W. by N.**, one mile and a half, and from Hyannis Light-house **S. $\frac{3}{4}$ W.**, three miles and five-eighths distant. The buoy is placed to the northward of the shoalest part, and bears from Hyannis Light-house **S. by W. $\frac{1}{4}$ W.**, three miles and three-eighths, and from the bell-buoy on West-Southwest Ledge **SE. by S. $\frac{1}{4}$ S.**, nearly one mile distant. The sailing-line passes half a mile to the northward of the buoy.

When past West Southwest Ledge buoy the course turns to the northward towards Hyannis Light-house, and a black spar-buoy (No. 1) will soon become visible a little to the westward of the course, bearing about **N. $\frac{3}{4}$ W.**, and three-quarters of a mile off. This is on The Southwest Ground, the southern extremity of the shoals making off from Hyannis Point. The shoal has from seven to twelve feet water upon it, and the buoy is placed upon its eastern end, bearing as follows: From

	Miles.
Hyannis Light-house (in range with the spindle on the eastern end of the breakwater), S SW. -----	2
Point Gammon Tower, W. $\frac{3}{4}$ S. -----	1 $\frac{1}{2}$
The bell-buoy on West-Southwest Ledge, NE. $\frac{1}{4}$ E. -----	nearly 1

When past the buoy on The Southwest Ground, look out on the eastern side of the channel for Gardiner's Rock, which will be recognized by the red spar-buoy (No. 2) on its southwestern end. This is a detached rock, with ten feet at mean low water, forming part of the shoal ground making off from the entrance to Lewis Bay, and is three-quarters of a mile from the western shore of Point Gammon. It bears from Hyannis Light-house **S. $\frac{1}{4}$ W.**, one mile and an eighth, and from Point Gammon Tower **NW. by W.**, nearly one mile distant. The buoy is placed in fourteen feet water, and bears from the black buoy on The Southwest Ground **NE. $\frac{1}{2}$ N.**, one mile distant. The sailing-line passes to the westward of it.

About two hundred and fifty yards to the northward of Gardiner's Rock buoy will be seen an iron spindle with cage on top, also on the eastern side of the channel. This is on Great Rock, a dry ledge on the western extremity of the flats making off from the western side of Point Gammon. It is nearly three-quarters of a mile from the shore, marks the eastern limits of the channel, and bears from Point Gammon Tower **NW. by W.**, one mile, and from Hyannis Light-house **S. $\frac{1}{2}$ W.**, a mile and an eighth distant.

It must also be remarked that about a quarter of a mile **SE.** from Great Rock, and four hundred yards inshore of Gardiner's Rock, there is a detached ledge, dry at half ebb, called *Half-Tide Rock*. It is not buoyed, but is easily avoided by not attempting to pass to the eastward of Gardiner's Rock buoy.

Above Great Rock there are no buoys,—the limits of the channel being marked on the east by the flats, which may be easily avoided by a judicious use of the lead; and on the west by the breakwater, which has on its eastern end a wooden spindle with four arms, surmounted by a cask, and painted black and white. Abreast of the breakwater the channel is only about three hundred yards wide, but to the northward of it, at the anchorage, it has a width of between six and seven hundred yards and a depth of from thirteen to nineteen feet at mean low water, muddy bottom.

In the middle of the channel, and just inside the breakwater, the wreck of a schooner was reported under date of July 12, 1878, with her masts and bowsprit out of water. The wreck bore from the spindle on the eastern end of the breakwater **NE. $\frac{3}{4}$ N.**, distant a quarter of a mile. No information as to the removal of this wreck has reached the Coast Survey Office up to this date, August, 1880.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING HYANNIS ROADS.

II. From the Westward.—When to the eastward of Succonesset Shoal Light-vessel, it is customary for vessels bound to the eastward, through the North Channel of Nantucket Sound, to bring the light-vessel to bear **W. by N. $\frac{3}{4}$ N.**, one mile distant, and steer **E. by N. $\frac{3}{4}$ N.**, carrying not less than three and a half fathoms, until past the bell-buoy on West-Southwest Ledge and Hyannis Light-house bears **N. by E. $\frac{1}{4}$ E.** The depth will be three and a half fathoms, and vessels must steer for the light-house, following the directions previously given. (See page 137.)

The above courses pass seven hundred yards to the southward of the ten-foot shoal off Osterville three-eighths of a mile to the southward of the bell-buoy on West-Southwest Ledge; nearly half

mile to the northward of the buoy on The Middle Ground, and three hundred yards to the northward of the shoal water surrounding it; three-eighths of a mile to the eastward of the black buoy off The Southwest Ground; eight hundred yards to the westward of Half-Tide Rock; two hundred yards to the westward of the red buoy on Gardiner's Rock; three hundred yards to the westward of the spindle on Great Rock; and two hundred yards to the eastward of the eastern end of the breakwater.

GENERAL REMARKS

FOR VESSELS APPROACHING HYANNIS ROADS.

Striking ten and eleven fathoms is a sure indication of being to the northward of the Horse-Shoe; and it would be well for strangers in beating through the North Channel, in its vicinity, and in thick weather, not to approach the Horse-Shoe nearer than ten fathoms in case Succoneset Light-vessel cannot be seen.

In working up to the Roads, when abreast of The Southwest Ground it is not safe to approach either shore nearer than a depth of two and a half fathoms. When to the northward of Great Rock, the eastern mark is Hyannis Light-house on with the western spire in the village. When to the northward of The Southwest Ground, the western mark is the western end of the breakwater on with Hyannis Light-house.

LIGHT-HOUSES.

NAME.	Latitude.	Longitude West.			Fixed or Revolving.	Interval of Flash.	Height above sea-level.	Distance visible in nautical miles.
		In arc.		In time.				
	° ' "	° ' "	h. m. s.		m. s.	Feet.		
Hyannis Light-house	41 38 9	70 17 19	4 41 9	Fixed red.	.....	42	12
Bishop and Clerk's Light-house.	41 34 25	70 15 1	4 41 0	Revolving.	0 30	59	13	

TIDES.

Corrected Establishment	12 ^h 3 ^m
Mean Rise and Fall of tides	3.8 ft.
Mean Rise and Fall of Spring tides	4.0 ft.
Mean Rise and Fall of Neap tides	3.1 ft.
Mean duration of Rise	6 ^h 26 ^m
Mean duration of Fall	5 ^h 55 ^m
Rise of highest tide observed	5.3 ft.

CURRENTS.

No.	Locality.	First Quarter, Set.	Second Quarter, Set.	Third Quarter, Set.	Fourth Quarter, Set.	Flood or Ebb.
1	Two-thirds of a mile N. by E. $\frac{1}{2}$ E. from Bishop and Clerk's Light-house.	E. $\frac{1}{2}$ S. W. by N. $\frac{1}{2}$ N.	E. W. by N. $\frac{1}{2}$ N.	E. $\frac{1}{2}$ S. W. by N. $\frac{1}{2}$ N.	E. $\frac{1}{2}$ N. W. NW.	Flood. Ebb.
2	Eastern end of The Middle Ground	SE. by E. $\frac{1}{2}$ E. NW. by W. $\frac{1}{2}$ W.	E. by S. W. $\frac{1}{2}$ N.	E. $\frac{1}{2}$ S. W. by S.	E. $\frac{1}{2}$ S. W. NW.	Flood. Ebb.
3	Mid-channel, between Point Gammon and The Southwest Ground	S. by E. $\frac{1}{2}$ E. NW. by W.	SE. by E. NW. by W. $\frac{1}{2}$ W.	E. by N. NW. by W. $\frac{1}{2}$ W.	NE. by E. $\frac{1}{2}$ E. W. by N. $\frac{1}{2}$ N.	Flood. Ebb.

The above observations were made when there was little or no wind. The set is given in magnetic bearings, but the drift was not observed.

VARIATION OF THE COMPASS.

The magnetic variation for 1860 is 11° 20' W., with an annual increase of 2 $\frac{1}{2}$ '.

CENTREVILLE HARBOR.

On the western side of Hyannis Point a large semi-circular cove makes in to the northward, with from two to three fathoms in it at low water. It is known as Centreville Harbor, and its entrance is easily recognized, when seen from the southward, by the high, blue, wooded hills in the background, in front of which stretches low flat land faced by a white sand beach. Between the beach and the hills the tall steeple and thickly clustered houses of Centreville will appear; and, when sufficiently near, the stone pyramid on Collier's Ledge may be seen. The harbor of Centreville is, properly speaking, only a roadstead,—being open

to southerly winds, the sea from which is but partially broken off by the shoals at the entrance. It has fair holding-ground, but is rarely used, except when vessels cannot make Hyannis or Chatham roads. The shores of the harbor are low and sandy, dotted with sand hillocks and backed by thick woods.

There are two channels leading to the anchorage, having equally good water, and known respectively as the East and West channels. Strangers, however, should never attempt either unless compelled to do so by absolute necessity, as they are narrow and full of shoals, and not more than ten feet at low water is found in either.

DANGERS

IN APPROACHING AND ENTERING CENTREVILLE HARBOR.

I. *From the Eastward.*—Making an anchorage in this roadstead presupposes having come through the North Channel of Nantucket Sound; and it is hardly ever entered from the eastward,—being so near to Hyannis Roads. Wishing to enter from this direction, however, the course leads between the bell-buoy on West-Southwest Ledge on the north, and the horizontally-striped buoy on Hyannis Middle Ground on the south; and, when about three-quarters of a mile to the southwestward of the bell-buoy, turns abruptly to the northwestward; when there will be seen a little to the northward of the course, and about three-quarters of a mile off, a spar-buoy painted red and black in horizontal stripes. This is on Hodges' Rock, a detached ledge, with five and a half feet at mean low water, which lies a quarter of a mile to the westward of West-Southwest Ledge and on the eastern side of the entrance to Centreville. The buoy is placed on the western side of the rock in three fathoms water, and bears from

	Miles.
Hyannis Light-house, SW. $\frac{3}{4}$ S. -----	3
Bishop and Clerk's Light-house, NW. by W. $\frac{1}{2}$ W. -----	3 $\frac{1}{4}$
The bell-buoy on West-Southwest Ledge, W. by N. $\frac{1}{4}$ N. -----	3 $\frac{3}{8}$

When abreast of it, it will be necessary to look out, on the western side of the channel, for Gallatin Rock, a small rock, with five feet at mean low water, which lies nearly one mile to the northwestward of Hodges' Rock, and is marked by a black spar-buoy (No. 1) placed in thirteen feet off its western side. This buoy bears from Bishop and Clerk's Light-house NW. by W. $\frac{1}{2}$ W., four miles, and from the buoy on Hodges' Rock NW. by W. $\frac{1}{4}$ W., nearly seven-eighths of a mile distant. When past it, and continuing the course to the northward, the sailing-line leads to the westward of two spar-buoys,—the one nearest to the course being horizontally striped black and red, and the other a red buoy. The latter marks Bearse's Rock, and the red and black buoy Channel Rock.

Bearse's Rock is a detached rock, with five feet at mean low water, which lies nearly a mile NNW. from Hodges' Rock, and bears from Hyannis Light-house SW. $\frac{3}{4}$ W., two miles and three-quarters distant. The buoy is placed in twelve feet on the western side of the rock, and is marked No. 2. The sailing-line passes a quarter of a mile to the westward of it. Channel Rock, which is marked by the red and black buoy, is a small detached rock with six feet at mean low water, and is distant from Bearse's Rock about six hundred yards in a WNW. direction. The buoy is placed close to it in twelve feet water, and bears from

	Miles.
Centreville spire, S. -----	2 $\frac{1}{2}$
Hyannis Light-house, SW. by W. $\frac{1}{4}$ W. Nearly -----	3
Hyannis Point, SW. $\frac{1}{4}$ S. -----	1 $\frac{3}{8}$
The black buoy on Gallatin Rock, N. by E. -----	1 $\frac{1}{2}$

The course passes to the eastward of this buoy and close-to.

When past the buoy on Channel Rock, the next danger lies on the western side of the channel, and is called Middle Ledge, or, sometimes, *The Middle Ground*. It is a detached rock, lying off the eastern end of Deadneck Shoal, and has six feet upon it at mean low water. A red spar-buoy (No. 2) is placed on its southern side; notwithstanding which better water is found by passing to the eastward of it, as if it were a black buoy. This shoal is not in the way of vessels coming in by the East Channel unless they are standing to the westward on a wind, in which case, to avoid it, they should not go to the westward of Centreville spire bearing N. by E. The buoy is in nine feet water and bears from

	Miles.
The red buoy on Bearse's Rock, NW. by W. -----	1
Hyannis Light-house, W. by S. $\frac{3}{4}$ S. -----	3 $\frac{1}{4}$
Hyannis Point, WSW. Nearly -----	1 $\frac{3}{8}$

Only four hundred yards to the northward of this buoy will be seen a black spar-buoy. This is on Deadneck Rock, a small detached rock, with six feet at low tide, lying off the eastern end of *Deadneck Shoal*, (which is that extensive piece of shoal ground stretching *Deadneck Rock* along the northern shore from Deadneck Point—the western point of entrance to Centreville—to Osterville Entrance.) The buoy, which is marked No. 1, and placed close to it on its eastern side, marks the junction of the East and West channels,—the sailing-lines of both uniting about an eighth of a mile to the eastward of it.

A little to the northward of Deadneck Rock buoy, but on the eastern side of the channel, will be seen a red spar-buoy, which is on Gurnet Rock, or *Gurnet Ledge*, as it is sometimes called. This rock, which is bare at low water, lies near the western end of the shoals *Gurnet Rock* which make off from Hyannis Point. The buoy is marked No. 4, is placed in two fathoms water, and bears from Hyannis Point **W. by S. $\frac{1}{4}$ S.**, three-quarters of a mile, and from Bearse's Rock buoy **N. $\frac{3}{4}$ W.**, one mile distant. The sailing-line passes well to the westward of it.

When abreast of the buoy on Gurnet Rock another red spar-buoy will be seen to the northward,—being about three-quarters of a mile distant in a **N. by E.** direction. This is on Spindle Rock, a detached rock or boulder, lying on the flats on the eastern side of the harbor, and a quarter of a mile from the northern shore. It is dry at low water, and was formerly marked by a spindle, which is now replaced by the buoy (No. 6) placed in two fathoms on its southwestern side. Anchorage is found in three and a quarter fathoms to the southwestward of this buoy, or in from twelve to sixteen feet to the northward of it, and close under the northern shore of the harbor.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING CENTREVILLE HARBOR.

I. *From the Eastward.*—On the course **W. by S. $\frac{3}{4}$ S.** from off Point Gammon, when the bell-buoy on West-Southwest Ledge has been passed, and Hyannis Light-house bears **NE. by N. $\frac{1}{2}$ N.**, three miles and five-eighths distant, the depth will be three fathoms and three-quarters, and the course **NNW.** for two miles and a half, carrying not less than ten feet at low water, until abreast of Deadneck Rock buoy. Thence **N. by E. $\frac{1}{4}$ E.** for half a mile will lead to the anchorage in three and a quarter fathoms, sticky bottom, with Hyannis Point bearing **E. $\frac{1}{2}$ S.** Or, **E. by N. $\frac{1}{4}$ N.** may be steered, from the above bearing of Hyannis Point, for from half to three-quarters of a mile, where anchorage in from sixteen to eighteen feet may be found, with sticky bottom, and tolerably well sheltered from southerly winds.

The above courses pass six hundred and fifty yards to the westward of the red and black buoy on Hodges' Rock; a little over four hundred yards to the eastward of the black buoy on Gallatin Rock; a quarter of a mile to the westward of Bearse's Rock; a little over one hundred yards to the westward of Channel Rock; three hundred yards to the eastward of Deadneck Rock; eight hundred and fifty yards to the westward, and three-eighths of a mile to the northward, of Gurnet Rock; and six hundred yards to the southward of Spindle Rock.

DANGERS

IN APPROACHING AND ENTERING CENTREVILLE HARBOR.

II. *From the Westward.*—Vessels bound to the eastward through the North Channel of Nantucket Sound, and wishing to make an anchorage in Centreville Harbor, are accustomed, when on the **E. by N. $\frac{1}{4}$ N.** course Hyannis Light-house bears **NE. $\frac{1}{4}$ N.** and Bishop *Collier's Ledge* and Clerk's Light-house **E. $\frac{1}{4}$ S.**, to steer **N. by E. $\frac{1}{4}$ E.** On this course there will soon be seen a pyramidal stone beacon, surmounted by a black spindle, with ball and vane on top, and showing a little to the westward of the course. This is on Collier's Ledge,—a half-tide rock,—the westernmost of the dangerous ledges off Centreville, and bears from

	Miles.
Bishop and Clerk's Light-house, NW. by W. $\frac{1}{2}$ W. -----	4 $\frac{3}{4}$
Hyannis Light-house, SW. by W. $\frac{1}{2}$ W. -----	nearly 3 $\frac{3}{4}$
The bell-buoy on West-Southwest Ledge, W NW. -----	2

The sailing-line passes to the eastward of it; while on the eastern side of the channel, but over half a mile off, will be seen the black spar-buoy on *Gallatin Rock*, which lies between the East and West channels, but is not in the way of vessels using the West Channel unless they are standing to the eastward on a wind.

When past Collier's Ledge the red and black spar-buoy on Channel Rock will be seen about N. by E. from the black buoy on Gallatin Rock, and distant nearly half a mile. Channel Rock is a small detached rock, with six feet at low water, lying on the eastern side of this channel. The buoy is placed in two fathoms close to it. It bears from

	Miles.
Centreville spire, S.-----	2 $\frac{1}{2}$
Hyannis Light-house, SW. by W. $\frac{1}{4}$ W.-----nearly	3
Hyannis Point, SW. $\frac{1}{4}$ S.-----	1 $\frac{3}{4}$
The black buoy on Gallatin Rock, N. by E.-----	1 $\frac{1}{2}$

The sailing-line passes well to the westward of the buoy on Channel Rock, and next to the northward will be seen the red spar-buoy on Middle Ledge, (sometimes called *The Middle Ground*.) another detached rock, with six feet at low water, which lies off the eastern end of Deadneck Shoal. The buoy is marked No. 2, placed close to the ledge, in nine feet water, and bears from Hyannis Point W SW., one mile and five-eighths, and from Hyannis Light-house W. by S. $\frac{3}{4}$ S., three miles and a quarter distant. Only four hundred yards to the northward of it will be seen the black spar-buoy on Deadneck Rock, a small detached rock, lying off the eastern end of Deadneck Shoal, with six feet at low water upon it. The buoy, which is marked No. 1, is placed close to it on its eastern side, and serves as a guide to keep vessels off the shoal also. The sailing-line passes a little over two hundred yards to the eastward of it.

A little to the northward of Deadneck Rock buoy, but on the eastern side of the channel, will be seen a red spar-buoy. This is on Gurnet Rock, or *Gurnet Ledge*, as it is sometimes called, which is bare at low water, and lies near the western end of the shoals making off from Hyannis Point. The buoy is marked No. 4, placed in two fathoms water on the southwestern side of the rock, and bears from Hyannis Point W. by S. $\frac{1}{4}$ S., three-quarters of a mile distant. The sailing-line passes well to the westward of it; and when abreast of it another red spar-buoy will be seen in a N. by E. direction, and about three-quarters of a mile off. This is on Spindle Rock, a detached rock or boulder lying on the flats on the eastern side of the harbor, and about a quarter of a mile from the northern shore. It is dry at low water, and was formerly marked by a spindle, which is now replaced by a spar-buoy (No. 6) placed in twelve feet water on its southwestern side. Anchorage is found in three and a quarter fathoms to the southwestward of this buoy; in sixteen to eighteen feet to the southward of it; and in from twelve to sixteen feet to the northward of it, close under the northern shore of the harbor.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING CENTREVILLE HARBOR.

II. *From the Westward*.—When past the black buoy on the northern end of Eldridge's Shoal the course is E. by N. $\frac{3}{4}$ N., through the North Channel of Nantucket Sound. On this course, wishing to enter Centreville Harbor, when Bishop and Clerk's Light-house bears E. $\frac{1}{4}$ S., four miles and five-eighths distant, and Hyannis Light-house NE. $\frac{1}{4}$ N., five miles and one-eighth distant, the depth will be five and three-quarter fathoms, and the course N. by E. $\frac{1}{4}$ E. will lead safely through the West Channel with not less than ten feet water. Anchorage will be found on this course anywhere to the northward of Gurnet Rock buoy. Or, when Hyannis Point bears E. $\frac{1}{2}$ S., the course E. by N. $\frac{1}{4}$ N. will lead to a safe anchorage under the western shore of that point, tolerably well sheltered from southerly winds.

The above courses pass four hundred yards to the eastward of the beacon on Collier's Ledge; half a mile to the westward of Gallatin Rock; the same distance to the westward of Channel Rock; four hundred yards to the eastward of Middle Ledge; two hundred yards to the eastward of the black buoy on Deadneck Rock; eight hundred and fifty yards to the westward, and three-eighths of a mile to the northward, of the red buoy on Gurnet Rock; and a little over a quarter of a mile to the southward of Spindle Rock.

GENERAL REMARKS

FOR VESSELS BOUND TO THE WESTWARD.

Vessels of light draught bound to the westward from Hyannis usually bring Point Gammon Tower to bear E. by N., and steer W. by S. until Bishop and Clerk's Light-house bears E SE. This course crosses the shoals in sixteen feet water to the southward of The Southwest Ground, and to the northward of West-Southwest Ledge and Hodges' Rock. Thence the course is W. by S. $\frac{3}{4}$ S., carrying

not less than four fathoms, passing to the northward of Wreck Shoal and to the southward of the red buoy on the eastern end of Succoisset Shoal. When Succoisset Light-vessel bears E. Southerly, a little over a mile distant, with five fathoms, "hard sand," the course is E. $\frac{3}{4}$ S., passing to the northward of L'Homme Dieu Shoal in not less than five fathoms water.

Tides in this vicinity rise about five feet. The Current begins to run to the westward at half-flood, and continues so running until half-ebb. It then runs to the eastward until half-flood again, with a velocity of about two and a half knots an hour.

OSTERVILLE HARBOR.

the entrance to which lies a little over three miles to the westward of Centreville Entrance, is a long inlet of irregular shape, crooked, shallow, and of little importance. The shore between the two entrances is low, sandy, faced by a beach and backed by thick woods, and there are a few houses scattered along its length. Osterville inlet is about fourteen hundred yards wide at its mouth; but the available width is much diminished by a low sandy islet, nearly half a mile long, called Sampson's Island, which lies in a NE. and SW. direction across the mouth of the inlet. To the west- Sampson's Island. ward of this lies another low sandy islet, extending E. and W. for about seven hundred yards,—leaving a passage a quarter of a mile wide between the two. The inlet runs first N NE. for one mile to Cotuit Port, which occupies its western bank; then turns about NE. by E. for another mile; and then spreads out into a wide shallow bay, about a mile and a half long, which runs in a southerly direction to within one hundred and fifty yards of the outside beach. It is nearly separated from Osterville Harbor by Osterville Grand Island,—a sandy islet a mile and a quarter long, irregular in shape, with steep sandy faces, and thickly wooded. A very narrow passage leads into the bay at each end of the island.

The village of Osterville occupies nearly all of the eastern shore of the bay, and extends across to the western shore of Centreville inlet,—so that it has two wharf fronts.

The western shore of Osterville inlet, from the entrance to Cotuit Port, is composed of level lands, cleared, cultivated, and thickly settled, and backed by woods. Above Cotuit Port the wooded and cleared shores are about equally divided. The eastern shore of the inlet is formed by the wooded lands of Osterville Grand Island.

The harbor cannot be entered by strangers, and is rarely entered by any vessel. Large flats, in many places dry at low water, extend across the mouth of the inlet; and although these are buoyed, it is only for the convenience of the small craft which belong there. It may, however, be remarked that there is, a little to the eastward The Deep Hole. of the entrance, a sort of pocket in the flats, which runs about N. and S., with not less than seven feet at low water, to within one hundred and fifty yards of the beach. This pocket is called The Deep Hole, and good anchorage is found in it in from seven to fifteen feet water, soft bottom; but it is not recommended to strangers.

DANGERS

IN APPROACHING AND ENTERING OSTERVILLE HARBOR.

The entrance to The Deep Hole is marked by a second class can-buoy,* painted red and black in horizontal stripes, with a bell secured on top in an iron frame, which is again sur- Lone Rock. mounted by a hoop-iron day-mark. This buoy is on Lone Rock, sometimes called Deep Hole Rock, a small detached rock, with four feet at low water, which lies off the mouth of The Deep Hole, and bears from

	Miles.
The bell-buoy on West-Southwest Ledge, W. $\frac{3}{4}$ N.-----	4 $\frac{1}{2}$
The spindle on Collier's Ledge, W. $\frac{1}{4}$ S.-----	2 $\frac{1}{2}$
Succoisset Light-vessel, NE. $\frac{3}{4}$ N.-----	3 $\frac{3}{4}$
The red buoy on the eastern end of Succoisset Shoal, NE. $\frac{1}{4}$ N., a little over	3

The buoy is placed in fifteen feet, hard bottom, near the southern end of the rock, and may be passed on either hand by giving it a berth; but it is usual to pass to the southward of it. There is tolerable anchorage north, east, and west of the rock, in from thirteen to sixteen feet water, but it is rarely used.

Three-eighths of a mile NE. by E. from the bell-buoy on Lone Rock will be seen a red spar-buoy, marked No. 2. This is on the southwestern extremity of Deadneck Shoal, the name given to that extensive area of flats making off from the mainland between Deadneck Shoal. Centreville and Osterville harbors. The buoy is placed in eight feet water seven-eighths of a mile from shore, and the channel passes between it and Lone Rock buoy.

Seven-eighths of a mile W. $\frac{1}{2}$ N. from Deadneck Shoal buoy, and three-eighths of a mile NW. from Lone Rock buoy, will be seen a black spar-buoy, marked No. 1. This is on the eastern extremity of Cotuit Flats, which have from one to five feet upon them, and Cotuit Flats. extend off to the eastward from the Poponisset and Cotuit shores, completely closing the entrance to Osterville. The buoy is placed in eight feet water, and the channel passes about mid-way between it and the buoy on the southern end of Deadneck Shoal.

When abreast of the black buoy on Cotuit Flats, a red spar-buoy will appear nearly ahead and about half a mile off. This is also on Deadneck Shoal, but is placed on its extreme western end, about half a mile from shore. The buoy, which is marked No. 4, is in eight feet water on the eastern side of the channel, and bears from

	Mile.
The red buoy on the southwestern end of the shoal, NW. -----	3 4
Lone Rock buoy, N. by W. -----	3 4
Cotuit Flats buoy, N. by E. $\frac{1}{8}$ E. -----	1 2

This is the last buoy met with in the channel.

The Deep Hole is also sometimes called Cotuit Outer Harbor.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING OSTERVILLE HARBOR.

I. To enter The Deep Hole from the Eastward.—When past the bell-buoy on West-Southwest Ledge, and in three and a half fathoms, with Bishop and Clerk's Light-house bearing **E SE.** and Hyannis Light-house **NE. by N.**, steer **W. by N. $\frac{1}{4}$ N.**, carrying not less than three and a half fathoms; and as soon as the bell-buoy on Lone Rock is seen, steer so as to pass about three hundred and fifty yards to the northward of it; and when it bears **S.**, anchor in fifteen and a half feet, hard bottom; or, steer **N NW.** Westerly for the eastern point of entrance to Osterville, anchoring in from seven to nine feet, according to draught.

II. To enter The Deep Hole from the Westward.—The course is **NE. $\frac{3}{4}$ N.** from Suceonesset Light-vessel until the bell-buoy on Lone Rock is seen, which should be made directly ahead. On this course there will not be less than sixteen feet water until within three-quarters of a mile of the buoy; when the course should be altered to the eastward so as to pass about two hundred yards outside of it. The buoy should be rounded at about the same distance, and when it bears **S.**, about four hundred yards off, anchorage will be found in fifteen and a half feet, hard bottom; or vessels may steer to the northward, following the directions given above.

Or, from the red buoy on the eastern end of Suceonesset Shoal, **NE.** may be steered, which course will lead up to the bell-buoy on Lone Rock. Pass to the eastward of this buoy, and follow the directions given above.

POPONESSET BAY

lies about five-eighths of a mile to the southwestward of Osterville inlet, and is a wide but shallow bay of irregular shape, and entirely unfit for strangers,—the entrance being closed by flats, dry at low water. About four miles and a half to the southwestward of it lies the entrance to **Waquoit Bay**,—a broad but shallow bay, making in a northerly direction for about a mile and five-eighths to **Waquoit Village**. The bay has an average width of half a mile, between low sandy shores, partly wooded and partly cleared; but its entrance is less than two hundred yards wide, and unfit for navigation, except by vessels of the smallest size.

FALMOUTH HARBOR,

a little over four miles to the westward of the entrance to Waquoit Bay, is, in reality, no harbor at all, except in northerly or westerly winds. Its vicinity is easily recognized by the numerous windmills placed close to the shore and connected with the extensive salt-works at that point. There are also several wharves for the accommodation of vessels which resort thither. All of this shore is foul, and should not be approached nearer than five-eighths of a mile. (See also pages 84 and 87 for more detailed description of this part of the North Shore.)

WOOD'S HOLE.

Two miles and three-quarters to the southwestward of Falmouth Harbor lies the entrance to Wood's Hole, a somewhat crooked passage, leading into Buzzard's Bay, between the southwestern end of the peninsula of Cape Cod and the eastern end of Nonamesset Island. (See also pages 87-88.) Its eastern point of entrance, called Nobska Point, is a high round head with slightly undulating surface, covered with grass, showing steep sandy faces on all sides, and surmounted by a light-house called Nobska Point Light-house, which is a useful guide to vessels passing through the Sound as well as those wishing to enter the harbor. The light is shown from a red tower thirty-five feet high, and is a fixed white light, of the fifth order of Fresnel, visible thirteen miles. The keeper's dwelling, which is a one and a half story building, painted drab color, stands a short distance to the eastward of the tower. The light is eight or nine feet above the level of the sea, and its geographical position is

Latitude -----	41° 30' 55" N.
Longitude -----	70° 28' 19" W.

NANTUCKET AND VINEYARD SOUNDS FROM CROSS RIP TO NOBSKA POINT

Scale Bar

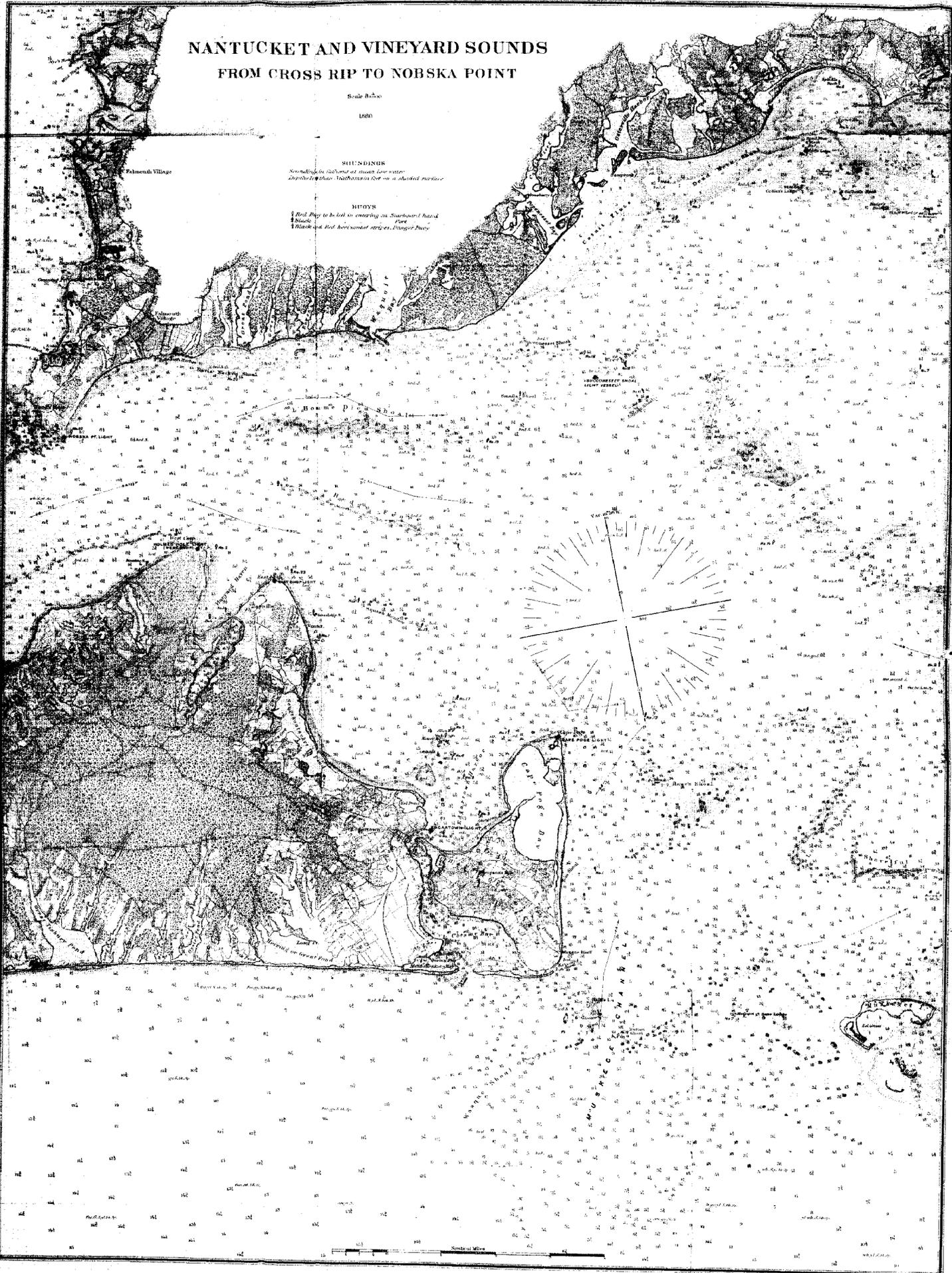
1000

SOUNDINGS

Soundings in fathoms of mean low water
depth of three fathoms or less in shaded surface

BOYS

Red Pipe to be led in crossing on Starboard side
Black Pipe to be led in crossing on Port side



bears from

	Miles.
Succoneset Shoal Light-vessel, W. $\frac{3}{4}$ N.-----	nearly 10
Cross Rip Light-vessel, NW. by W. $\frac{1}{4}$ W.-----	nearly 17
West Chop Light-house, NW. $\frac{1}{4}$ N.-----	3 $\frac{1}{2}$
Tarpaulin Cove Light-house, E. by N. $\frac{1}{4}$ N.-----	5 $\frac{1}{2}$
Gay Head Light-house, NE. $\frac{3}{4}$ E.-----	12 $\frac{3}{8}$

A short distance to the southwestward of the light-house will be seen the bell-tower, containing a fog-bell which is struck by machinery. The bell, during thick or foggy weather, is struck twice in quick succession, followed by an interval of thirty seconds, and then gives a single blow, followed by the same interval.

Nonamesset Island, which lies on the western side of the entrance, is about a mile and an eighth long, and presents an undulating surface, diversified with cultivated fields, woods and grass land. Its eastern end, called **Mink Point**, is low and nearly level, faced with rocks, and covered only with a scant growth of grass.

There are three harbors in Wood's Hole, viz: Little Harbor, on the eastern side, the entrance to which is nearly half a mile to the northwestward of Nobska Point; Great Harbor, (the principal anchorage,) lying just to the westward of Little Harbor; and Hadley's Harbor, on the western shore of the passage contained between Uncatena and Nonamesset islands. **Little Harbor** is contained between part of the southwestern end of Cape Cod and a long, low, nearly level and grassy point, with precipitous sandy faces to the southward and westward, and partly covered with low scrub. This is called **Parker's Neck**. Seven feet only at mean low water can be carried into this harbor.

Great Harbor, which is the harbor proper and the usual anchorage, is contained between the mainland on the east and an irregularly-shaped island, called **Long Neck**, on the north and west. This island is of moderate height, undulating, covered only with grass, and has on its eastern side several houses and a wharf, which are plainly visible to vessels approaching the harbor from Vineyard Sound. A breakwater, about forty yards long, joins it to the mainland. Anchorage may be found in Great Harbor in from four to ten fathoms, sheltered from all winds. **Hadley's Harbor** is a cove of irregular shape, contained between the southeastern shore of Uncatena, the western end of Nonamesset, and a small portion of the eastern end of Naushon, with its outlying islets. It has good anchorage in from two to three fathoms, but the entrance is much obstructed by dangerous ledges, and it is not, therefore, recommended to strangers.

Harbors in Wood's Hole.

DANGERS

IN APPROACHING AND ENTERING WOOD'S HOLE.

I. Coming from the Eastward, to enter by the Main Channel and anchor in Great Harbor.—

In approaching this harbor from the eastward by either of the channels of Nantucket Sound, the first danger met with will be found on the N. $\frac{1}{4}$ W. course, and about a quarter of a mile from the eastern end of Nonamesset Island. This is called Nonamesset Point Shoal, **Nonamesset Point Shoal.** and is marked by a black spar-buoy. The eastern point of Nonamesset Island is a shoal,—a long flat, with many sunken rocks upon it, having from one to five feet at low water, extending off to the eastward for two hundred yards, and shoal water to the southeastward of this a quarter of a mile from shore. On this southeastern extremity is placed the buoy, which is marked No. 1, and bears from Holmes' Hole Light-house NW. $\frac{1}{4}$ W., three and three-quarter miles, and from Nobska Point Light-house W. by S. $\frac{1}{2}$ S., about three-quarters of a mile distant.

Opposite to the buoy on Nonamesset Point Shoal, on the eastern side of the channel, will be seen a red spar-buoy. This is on the southwestern end of Great Ledge, which is the name given to a mass of rocks, some of which are out at low water, lying at the southern extremity of the long shoal which makes in a southerly direction from Parker's Neck for three-eighths of a mile. **Great Ledge.** The buoy is marked No. 2, placed in eighteen feet on the southwestern point of the ledge, and bears from Nobska Point Light-house W. by S. $\frac{1}{2}$ S., five-eighths of a mile, and from the black buoy on Nonamesset Point Shoal E. by N. $\frac{1}{2}$ N., distant two hundred yards, which is here the width of the channel.

Great Ledge lies between the Main Channel and the Eastern Channel for light-draught vessels,—the former passing to the westward and the latter to the eastward of it. The buoy (No. 2) on Great Ledge and that on Nonamesset Point Shoal (No. 1) mark clearly the limits of the channel at the entrance. When past them, vessels must not approach the eastern end of Nonamesset Island nearer than three hundred and fifty yards, to avoid the shoals which make off from it to the eastward for two hundred and fifty yards; and it is not well to approach Parker's Neck nearer than two hundred yards until the red spar-buoy on Parker's Flats can be seen, when the course must be shaped so as to pass to the westward of it.

When nearly up with Parker's Neck there will be seen well to the westward of the course, and about a quarter of a mile off, a red spar-buoy. This is on the southern end of Red Ledge, which is awash at low water, and forms the southern extremity of a mass of shoal ground, dry in many places at low tide, which lies about four hundred and fifty yards to the westward of the bluff land of Parker's Point and nearly in the middle of the passage **Red Ledge.**

leading to Hadley's Harbor and Buzzard's Bay. The buoy is marked No. 2, placed in ten feet water on the southern side of the ledge, and bears from

	Mile.
The black buoy on Nonamesset Point Shoal, N. by W. $\frac{1}{2}$ W.-----	a little over $\frac{1}{2}$
The southern extremity of Parker's Neck, W. by N. $\frac{3}{4}$ N.-----	nearly 700 yds.
The northeastern extremity of Mink Point, NE.-----	a little over 200 yds.

It is colored and numbered for the passage leading to the westward into Hadley's Harbor and Buzzard's Bay, and vessels bound into Great Harbor pass well to the eastward of it.

Parker's Flats make off from the bluff land of Parker's Neck to a distance of two hundred yards, and have but five feet water upon them one hundred and fifty yards from shore. A red spar-buoy (No. 4) is placed on their western edge in eighteen feet water, and the sailing-line passes to the westward of it close-to, so that vessels must be careful to watch the range of the buoy with the houses on Bar Neck, to the northward of it, to avoid being set by the strong tidal current on to the flats.

On the western side of the passage, nearly abreast of the buoy on Parker's Flats, bearing from it W. $\frac{3}{4}$ N., and distant about two hundred and seventy-five yards, will be seen an iron spindle with cage on top. This is on Lone Rock, a small detached rock, dry at low water, which lies at the northern end of the

Lone Rock. mass of shoal ground extending from Red Ledge buoy to the northward for three hundred yards, or to within one hundred yards of Grassy Island. Between this spindle and Grassy Island there is a narrow channel, sometimes called the Northeast Channel, which leads to the westward past Long Neck, and thence out into Buzzard's Bay. Through this channel not less than eight feet may be carried; but it is rarely used and is not recommended. (It has been reported, under date of December 4, 1879, that Lone Rock was successfully blasted away, but to what depth was not stated.)

The spindle on Lone Rock is frequently carried away during the winter by ice; but the course for Great Harbor passes well to the eastward of it, and in order to avoid the rock it is only necessary to pass pretty close to the buoy on Parker's Flats. When past this buoy, a black spar-buoy will be seen lying nearly in the middle of the entrance to Great Harbor, and bearing about NW., about three hundred and fifty yards off. This is on the northern end of a ledge called Grassy Island

Grassy Island Ledge. Ledge, making off to the northward from a very small, low island, called Grassy Island. It is a mass of shoal ground with only five feet at mean low water, and with a number of sunken rocks scattered along its surface near its northeastern end. The

ledge surrounds the island upon all sides,—extending to the northward and westward for a distance of nearly one hundred and seventy-five yards; but on the eastern side of the island it is quite bold-to,—eighteen feet being found at a distance of only fifty yards. The buoy is marked No. 3, is placed in sixteen feet water off the northern end of the ledge, and bears from the red spar-buoy on Parker's Flats NW. $\frac{3}{4}$ N., a little over four hundred yards, and from Grassy Island N. $\frac{3}{4}$ E., one hundred and sixty yards distant. The sailing-line passes a little over one hundred yards to the eastward of it. A good rule for avoiding the northern end of this ledge is not to go to the westward of Parker's Flats buoy in range with the southern extremity of Parker's Neck.

On the eastern side of the harbor, and nearly directly opposite the black buoy (No. 3) on Grassy Island Ledge, will be seen a red spar-buoy. This is on Railway Ledge, which makes

Railway Ledge. off to the westward from Bar Neck for nearly one hundred and fifty yards and has from three to twelve feet water upon it. The buoy is placed in twelve feet, rocky bottom, off the southwestern end of the ledge, is marked No. 6, and bears from the black buoy on Grassy Island Ledge NE. by N. $\frac{1}{4}$ N., distant two hundred yards, (which is here the width of the channel,) and from the red buoy on Parker's Flats N. by W. $\frac{1}{2}$ W., a little over a quarter of mile distant. The sailing-line passes a little over one hundred yards to the westward of it.

After passing Railway Ledge buoy there are no dangers, and vessels may steer directly for the head of the harbor, anchoring according to draught. Shoal water makes off to the eastward from Long Neck for about four hundred yards; but the soundings are gradual, and from six to sixteen feet are found at a distance of three hundred yards from shore. The northern shore may be safely approached to within one hundred yards,—sixteen feet being found at that distance from it.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING WOOD'S HOLE.

I. *Coming from the Eastward, to enter by the Main Channel and anchor in Great Harbor.*—Having come through the North Channel of Nantucket Sound, and wishing to make an anchorage in Great Harbor; when, on the course W. $\frac{3}{4}$ N. from Succonesset Shoal Light-vessel, Nobska Point Light-house bears W., nearly four miles distant, and Holmes' Hole Light-house SW. $\frac{1}{2}$ S., a little over three and one-eighth miles distant, the depth will be twelve fathoms and the course W. $\frac{1}{2}$ S. to the entrance.

On this course there is not less than six fathoms; and when Nobska Point Light-house *Sailing Directions--Wood's Hole.* bears NE. $\frac{1}{2}$ E., nearly seven-eighths of a mile distant, with seven fathoms water, the course is N. $\frac{1}{4}$ W., leading midway between the black buoy on Nonamesset Point Shoal and the red buoy on Great Ledge. The N. $\frac{1}{4}$ W. course should be continued, passing to the westward of the red buoy on Parker's Flats close-to, and carrying not less than fifteen feet water, until the bluff of Wood's Hole is nearly in range with the southern end of Bar Neck wharf and the black buoy on Grassy Island Ledge bears W. by N. $\frac{3}{4}$ N., an eighth of a mile distant. The course may now be shaped for Bar Neck wharf, if wishing to anchor off the village; or, desiring to proceed up the harbor, vessels should steer NW., carrying not less than three and a half fathoms, and anchoring at discretion in from six fathoms to twelve feet water.

The above courses pass a little over three-eighths of a mile to the southward of Nobska Point Light-house; nearly one hundred yards to the westward of the red spar-buoy on Great Ledge, and the same distance to the eastward of the black buoy on Nonamesset Point Shoal; a little over an eighth of a mile to the westward of the southern extremity of Parker's Neck; three hundred and twenty-five yards to the eastward of the red spar-buoy on Red Ledge; about twenty-five yards to the westward of the red spar-buoy on Parker's Flats; one hundred and twenty-five yards to the eastward of the black spar-buoy on Grassy Island Ledge; and eighty-five yards to the westward of the red spar-buoy on Railway Ledge.

Or, having come through the Middle Channel of Nantucket Sound, to enter Wood's Hole and anchor in Great Harbor.—The W. by N. $\frac{1}{2}$ N. course for Nobska Point Light-house should be continued until within one mile and an eighth of it, and Holmes' Hole Light-house bears S SE., distant a little over two miles and three-eighths; when W. $\frac{1}{2}$ S. must be steered, carrying not less than seven fathoms, until Nobska Point Light-house bears NE. $\frac{1}{2}$ N., nearly seven-eighths of a mile distant; when the course is N. $\frac{1}{4}$ W., as before, following the directions previously given.

Or, having come through the South or Main Channel of Nantucket Sound, to enter Wood's Hole and Great Harbor.—The NW. by W. course for Nobska Point Light-house should be continued until within one and a half miles of it, and Holmes' Hole Light-house bears S SE., distant one mile and seven-eighths. Thence the course for the entrance is W. $\frac{3}{4}$ N., carrying not less than nine fathoms, until Nobska Point Light-house bears NE. $\frac{1}{2}$ E., distant nearly seven-eighths of a mile, as before; when N. $\frac{1}{4}$ W. should be steered, following the directions previously given.

DANGERS

IN APPROACHING AND ENTERING WOOD'S HOLE.

II. *Coming from the Eastward, to enter by the Main Channel and pass through into Buzzard's Bay.*—With Nobska Point Light-house bearing NE. $\frac{1}{2}$ E., distant nearly seven-eighths of a mile, the course for the entrance to the Main Channel of Wood's Hole is N. $\frac{1}{4}$ W. On this course there will be seen ahead two spar-buoys,—one red and one black. The black spar-buoy is on Nonamesset Point Shoal, a long shoal making off to the eastward from Nonamesset Island. The eastern point of Nonamesset Island is shoal,—a long flat with many sunken rocks upon it, having from one to five feet upon them at low water extending off to the eastward for two hundred yards, and shoal water to the southeastward of this a quarter of a mile from shore. On this southeastern extremity is placed the buoy, which is marked No. 1, and bears from Holmes' Hole Light-house NW. $\frac{1}{4}$ W., three and three-quarter miles, and from Nobska Point Light-house W. by S. $\frac{1}{2}$ S., about three-quarters of a mile distant.

The red spar-buoy is on Great Ledge, a mass of shoal ground, with many sunken rocks scattered over its surface,—some of which are bare at low water. It is the southern extremity of a long shoal which makes off in a southerly direction from Parker's Neck, and lies between the Main Channel and the Eastern Channel for light-draught vessels. The buoy is marked No. 2, placed in eighteen feet on the southwestern point of the ledge, and bears from Nobska Point Light-house W. by S. $\frac{1}{2}$ S., five-eighths of a mile, and from the black buoy on Nonamesset Point Shoal E. by N. $\frac{1}{2}$ N., distant two hundred yards, which is here the width of the channel.

When past the buoys on Nonamesset Point and Great Ledge do not approach the eastern end of Nonamesset Island nearer than three hundred and fifty yards; and it is not well to go to the eastward of Great Ledge buoy bearing S. $\frac{1}{4}$ W., in order to avoid the shoal water making off to the southward and eastward from Parker's Neck, until the red spar-buoy on Red Ledge is seen bearing about NW., when the course must be shaped so as to pass to the southward of it, close-to.

Red Ledge is the name given to the southern extremity of a mass of shoal ground, dry in many places at low water, which lies about four hundred and fifty yards to the westward of the bluff land of Parker's Point and nearly in the middle of the passage. The buoy is marked

Red Ledge. No. 2, placed in ten feet water on the southern side of the ledge, (which is awash at low water,) and bears from the black buoy on Nonamesset Point Shoal N. by W. $\frac{1}{4}$ W., a little over half a mile, and from the northeastern extremity of Mink Point NE., a little over two hundred yards distant. Vessels must pass about twenty-five yards to the southward of this buoy, and should be careful not to go to the northward and eastward of its range with the red spar-buoy on Great Ledge, to avoid being set on to the shoal ground making off from Red Ledge.

When up with Red Ledge buoy there will be seen ahead, a little to the southward of the course, a black nun-buoy of the third class. This is on the eastern end of Middle Ledge, a mass of sunken rocks, many of which are dry at low water, extending in a nearly E. and W. direction for about a quarter of a mile. Five feet at low water is found in some places along its length.

Middle Ledge. The eastern end of the ledge is sometimes called *Dry Ledge*, is bare at low water, and off its eastern side, in eight feet, is placed the buoy, which is marked No. 1, and bears from Red Ledge buoy NW. by W. $\frac{1}{2}$ W., a little over an eighth of a mile, and from the northeastern extremity of Mink Point NW. by N., about three hundred and fifty yards distant. The sailing-line passes about sixty yards to the northward of this buoy, and when past it, and within one hundred and fifty yards of the southeastern extremity of Long Neck, the course turns to the westward. Vessels must not approach this southeastern extremity of Long Neck nearer than one hundred yards in order to avoid the shoals which make off from it to the southward. In this vicinity the shoals extend from shore to shore across the channel, and not more than fifteen feet can be carried over them. In passing through this part of the channel particular care must be taken to make the courses good, and ranges are easily found along the shores to assist in so doing.

Having passed the black nun-buoy on the eastern end of Middle Ledge and turned to the westward, there will be seen, a little to the southward of the course, and bearing about WSW., a black spar-buoy, which is on the western end of Middle Ledge, on what are sometimes called the *Entrance Rocks*,—a number of sunken rocks, some of which are bare at low water. The buoy is placed in twelve feet, hard bottom, is marked No. 3, and the sailing-line passes one hundred and fifty yards to the northward of it. It bears from the black nun-buoy on the eastern end of the ledge W. $\frac{1}{4}$ N., a little over four hundred yards, and from the southeastern extremity of Long Neck SW. $\frac{1}{2}$ S., nearly an eighth of a mile distant.

After passing the black buoy on the western end of Middle Ledge there will be seen to the southward, and about a quarter of a mile off, a spar-buoy painted red and black in horizontal stripes.

Hadley's Rock. This is on Hadley's Rock, a sunken ledge, with as little as four feet upon it at low water and from twelve to fifteen feet upon all sides of it. The buoy is placed in twelve feet off the northern side of the rock, and bears from the black spar-buoy on the western end of Middle Ledge W. by S. $\frac{1}{4}$ S., a quarter of a mile distant. The sailing-line passes an eighth of a mile to the northward of it.

When abreast of Hadley's Rock buoy, with the black spar-buoy on the western end of Middle Ledge nearly in range with the northeastern extremity of Mink Point, vessels should be careful to avoid a sunken rock which lies about sixty yards to the northward of the course. It has five feet at mean low water and from nine to eighteen feet on all sides of it, and is not buoyed. It bears from Hadley's Rock buoy N. $\frac{1}{4}$ E., a little over an eighth of a mile, and from the black buoy on the western end of Middle Ledge WNW., a quarter of a mile distant. This latter buoy, as before mentioned, will be nearly in range with the northeastern extremity of Mink Point.

With Hadley's Rock buoy bearing S. by E. $\frac{1}{4}$ E., the channel turns to the northward, and there will be seen, a little to the eastward of the course, a red spar-buoy. This is on Long Neck Rock, and marks the southwestern extremity of an extensive piece of shoal ground making off to the southward and westward from Long Neck. The rock has three feet upon it at low water, and from twelve to eighteen feet around it. The buoy is marked

Long Neck Rock. No. 4, placed in thirteen feet off the southwestern side of the rock, and bears from the black buoy on the western extremity of Middle Ledge NW. $\frac{1}{4}$ W., nearly three-eighths of a mile, and from Hadley's Rock buoy N., a little over a quarter of a mile distant. The sailing-line passes to the westward of the buoy.

When past the buoy on Long Neck Rock the bay is well open, and there are no dangers until up with the black spar-buoy on Naushon Point Shoal, a long shoal, with from five to eighteen feet upon it, extending off to the northeastward from Uncatena Island for nearly a quarter of a mile. A ledge with four feet at mean low water lies one hundred and fifty yards inshore of the buoy, which is marked No. 5, placed in fifteen feet, soft bottom, and bears from

Naushon Point Shoal. Long Neck Rock buoy NW., a little over three-eighths of a mile, and from the northeastern point of Uncatena Island NE. by N. $\frac{1}{4}$ N., four hundred and twenty-five yards distant. The sailing-line passes a little over an eighth of a mile to the eastward of it. When past this buoy the course may be shaped for New Bedford or up the bay.

About one mile and an eighth from Naushon Point Shoal buoy, and bearing about **W NW.**, will be seen a spar-buoy painted red and black in horizontal stripes. This is on Wæpecket Rock, a sunken ledge, with two feet upon it at mean low water. Shoal water surrounds it for a distance of one hundred yards, and it lies almost directly in the way of vessels bound for New *Wæpecket Rock*. Bedford from Wood's Hole. The rock bears from the northeastern extremity of Ucatena Island **NW.** by **W.** **Westerly**, nearly one mile and an eighth distant. The buoy is placed in eleven feet off the southern side of the rock, and may be passed on either hand by giving it a berth.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING WOOD'S HOLE.

II. Coming from the Eastward, to enter by the Main Channel and pass through into Buzzard's Bay.—Having come through the North Channel of Nantucket Sound, and wishing to pass through Wood's Hole into Buzzard's Bay, when, on the course **W.** $\frac{3}{4}$ **N.** from Succonesset Shoal Light-vessel, Nobska Point Light-house bears **W.**, nearly four miles distant, and Holmes' Hole Light-house **SW.** $\frac{3}{4}$ **S.**, a little over three and one-eighth miles distant, the depth will be twelve fathoms and the course **W.** $\frac{1}{2}$ **S.** to the entrance. On this course there is not less than six fathoms water, and when Nobska Point Light-house bears **NE.** $\frac{1}{2}$ **E.**, nearly seven-eighths of a mile distant, with seven fathoms, the course is **N.** $\frac{1}{4}$ **W.**, leading midway between the black buoy on Nonamesset Point Shoal and the red buoy on Great Ledge. The **N.** $\frac{1}{4}$ **W.** course should be continued, carrying not less than fifteen feet water, until Nobska Point Light-house bears **E.** by **S.**, distant nearly three-quarters of a mile, and the bluff land on the southern extremity of Parker's Neck bears **E NE.**, distant a little over three hundred yards, when the depth will be fifteen feet and the course **NW.** $\frac{1}{4}$ **W.**, heading directly for the red buoy on Red Ledge. Vessels should pass to the southward of this buoy close-to, and continue the course nearly for the southern extremity of Long Neck, passing to the northward of the black nun-buoy on the eastern end of Middle Ledge, and carrying not less than fifteen feet water, until the southern extremity of Parker's Neck bears **SE.** by **E.** $\frac{1}{2}$ **E.**, distant a little over half a mile, and the black nun-buoy on the eastern end of Middle Ledge is in range with Mink Point. The depth will now be eighteen feet and the course **W.** Southerly, passing to the northward of the black spar-buoy on the western end of Middle Ledge and about an eighth of a mile to the northward of the horizontally-striped buoy on Hadley's Rock, and carrying not less than fifteen feet. Vessels must be careful to make this course good, so as to avoid the sunken rock which lies just to the northward of it. When Hadley's Rock buoy bears **S.** by **E.** $\frac{1}{4}$ **E.**, distant nearly an eighth of a mile, and the black spar-buoy on the western end of Middle Ledge is nearly in range with the red buoy on Red Ledge, the depth will be five fathoms and the course **N.** by **W.** $\frac{1}{4}$ **W.**, passing to the westward of the red spar-buoy on Long Neck Rock and to the eastward of the black buoy on Naushon Point Shoal, and carrying not less than four and a quarter fathoms water. The bay is now open, and with the black spar-buoy on Naushon Point Shoal bearing **S.** by **W.** $\frac{1}{2}$ **W.**, in range with the eastern extremity of Ucatena Island, the depth will be five fathoms, and the course may be shaped **NW.** by **W.** $\frac{3}{4}$ **W.** for the entrance to New Bedford; **N.** by **W.** $\frac{3}{4}$ **W.** for Mattapoiset Harbor; **N.** $\frac{1}{2}$ **W.** for the entrance to Sippican; and **N.** $\frac{1}{2}$ **E.** to a position one and a quarter miles to the westward of Wing's Neck Light-house and for the entrance to Wareham River.

The above courses pass a little over three-eighths of a mile to the southward of Nobska Point Light-house; nearly one hundred yards to the westward of the red spar-buoy on Great Ledge; the same distance to the eastward of the black spar-buoy on Nonamesset Point Shoal; a little over an eighth of a mile to the southward and westward of the southern end of Parker's Neck; about twenty-five yards to the southward of the red buoy on Red Ledge; nearly one hundred yards to the eastward of the black nun-buoy on the eastern end of Middle Ledge; one hundred yards to the southward of the southern end of Long Neck; nearly one hundred and fifty yards to the northward of the black spar-buoy on the western end of Middle Ledge; an eighth of a mile to the northward of the horizontally-striped buoy on Hadley's Rock; one hundred and fifty yards to the westward of the red spar-buoy on Long Neck Rock; and a little over an eighth of a mile to the northward and eastward of the black spar-buoy on Naushon Point Shoal.

Or, the N. $\frac{1}{4}$ W. course may be continued, passing well to the eastward of the red buoy on Red Ledge, until up with the red spar-buoy on Parker's Flats, (which will be seen ahead,) passing it close-to. When about one hundred yards to the northward of this buoy, with the bluff of Wood's Hole bearing

NE. by **E.** $\frac{1}{4}$ **E.**, the course is **W.** Southerly, passing midway between Grassy Island (to the northward) and the spindle on the northern end of Red Ledge, carrying not less than eight feet; after which, when up with the black nun-buoy on the eastern end of Middle Ledge, vessels should follow the directions given above. This passage, however, is rarely used.

Or, having come through the Middle Channel of Nantucket Sound, to enter Wood's Hole and pass through into Buzzard's Bay.—The **W.** by **N.** $\frac{1}{2}$ **N.** course for Nobska Point Light-house should be continued until within one mile and an eighth of it and Holmes' Hole Light-house bears **S SE.**, distant a little over two miles and three-eighths, when **W.** $\frac{1}{2}$ **S.** should be steered, carrying not less than seven fathoms, until Nobska Point Light-house bears **NE.** $\frac{1}{2}$ **E.**, nearly seven-eighths of a mile distant, when the course is **N.** $\frac{1}{4}$ **W.**, as before, following the directions given above.

Or, having come through the South or Main Channel of Nantucket Sound, to enter Wood's Hole and pass through into Buzzard's Bay.—The **NW.** by **W.** course for Nobska Point Light-house should be continued until within one and a half miles of it and Holmes' Hole Light-house bears **S SE.**, distant one mile and seven-eighths. Thence the course for the entrance is **W.** $\frac{3}{4}$ **N.**, carrying not less than nine fathoms, until Nobska Point Light-house bears **NE.** $\frac{1}{2}$ **E.**, distant nearly seven-eighths of a mile, as before. Now steer **N.** $\frac{1}{4}$ **W.** for the entrance buoys, following the directions previously given.

Wishing to enter Hadley's Harbor.—This is an excellent harbor and comparatively easy of access. Vessels wishing to make an anchorage have only to avoid *Hadley's Rock* (previously described on page 148) and a small narrow strip of shoal ground lying nearly in the entrance to the harbor, and which forms part of the shoals making off to the eastward from Uncatena Island. It has a number of rocks upon it, some of which are bare at low water, and two feet only is found upon its southern end. Between this shoal and Nonamesset Island the available channel is only about fifty yards wide, with a depth of sixteen feet; but when past this, secure anchorage is found in from ten feet to three and a quarter fathoms.

To enter this harbor.—When, on the **W.** Southerly course from abreast of the southern extremity of Long Neck, the horizontally-striped buoy on Hadley's Rock bears **S.** by **E.** $\frac{1}{4}$ **E.**, distant a little over an eighth of a mile, **W SW.** should be steered for about three-eighths of a mile, anchoring in from eighteen feet to three and three-quarter fathoms; or, wishing to enter the Inner Harbor, the course must be continued, keeping about fifty yards from the western end of Nonamesset Island; and when the northeastern extremity of Uncatena Island bears **N.** by **E.** $\frac{1}{2}$ **E.** the course turns to the westward, and anchorage is found in from ten feet to three and a quarter fathoms.

DANGERS

IN APPROACHING AND ENTERING WOOD'S HOLE.

III. Coming from the Eastward, to enter by the Eastern Channel and anchor in Little Harbor.—This channel, used only by light-draught vessels, or those who intend to anchor in Little Harbor, crosses the shoals making off to the southward from the mainland of Cape Cod, and carries not less than ten feet at mean low water. Not more than six feet, however, can be taken into Little Harbor. Vessels approaching Wood's Hole from the eastward by either of the channels of Nantucket Sound, and intending to enter by the Eastern Channel, bring Nobska Point Light-house to bear **NW.** by **N.**, distant nearly half a mile, and Holmes' Hole Light-house **SE.** $\frac{1}{2}$ **S.**, distant two and three-quarter miles, and steer **NW.** by **W.** $\frac{1}{2}$ **W.** On this course the first danger met with lies a little to the southward of the course and is marked by a black spar-buoy. This is on the northeastern end of Great Ledge, the southern extremity of a mass of shoal ground making off to the southward from Parker's Point for three-eighths of a mile. A number of rocks, many of which are bare at low water, lie scattered over its area. The buoy is marked No. 1, and is placed in eighteen feet, hard bottom, off the eastern side of a sunken ledge, called *Coffin Rock*, which has four feet upon it at low water. The buoy bears from Nobska Point Light-house **W SW.**, about three-eighths of a mile, and from the southern extremity of Parker's Neck **SE.** by **S.** $\frac{1}{2}$ **S.**, a little over three-eighths of a mile distant. The sailing-line passes to the northward of it.

When up with Coffin Rock buoy there will be seen, a little to the northward of the course, a red spar-buoy. This is on Lone Rock, a sunken ledge, with three feet at mean low water, lying an eighth of a mile from shore. The buoy is marked No. 2, placed in twelve feet to the southward of the rock, and bears from Nobska Point Light-house **W.** by **N.**, a little over three-eighths of a mile, and from the black buoy on Coffin Rock **N.** $\frac{1}{2}$ **W.**, nearly a quarter of a mile distant. The sailing-line passes to the southward of it, and when past it the course may be shaped for the head of Little Harbor, or to the westward, to enter Great Harbor and to pass through Wood's Hole into Buzzard's Bay.

VINEYARD SOUND

FROM WOOD'S HOLE TO CUTTYHUNK

Scale 6000

1880

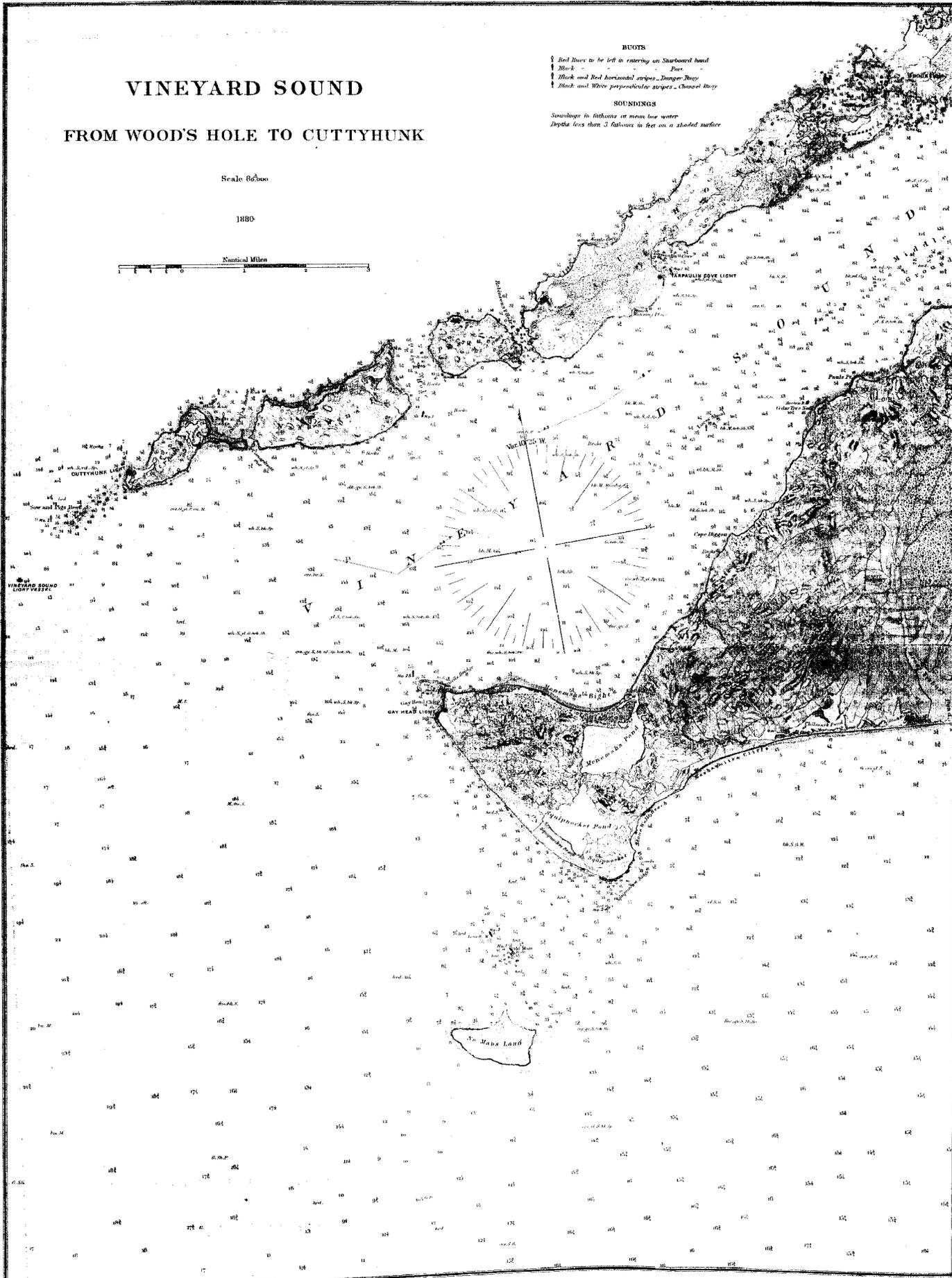


BUOYS

- Red Buoy to be left in entering on Starboard hand
- Black Buoy to be left in entering on Starboard hand
- Black and Red horizontal stripes - Danger Buoy
- Black and White perpendicular stripes - Channel Buoy

SOUNDINGS

Soundings in fathoms at mean low water.
 Depths less than 3 fathoms in feet on a shaded surface.



SAILING DIRECTIONS

FOR APPROACHING AND ENTERING WOOD'S HOLE.

III. *Coming from the Eastward, to enter by the Eastern Channel and anchor in Little Harbor.*—

Having come through either of the channels of Nantucket Sound, and wishing to enter Wood's Hole by this passage, vessels should bring Nobska Point Light-house to bear **NW.** by **N.**, distant nearly half a mile, and Holmes' Hole Light-house **SE.** $\frac{1}{2}$ **S.**, distant two and three-quarter miles. The depth will be nine fathoms, and the course **NW.** by **W.** $\frac{1}{2}$ **W.** nearly for the southeastern extremity of Mink Point, carrying not less than twelve feet, passing to the northward of the black buoy on Coffin Rock and nearly an eighth of a mile to the southward of the red buoy on Lone Rock. When past this buoy, and Nobska Point Light-house bears **E.**, nearly half a mile distant, and the southern extremity of Parker's Neck **N.** by **W.** $\frac{3}{4}$ **W.**, four hundred yards distant, the depth will be twelve feet and the course **N.** $\frac{1}{2}$ **E.** for the head of the harbor, heading nearly for the southern end of a long wharf making out from Wood's Hole village and carrying not less than six feet water.

The above courses pass nearly a quarter of a mile to the southward of Nobska Point Light-house; one hundred and sixty yards to the northward of the black spar-buoy on Coffin Rock; two hundred yards to the southward, and one hundred and fifty yards to the westward, of the red spar-buoy on Lone Rock; and two hundred yards to the eastward of the southern extremity of Parker's Neck.

Or, wishing to anchor in Great Harbor, the **NW.** by **W.** $\frac{1}{2}$ **W.** course should be continued until Nobska Point Light-house bears **E.** by **S.**, distant nearly three-quarters of a mile, when the course is **N.** $\frac{1}{4}$ **W.**, following the directions given for the harbor, on page 147.

Wishing to pass through Wood's Hole and enter Buzzard's Bay.—The **NW.** by **W.** $\frac{1}{2}$ **W.** course should be continued until Nobska Point Light-house bears **E.** by **S.**, distant nearly three-quarters of a mile, as before, when **NW.** $\frac{1}{4}$ **W.** should be steered, following the directions previously given, on pages 149-150.

DANGERS

IN APPROACHING AND ENTERING WOOD'S HOLE.

IV. *Coming from the Westward, to enter by the Main Channel and pass through into Buzzard's Bay.*—Approaching Wood's Hole from the westward, and wishing to make an anchorage or to pass through into Buzzard's Bay, when, on the course **E.** by **N.** $\frac{3}{4}$ **N.** from Vineyard Sound Light-vessel, Tarpaun Cove Light-house bears **W.** $\frac{1}{2}$ **N.**, distant two and a half miles, the depth will be eleven fathoms, and the course **NE.** $\frac{1}{2}$ **E.** for Nobska Point Light-house until within about seven-eighths of a mile of it, when the depth will be seven fathoms and the course **N.** $\frac{1}{4}$ **W.** for the entrance. On this course there will soon be seen ahead two spar-buoys,—one red and one black. The black spar-buoy is on Nonamesset Point Shoal, a long shoal making off to the eastward from Nonamesset Island. This shoal has many sunken rocks upon it, with from one to five feet at low water, and extends off to the eastward for two hundred yards; but there is less than fifteen feet at low water to the southeastward of this for a quarter of a mile from shore. On this southeastern extremity is placed the buoy, which is marked No. 1, and bears from Holmes' Hole Light-house **NW.** $\frac{1}{4}$ **W.**, three and three-quarter miles, and from Nobska Point Light-house **W.** by **S.** $\frac{1}{2}$ **S.**, about three-quarters of a mile distant.

The red spar-buoy is on Great Ledge, an area of shoal ground with many rocks scattered over it, some of which are bare at low water. It is the southern extremity of a long shoal which makes off in a southerly direction from Parker's Neck, and lies between the Main Channel and the Eastern Channel for light-draught vessels. The buoy is marked No. 2, placed in eighteen feet on the southwestern extremity of the ledge, and bears from Nobska Point Light-house **W.** by **S.** $\frac{1}{2}$ **S.**, five-eighths of a mile, and from the black buoy on Nonamesset Point Shoal **E.** by **N.** $\frac{1}{2}$ **N.**, distant two hundred yards, which is here the width of the channel.

When past the buoys on Nonamesset Point Shoal and Great Ledge, vessels must not approach the eastern end of Nonamesset Island nearer than three hundred and fifty yards, to avoid the shoals which make off from it to the eastward for two hundred and fifty yards; and it is not well to approach the western edge of the shoals which make off to the southward from Parker's Neck nearer than to bring the red buoy (No. 2) on Great Ledge to bear **S.** $\frac{1}{4}$ **W.** until the red spar-buoy on Red Ledge is seen bearing about **NW.**, when the course must be shaped so as to pass to the southward of it close-to.

Red Ledge is the name given to the southern extremity of an area of shoal ground, dry in many places at low water, which lies about four hundred and fifty yards to the westward of the bluff land of Parker's Point and nearly in the middle of the passage. The buoy is marked No. 2, placed in twelve feet water on the southern extremity of the ledge,

*Nonamesset Point Shoal.**Great Ledge.**Red Ledge.*

(which is awash at low water,) and bears from the black buoy on Nonamesset Point Shoal **N.** by **W.** $\frac{1}{2}$ **W.**, a little over half a mile, and from the northeastern extremity of Mink Point **NE.**, about two hundred yards distant. This buoy must be left to the northward about twenty-five yards; and vessels should be careful not to go to the northward and eastward of its range with the red spar-buoy on Great Ledge, to avoid being set on to the shoal ground making off from Red Ledge.

When up with Red Ledge buoy there will be seen ahead, a little to the southward of the course, a black nun-buoy of the third class. This is on the eastern end of Middle Ledge, a mass of rocks, many of them bare at low water, extending in a nearly **E.** and **W.** direction for about a quarter of a mile. Five feet at low water is found in some places along its length. The eastern

Middle Ledge. end of the ledge is sometimes called *Dry Ledge*, is bare at low water, and off its eastern side, in eight feet, is placed the buoy, which is marked No. 1, and bears from Red Ledge buoy **NW.** by **W.** $\frac{1}{2}$ **W.**, a little over an eighth of a mile, and from the northeastern extremity of Mink Point **NW.** by **N.**, about three hundred and fifty yards distant. The sailing-line passes about sixty yards to the northward of this buoy, and when past it, and within one hundred and fifty yards of the southeastern extremity of Long Neck, the course turns to the westward.

When in this vicinity, vessels should not approach the southeastern extremity of Long Neck nearer than one hundred yards, to avoid the *shoals* which extend off from it to the southward. Shoal ground also extends from shore to shore across the channel,—not more than fifteen feet being found anywhere along its extent. Particular attention should be given, when in this vicinity, to make the courses good,—ranges being easily found along the shore to assist in so doing.

Having passed the black nun-buoy on the eastern end of Middle Ledge and turned to the westward, a black spar-buoy will soon be seen ahead, bearing about **WSW.** This is on the western end of Middle Ledge, on what is sometimes called the *Entrance Rocks*,—consisting of a number of rocks, some of which are bare at low water. The buoy is placed in twelve feet, hard bottom, is marked No. 3, and the sailing-line passes one hundred and fifty yards to the northeastward of it. It bears from the black nun-buoy on the eastern end of the ledge **W.** $\frac{1}{4}$ **N.**, a little over four hundred yards, and from the southeastern extremity of Long Neck **SW.** $\frac{1}{2}$ **S.**, nearly an eighth of a mile distant.

When past the buoy on the Entrance Rocks there will be seen to the southward, and about a quarter of a mile off, a spar-buoy, painted red and black in horizontal stripes. This is on Hadley's Rock, a sunken ledge, with four feet upon it at low water and from twelve to fifteen feet upon all sides. The buoy is placed in twelve feet off the northern side of the rock, and bears from the black spar-buoy on the western end of Middle Ledge **W.** by **S.** $\frac{1}{4}$ **S.**, a quarter of a mile distant. The sailing-line passes an eighth of a mile to the northward of the buoy.

When abreast of Hadley's Rock buoy, with the black spar-buoy on the western end of Middle Ledge nearly in range with Mink Point, vessels should be careful to avoid a *sunken rock* which lies about sixty yards to the northward of the course. It has five feet at mean low water and from nine to eighteen feet on all sides of it. It bears from Hadley's Rock buoy **N.** $\frac{1}{4}$ **E.**, a little over an eighth of a mile, and from the black spar-buoy on the western end of Middle Ledge (in range with Mink Point) **WNW.**, a quarter of a mile distant.

With Hadley's Rock buoy bearing **S.** by **E.** $\frac{1}{4}$ **E.**, the channel turns to the northward, and there will be seen, a little to the eastward of the course, a red spar-buoy. This is on Long Neck Rock, and marks the western extremity of an extensive piece of shoal ground making off to the southward and westward from Long Neck. The rock has three feet upon it at low water and from twelve to eighteen feet upon all sides of it. The buoy is marked No. 4, placed in thirteen feet to the southwestward of the rock, and bears from the black buoy on the western extremity of Middle Ledge **NW.** $\frac{1}{2}$ **W.**, nearly three-eighths of a mile, and from the horizontally-striped buoy on Hadley's Rock **N.**, a little over a quarter of a mile distant. The sailing-line passes to the westward of the buoy.

When past Long Neck Rock buoy there will be seen to the northwestward, a little over a quarter of a mile distant, the black spar-buoy on Naushon Point Shoal,—a long shoal with from five to eighteen feet upon it, which extends off to the northeastward from Uncatena Island for

Naushon Point Shoal. nearly a quarter of a mile. A ledge with four feet at mean low water lies one hundred and fifty yards inshore of the buoy, which is marked No. 5, placed in fifteen feet, soft bottom, and bears from the red spar-buoy on Long Neck Rock **NW.**, a little over three-eighths of a mile, and from the northeastern extremity of Uncatena Island **NE.** by **N.** $\frac{1}{4}$ **N.**, four hundred and twenty-five yards distant. The sailing-line passes to the northeastward of the buoy; and when past it the bay is open and the course may be shaped according to destination.

About one mile and an eighth from Naushon Point Shoal buoy, and bearing about **WNW.**, will be seen a spar-buoy, painted red and black in horizontal stripes. This is on Wapecket **Wapecket Rock.** Rock, a sunken ledge having one foot at mean low water. It lies almost directly in the way of vessels bound from Wood's Hole to New Bedford, and bears from the northeastern extremity of Uncatena Island **NW.** $\frac{1}{4}$ **W.**, nearly one mile and an eighth distant. The buoy is placed in eleven feet on the southern side of the ledge, and may be passed on either hand by giving it a berth of two hundred yards.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING WOOD'S HOLE.

IV. *Coming from the Westward, to enter by the Main Channel and pass through into Buzzard's Bay.*—Approaching Wood's Hole from the westward, and wishing to make an anchorage, or to pass through into Buzzard's Bay, when, on the course **E.** by **N.** $\frac{3}{8}$ **N.** from Vineyard Sound Light-vessel, Tarpaulin Cove Light-house bears **W.** $\frac{1}{2}$ **N.**, distant two and a half miles, the depth will be eleven fathoms, and the course **NE.** $\frac{1}{2}$ **E.** for Nobska Point Light-house until within about seven-eighths of a mile of it; when the depth will be seven fathoms and the course **N.** $\frac{1}{4}$ **W.** for the entrance, leading midway between the black buoy on Nonamesset Point Shoal and the red buoy on Great Ledge, and carrying not less than three and three-quarter fathoms. The **N.** $\frac{1}{4}$ **W.** course should be continued, carrying not less than fifteen feet water, until Nobska Point Light-house bears **E.** by **S.**, distant nearly three-quarters of a mile, and the bluff land on the southern extremity of Parker's Neck **E NE.**, distant a little over three hundred yards, when the depth will be fifteen feet and the course **NW.** $\frac{1}{4}$ **W.**, heading directly for the red spar-buoy on Red Ledge. Vessels must pass to the southward of this buoy close-to, and continue the course nearly for the southern extremity of Long Neck, passing to the northward of the black nun-buoy on the eastern end of Middle Ledge, and carrying not less than fifteen feet water, until the southern extremity of Parker's Neck bears **SE.** by **E.** $\frac{1}{2}$ **E.**, distant a little over half a mile, and the black nun-buoy on the eastern end of Middle Ledge is in range with Mink Point. The depth will now be eighteen feet and the course **W.** Southerly, passing to the northward of the black spar-buoy on the western end of Middle Ledge, leaving the horizontally-striped buoy on Hadley's Rock about an eighth of a mile to the southward, and carrying not less than fifteen feet water. Vessels must be careful to make this course good, so as to avoid the sunken rock which lies just to the northward of it. When Hadley's Rock buoy bears **S.** by **E.** $\frac{1}{4}$ **E.**, distant nearly an eighth of a mile, and the black spar-buoy on the western end of Middle Ledge is nearly in range with the red spar-buoy on Red Ledge, the depth will be five fathoms and the course **N.** by **W.** $\frac{1}{4}$ **W.**, passing to the westward of the red spar-buoy on Long Neck Rock and to the eastward of the black buoy on Naushon Point Shoal, and carrying not less than four and a quarter fathoms water. The bay is now open, and with the black spar-buoy on Naushon Point Shoal bearing **S.** by **W.** $\frac{1}{2}$ **W.**, in range with the eastern extremity of Uncatena Island, the depth will be five fathoms, and the course may be shaped **NW.** by **W.** $\frac{3}{4}$ **W.** for the entrance to New Bedford; **N.** by **W.** $\frac{3}{4}$ **W.** for Mattapoiset Harbor; **N.** $\frac{1}{8}$ **W.** for the entrance to Sippican; and **N.** $\frac{1}{2}$ **E.** to a position one and a quarter miles to the westward of Wing's Neck Light-house, and for the entrance to Wareham River.

The above courses pass about one mile to the eastward of Tarpaulin Cove Light-house; a little over three-eighths of a mile to the southward of Nobska Point Light-house; nearly one hundred yards to the westward of the red spar-buoy on Great Ledge; the same distance to the eastward of the black spar-buoy on Nonamesset Point Shoal; a little over an eighth of a mile to the southward and westward of the southern end of Parker's Neck; about twenty-five yards to the southward of the red spar-buoy on Red Ledge; nearly one hundred yards to the eastward of the black nun-buoy on the eastern end of Middle Ledge; one hundred yards to the southward of the southern end of Long Neck; nearly one hundred and fifty yards to the northward of the black spar-buoy on the western end of Middle Ledge; an eighth of a mile to the northward of the horizontally-striped buoy on Hadley's Rock; one hundred and fifty yards to the westward of the red spar-buoy on Long Neck Rock; and a little over an eighth of a mile to the northward and eastward of the black spar-buoy on Naushon Point Shoal.

Or, the N. $\frac{1}{4}$ W. course may be continued, passing well to the eastward of the red buoy on Red Ledge until up with the red spar-buoy on Parker's Flats, (which will be seen ahead,) passing it close-to. When about one hundred yards to the northward of this buoy, with the bluff of Wood's Hole bearing **NE.** by **E.** $\frac{1}{4}$ **E.**, vessels should steer **W.** Southerly, passing midway between Grassy Island (a small low island to the northward) and the spindle on the northern end of Red Ledge, carrying not less than eight feet water; after which, when up with the black nun-buoy on the eastern end of Middle Ledge, the directions given above should be followed. This passage, however, is rarely used.

Having come through the Channel between No Man's Land and Martha's Vineyard, to enter Wood's Hole.—When, on the **NE.** by **E.** course from off Gay Head Light-house, Tarpaulin Cove

Light-house bears **W. $\frac{1}{2}$ N.**, about two and a half miles distant, the depth will be eleven fathoms, and the course **NE. $\frac{1}{2}$ E.** for Nobska Point Light-house, carrying not less than seven fathoms water, until within a little over three-quarters of a mile of it; when **N. $\frac{1}{2}$ W.** should be steered for the entrance, following the directions given above.

On the above courses, to enter Great Harbor.—The **N. $\frac{1}{2}$ W.** course should be continued, passing to the westward of the red spar-buoy on Parker's Flats close-to, and carrying not less than fifteen feet water. When about one hundred yards to the northward of this buoy, and wishing to anchor off the village, the bluff of Wood's Hole must be steered for; or, desiring to enter the Inner Harbor, vessels should follow the directions given on page 147.

Or, wishing to enter Hadley's Harbor.—When, on the **W. Southerly** course from abreast of the black spar-buoy on the eastern end of Middle Ledge, the horizontally-striped buoy on Hadley's Rock bears **S. by E. $\frac{1}{2}$ E.**, distant a little over an eighth of a mile, **W SW.** should be steered, following the directions given for the harbor, on page 150.

LIGHT-HOUSE.

NAME.	Latitude.	Longitude West.		Fixed or Revolving.	Height above sea-level.	Distance visible in nautical miles.
		In arc.	In time.			
	° ' "	° ' "	h. m. s.		Feet.	
Nobska Point Light-house	41 30 55	70 39 19	4 42 37	Fixed.	89	13

TIDES.

	South Side.	North Side.
Corrected Establishment	8 ^h 34 ^m	7 ^h 59 ^m
Mean Rise and Fall of tides	1.65 ft.	4.01 ft.
Mean Rise and Fall of Spring tides	2.05 ft.	4.70 ft.
Mean Rise and Fall of Neap tides	1.23 ft.	3.14 ft.
Mean duration of Rise	5 ^h 17 ^m	6 ^h 51 ^m
Mean duration of Fall	7 ^h 10 ^m	5 ^h 31 ^m
Mean duration of Stand	59 ^m	38 ^m
Rise of highest tide observed	2.97 ft.	5.36 ft.

The duration of Rise and Fall is reckoned from the middle of one stand to the middle of the next.

CURRENTS.

No regular observations have as yet been made in this passage, but the current is known to run with great velocity;—a drift of as high as five miles an hour having been reported. Strangers should, therefore, be very careful to make good the courses given above; and should not attempt the passage without a pilot, unless in cases of emergency.

VARIATION OF THE COMPASS.

The magnetic variation at Nobska Point Light-house for 1880 is **10° 48' W.**, with an annual increase of **2 $\frac{1}{2}$ '**.

TARPAULIN COVE.

This excellent harbor of refuge lies nearly four miles to the westward of Wood's Hole and about four miles and a half to the eastward of Quick's Hole. It is formed by a semi-circular cove on the southern shore of Naushon Island, almost exactly midway between its eastern and western ends; and affords excellent anchorage, in from two to three fathoms, in northerly and northwesterly winds. It is, however, open to the eastward; and vessels should not attempt to anchor there in easterly gales, but should make Wood's Hole if possible, or pass through Quick's Hole and find shelter in Buzzard's Bay. The northeastern point of entrance to Tarpaulin Cove is a high, grassy head, with precipitous sea-face, and several large detached boulders at its base. The western point of entrance is of moderate height, bare and grassy, and has upon it a white light-tower, attached to the keeper's dwelling, also white. This is called Tarpaulin Cove Light-house. It is thirty-two feet high, showing a fixed white light, varied by flashes every half minute, from a height of eighty feet above the sea. It is of the fourth order of Fresnel, is visible fifteen miles, and its geographical position is

Latitude	41° 32' 8" N.	
Longitude	70° 45' 22" W.	
It bears from		Miles.
Nobska Point Light-house, W. by S. $\frac{1}{2}$ S.		5 $\frac{1}{2}$
West Chop Light-house, W. $\frac{1}{2}$ N.		7 $\frac{1}{2}$
Gay Head Light-house, NE. $\frac{1}{2}$ N.		nearly 8

The western shore of Tarpaulin Cove from the light-house to what is locally known as the **Store Wharf** is rocky, undulating, and nearly bare of trees; but beyond this, towards the head of the cove, it is low and sandy, faced by a white beach, and backed by a very thick growth of low bushy trees. From the head of the cove, along the northern shore to the eastern point of entrance, the land is of moderate height, somewhat steep and undulating, and strewn with boulders.

DANGERS

IN APPROACHING AND ENTERING TARPAULIN COVE.

I. *From the Eastward.*—There are a very few obstructions in this harbor, and vessels may enter it with safety by following the Sailing Directions. In coming from the eastward there are no dangers unless it is intended to anchor well up toward the head of the cove, when it becomes necessary to look out for a *sunken rock, with three feet at mean low water*, which lies a little over two hundred yards from the northern shore, bearing from the northeastern point **W. $\frac{3}{8}$ S.**, a little over a quarter of a mile; from the light-house **NE. by N. $\frac{3}{8}$ N.**, half a mile; and from the Store Wharf **NE. by E.**, about three-eighths of a mile distant. It is not buoyed, but is easily avoided by keeping nearly in the middle of the cove. When past this rock vessels must not stand farther towards the head of the cove than to bring the light-house to bear **S SW.**, to avoid Single Rock, *Single Rock.* another detached rock, with six feet at mean low water, which lies about an eighth of a mile from the western shore of the cove, bearing from the light-house **N. $\frac{1}{8}$ E.**, three-eighths of a mile, and from the Store Wharf **NE. $\frac{1}{2}$ N.**, about three hundred and seventy-five yards distant. A spar-buoy, painted red and black in horizontal stripes, is placed on its eastern side in ten feet water.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING TARPAULIN COVE.

I. *From the Eastward.*—On the **W. by S. $\frac{3}{8}$ S.** course through Vineyard Sound, when Nobska Point Light-house bears **NE. $\frac{1}{2}$ E.** and Tarpaulin Cove Light-house **W. $\frac{1}{2}$ N.**, with eleven fathoms water, **W. by N.** will lead safely to the anchorage. Large vessels should anchor in from five to five and a half fathoms, with Gay Head Light-house just open with the light-house point; but smaller vessels may continue the course **W. by N.**, carrying from fourteen to sixteen feet water, until within one hundred yards of the red and black spar-buoy on Single Rock, with the light-house bearing **S SW.**, on which bearing anchorage may be found in fourteen feet at low water either to the northward between Single Rock and the "three-foot rock" on the northern side of the harbor, or to the southward between Single Rock and the light-house point. The holding-ground is excellent, with soft, sticky bottom.

DANGERS

IN APPROACHING AND ENTERING TARPAULIN COVE.

II. *From the Westward.*—On approaching the light-house point from the westward, a black spar-buoy will be seen about four hundred yards to the eastward of the light-house. This is on Cove Rock, a detached rock, with five feet at low water, which bears from *Cove Rock.* the light-house **E. by N. $\frac{1}{4}$ N.**, four hundred yards, and from the Store Wharf **SE. by E.**, nearly six hundred yards distant. The buoy is placed in fifteen feet close to the rock, on its eastern side, is marked No. 1, and the course passes to the eastward of it; although vessels of light draught sometimes pass between it and the point through a narrow channel, with thirteen feet at mean low water. After passing Cove Rock the only dangers in Tarpaulin Cove are Single Rock and the three-foot rock off the northern shore, both of which have been described above.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING TARPAULIN COVE.

II. *From the Westward.*—On the course **E. by N. $\frac{3}{8}$ N.** from the westward, when Tarpaulin Cove Light-house bears **N. $\frac{1}{2}$ W.**, distant about a mile, there will be sixteen fathoms water, Nobska Point Light-house bearing **NE. by E. $\frac{1}{4}$ E.** and Gay Head Light-house **SW. $\frac{1}{4}$ S.** Thence the course is **N. by E. $\frac{1}{2}$ E.**, carrying not less than nine fathoms, until Tarpaulin Cove Light-house bears **W. $\frac{1}{2}$ N.**, about three-eighths of a mile distant, when the depth will be about eight and a half fathoms, and **NW.** will lead safely to the anchorage between Single Rock and the light-house point, or **NW. by N. $\frac{1}{4}$ N.** to that on the northern side of the cove, between Single Rock and the "three-foot rock." On the former course not less than fourteen feet will be found, care being taken not to stand to the west-

ward of the light-house bearing **S.** by **W.** $\frac{1}{2}$ **W.** On the **NW.** by **N.** $\frac{3}{4}$ **N.** course there will not be less than fifteen feet, with the light-house bearing **SSW.** But vessels of large draught should, when the light-house bears **W.** $\frac{1}{2}$ **N.**, as before, edge gradually to the westward, using the lead and anchoring when they strike five and a half fathoms, with Gay Head Light-house just open with the light-house point.

The **N.** by **E.** $\frac{1}{2}$ **E.** course passes three hundred and seventy-five yards to the eastward of the black buoy on Cove Rock; the **NW.** course for the southern anchorage passes one hundred and twenty-five yards to the northward of the buoy; and the **NW.** by **N.** $\frac{3}{4}$ **N.** course passes one-eighth of a mile to the northeastward of it, a little over two hundred yards to the eastward of Single Rock, and one hundred and seventy-five yards to the westward of the "three-foot rock" off the northern shore.

Having entered the Sound by the Channel between No Man's Land and Martha's Vineyard, and wishing to enter Tarpaulin Cove.—When, on the **NE.** by **E.** course through the Sound, Tarpaulin Cove Light-house bears **N.** $\frac{3}{4}$ **E.**, distant nearly two miles, the depth will be eleven fathoms, with Nobska Point Light-house bearing **NE.** $\frac{3}{4}$ **E.** and Gay Head Light-house **SW.** The course thence is **N.** by **E.** $\frac{1}{2}$ **E.**, with not less than nine fathoms, until Tarpaulin Cove Light-house bears **W.** $\frac{1}{2}$ **N.**, as before, when the directions given above for the harbor must be followed.

LIGHT-HOUSE.

NAME.	Latitude.	Longitude West.		Fixed or Revolving.	Interval of Flash.	Height above sea-level.	Distance visible in nautical miles.
		In arc.	In time.				
	° / "	° / "	h. m. s.		s.	Feet.	
Tarpaulin Cove Light-house	41 28 6	70 45 28	4 43 2	F. V. F.	30	80	15

TIDES.

Corrected Establishment	8 ⁿ 4 ^m
Mean Rise and Fall of tides	2.3 ft.
Mean Rise and Fall of Spring tides	2.8 ft.
Mean Rise and Fall of Neap tides	1.8 ft.
Mean duration of Rise	6 ⁿ 9 ^m
Mean duration of Fall	6 ⁿ 17 ^m
Mean duration of Stand	34 ^m
Rise of highest tide observed	4.6 ft.

The duration of Rise and Fall was reckoned from the middle of one stand to the middle of the next.

VARIATION OF THE COMPASS.

The magnetic variation at Tarpaulin Cove for 1880 is 10° 46' W., with an annual increase of 2 $\frac{1}{4}$ '.

QUICK'S HOLE.

This is not strictly speaking a harbor, although good shelter in southerly winds may be found by passing through it into Buzzard's Bay and anchoring under the northern shores of Nashawena or Pasque islands. It is a passage three-quarters of a mile wide, with from five to eight fathoms water, separating those two islands, and is well buoyed and therefore perfectly safe for strangers. The entrance bears **N.** $\frac{3}{4}$ **W.** from Gay Head Light-house, distant exactly five miles.

The eastern side of the entrance is formed by the western shore of Pasque Island, whose slightly modulating surface is covered only with grass and slopes somewhat steeply to the southward, showing low sand cliffs here and there. The eastern end of Nashawena forms the western side of the passage, and will appear, when seen from the southward, as a line of remarkable high water-worn sandy cliffs, with summits showing an undulating surface covered only with grass. From these cliffs the shore descends to the northward to a low sandy point faced with innumerable boulders, and near the northeastern end of the island there will be seen a cluster of three houses, which form prominent objects on the otherwise bare surface.

There is a strong current setting through Quick's Hole, and it is especially dangerous for vessels bound through the Sound to be caught close inshore in its vicinity, with a light wind and the tide setting through into Buzzard's Bay. In such a case, to avoid being carried through the passage, it is necessary to anchor and wait for a breeze or the turn of the tide.

DANGERS

IN APPROACHING AND ENTERING QUICK'S HOLE.

On approaching this passage from the eastward on the **NW.** $\frac{1}{2}$ **N.** course, there will be seen to the westward, bearing about **NW.** by **W.** $\frac{3}{4}$ **W.**, and a mile and an eighth distant, a black spar-buoy.



Florida New Journal

Off South Entrance to Quick's Hole, Gay Head L. In bearing S by W, distant 3/4 Miles.

This is on Nashawena Flats, which make off for a quarter of a mile in a southeasterly direction from the southeastern end of Nashawena Island. The buoy is marked No. 1, placed in three fathoms off their eastern point, and bears from Gay Head Light-house N. $\frac{1}{2}$ E., four miles and three-quarters distant. The course passes well of the buoy, and when abreast of it a red nun-buoy will be seen a little to the northward of the course, bearing about N. by W. $\frac{3}{4}$ W., and distant half a mile. This is on Quick's Hole Ledge, a mass of rocks and ledges making off from the western end of Pasque Island for about seven hundred yards, being in some places awash at low water and in others having from two to four feet upon them. The buoy is a nun of the third class, marked No. 2, and placed in fifteen feet water on the eastern point of the shoal.

Nashawena Flats.

Quick's Hole Ledge.

After passing the buoy on Quick's Hole Ledge the western shore of Pasque Island should not be approached nearer than five hundred yards, as it is quite foul. It would also be well to give the eastern end of Nashawena Island a berth to the westward of about three hundred and fifty yards after passing the buoy on Nashawena Flats.

When fairly through the passage a nun-buoy, painted red and black in horizontal stripes, will be seen to the westward of the course, bearing nearly NW. by N. $\frac{1}{2}$ N., and half a mile distant. This is on Lone Rock, a detached rock, with three feet at mean low water, which lies nearly three-quarters of a mile N. by E. $\frac{1}{2}$ E. from the northeastern point of Nashawena Island, leaving a channel between the buoy and the point eight hundred yards wide, with from five to eight fathoms water. The buoy is placed on the southern side of the ledge in five fathoms water, and bears from Dumpling Rock Light-house (at the western entrance to New Bedford) S. by E. $\frac{7}{8}$ E., five miles and a half, and from Clark's Point Light-house S. $\frac{1}{2}$ E. Nearly, about eight miles distant.

Lone Rock.

To avoid Lone Rock, Gay Head Light-house must be kept open to the eastward of the southeastern point of Nashawena Island.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING QUICK'S HOLE.

I. Coming from the Eastward and intending to pass through into Buzzard's Bay.—On the course W. by S. $\frac{3}{4}$ S. through Vineyard Sound, when Gay Head Light-house bears S. by W. $\frac{3}{4}$ W., Quick's Hole will be open, and NW. $\frac{1}{2}$ N. will lead safely in, with not less than five and three-quarter fathoms, until abreast of the red nun-buoy on Quick's Hole Ledge. When abreast of this buoy, in seven fathoms, Gay Head Light-house will bear S. $\frac{3}{4}$ W., and the course is N. $\frac{3}{4}$ E., keeping the light a little open to the eastward of the southeastern point of Nashawena to clear Lone Rock. This course, upon which there will not be less than four and a half fathoms water, should be continued until Dumpling Rock Light-house bears NW. by N. $\frac{1}{2}$ N., when Clark's Point Light-house will bear N. $\frac{1}{2}$ W. Westerly, and if bound for New Bedford by the East Channel, N. $\frac{1}{4}$ W. will lead safely up to abreast of Clark's Point Light-house, after which the directions for that harbor should be followed. If bound to Mattapoiset or up the bay, NE. $\frac{1}{2}$ N. should be steered, with not less than eight fathoms, until Clark's Point Light-house bears NW. by W. $\frac{1}{2}$ W. and is on with the southern extremity of Sconticut Neck, when a NE. course should be steered, following the directions for the bay.

The above courses pass three-eighths of a mile to the eastward of the black buoy on Nashawena Flats; two hundred and fifty yards to the westward of the red buoy on Quick's Hole Ledge; and four hundred yards to the eastward of Lone Rock.

Wishing to proceed to the Westward after passing through Quick's Hole.—When Dumpling Rock Light-house bears NW. by N. $\frac{1}{2}$ N. and Clark's Point Light-house N. $\frac{1}{2}$ W. Westerly, as before, W. $\frac{1}{4}$ S. will lead, with not less than five and a half fathoms, to abreast of Hen and Chickens Light-vessel, from which point W. $\frac{1}{2}$ S. will lead safely up to Point Judith.

II. Coming from the Westward, to pass through Quick's Hole into Buzzard's Bay.—On the course E. by N. $\frac{3}{4}$ N. from off Vineyard Sound Light-vessel, when Gay Head Light-house bears S. $\frac{1}{4}$ W. and Tarpaulin Cove Light-house NE. by E. $\frac{3}{4}$ E., the depth will be nine and a quarter fathoms, and the course N. by E. $\frac{7}{8}$ E. for a little over a mile will lead, with not less than six fathoms, to the black buoy on Nashawena Flats, passing to the eastward of it. When abreast of this buoy, the course is N. $\frac{3}{4}$ W. for three-quarters of a mile, which leads, with not less than five fathoms, to the red buoy on Quick's Hole Ledge, passing to the westward of it. Thence the course is N. $\frac{1}{4}$ E., with not less than five fathoms, until Dumpling Rock Light-house bears NW. by N. $\frac{1}{2}$ N. and Clark's Point Light-house N. $\frac{1}{2}$ W.

Westerly. Here the depth will be about nine fathoms, and **N. $\frac{1}{2}$ W.** will lead to the entrance to New Bedford; and **NE. $\frac{1}{2}$ N.** will lead up the bay.

The above courses pass three hundred yards to the eastward of the black buoy on Nashawena Flats; a little over one hundred yards to the westward of the red buoy on Quick's Hole Ledge; and four hundred yards to the eastward of Lone Rock.

Having come through the Channel between No Man's Land and Martha's Vineyard, to pass through Quick's Hole into Buzzard's Bay.—With Gay Head Light-house bearing **NE. by E.**, a little over a mile distant, the course is **N. $\frac{1}{2}$ E.** until the light-house bears **SE. $\frac{1}{2}$ S.**, when the depth will be ten fathoms, and **N. by E. $\frac{1}{2}$ E.** will lead, with not less than six fathoms, up to the black buoy on Nashawena Flats, passing to the eastward of it. When abreast of this buoy, the directions just given for passing through Quick's Hole from the westward should be followed.

TIDES.

	North Side.	South Side.
Corrected Establishment	7 ^h 31 ^m	7 ^h 36 ^m
Mean Rise and Fall of tides	3.7 ft.	3.1 ft.
Mean Rise and Fall of Spring tides	4.3 ft.	3.8 ft.
Mean Rise and Fall of Neap tides	2.9 ft.	2.3 ft.
Mean duration of Rise	6 ^h 31 ^m	6 ^h 29 ^m
Mean duration of Fall	5 ^h 54 ^m	5 ^h 55 ^m
Mean duration of Stand	39 ^m	40 ^m
Rise of highest tide observed	4.8 ft.	4.2 ft.

VARIATION OF THE COMPASS.

The magnetic variation at Quick's Hole for 1880 is **10° 43' W.**, with an annual increase of **2 $\frac{1}{2}$ '**.

NANTUCKET HARBOR.

This harbor lies on the northern shore of Nantucket Island, midway between its eastern and western ends. The entrance is between the western point of Coatue Beach (called Coatue Point) on the east and Brant Point on the west, and is three-eighths of a mile wide; but the available channel is much contracted by **Coatue Flats**. Nantucket Harbor proper lies at the entrance to a large shallow lagoon of very irregular shape, which runs in a nearly **NE.** direction for about five miles and a quarter,—the head of the lagoon being separated from the ocean by a mere strip of sand an eighth of a mile wide, forming part of the eastern shore of Nantucket Island. The town of **Nantucket** is built upon the western shore, at the entrance to the lagoon, just to the southward of Brant Point; and was in former times a place of considerable importance, owing to the number of vessels which fitted out here for the whale fishery. This branch of industry having failed, and the entrance being closed, moreover, to any but vessels of light draught, by numerous very dangerous shifting sand bars, the harbor has ceased to be of any commercial importance, and is never resorted to by strangers. Vessels may, however, make a good anchorage, in southerly gales, outside the bar, in from four to seven fathoms, sticky bottom; but no one, however light his draught, should attempt to enter the harbor without a pilot. Not more than four feet at low water can be taken across the bar at present; but strenuous efforts have been and are being made for the improvement of the channel, to which end careful physical surveys have been made, and much thought and study given to the subject by the State Harbor Commissioners. It is not improbable that an appropriation will be made by Government for carrying out the plans of the commissioners. At present the harbor is unfit for strangers; and although the numerous shoals are well buoyed, yet these buoys have to be moved so often, owing to the shifting character of the sands, that any intelligent description of them is impossible.

Coatue Point, the eastern point of entrance to the harbor, is a low, flat sand point forming the western extremity of a long sand beach, dotted here and there with a few trees, and called **Coatue Beach**. It extends in a nearly **SW.** direction from the eastern shore of Nantucket for nearly five miles, and is in no place over a quarter of a mile wide. The lagoon or inner harbor is contained between this beach and the mainland of Nantucket Island.

Brant Point, the western point of entrance, is a low, flat sand point, extending out from the cliffs, and is easily recognized by the light-house, which is built near its eastern end. The high perpendicular cliffs to the westward of it have a very remarkable appearance, and will enable any one to recognize the entrance to the harbor. When seen from the westward these cliffs hide all of the town, except the tops of some of the higher steeples; but seen from the northward, the thickly clustered houses will appear over the low land of Brant Point. **Brant Point Light-house** is a red brick tower, forty-two feet high, connected with the keeper's dwelling (which is also of brick) by a covered way. It shows a fixed white light, of the fourth order of Fresnel, from a height of forty-six feet above sea-level, visible twelve miles. Its geographical position is

Latitude	41° 17' 21" N.
Longitude	70° 5' 33" W.

Near the foot of the cliffs, and bearing from Brant Point Light-house **NW.** by **W. ½ W.**, will be seen two small pyramidal wooden structures, used as range beacons for approaching the bar, and called Nantucket Cliff Beacons. They are about one hundred yards apart in a **NE.** by **N. ¼ N.** and **SW.** by **S. ¼ S.** direction,—the front beacon showing a fixed white light from a height of eight feet above the sea, visible seven miles; and the rear beacon a fixed red light from a height of ten feet, also visible seven miles. The range of the Cliff Beacons will lead to a large bell-buoy,* painted black and white in perpendicular stripes, which is placed in three fathoms water, with the Cliff Beacons bearing **SW.** by **S. ½ S.** and Nantucket Light-house (Great Point) **NE.** by **N. ¼ N.**

Nantucket Cliff Beacons.

As before remarked, no intelligible description can be given of the dangers in approaching this harbor. The following directions will lead a vessel up to the bar.

SAILING DIRECTIONS

FOR APPROACHING NANTUCKET BAR.

Bring the Cliff Beacons in range and steer for them, passing near the bell-buoy in three fathoms water, and continue this course until up with the outer bar buoy, which is a red spar-buoy, with bush on top, bearing from Brant Point Light-house **N.** by **W.** Beyond this, and until up with Brant Point, vessels must be guided entirely by the buoys, which are constantly shifted as the bar changes. On passing Brant Point give it a berth of two hundred yards to the westward and steer **SW.** for the anchorage off the wharves, where there is from two to three fathoms, soft bottom.

LIGHT-HOUSES.

NAME.	Latitude.	Longitude West.			Fixed or Revolving.	Height above sea-level.	Distance visible in nautical miles.
		In arc.		In time.			
		° ' "	h. m. s.				
Brant Point Light-house	41 17 21	70 5 33	4 40 22	Fixed.	45	12	
Nantucket Cliff Beacons	41 17 36	70 6 23	4 40 26	Fixed.	8	7	
				Fixed red.	10	7	

TIDES.

Corrected Establishment	12 ^b 24 ^m
Mean Rise and Fall of tides	3.1 ft.
Mean Rise and Fall of Spring tides	3.6 ft.
Mean Rise and Fall of Neap tides	2.6 ft.
Mean duration of Rise	6 ^h 23 ^m
Mean duration of Fall	5 ^b 44 ^m
Mean duration of Stand	14 ^m
Rise of highest tide observed	5 ft.

CURRENTS.

LOCALITY.	First Quarter.		Second Quarter.		Third Quarter.		Fourth Quarter.		Flood or Ebb.
	Set.	Drift.	Set.	Drift.	Set.	Drift.	Set.	Drift.	
One mile and a quarter W. by N. from the bell-buoy.	NE. ½ E.	0.3	NE.	0.3	N.	0.3	W. ½ N.		Flood.
Two miles NW. from Brant Point Light-house.	NW. by W. ¼ W.		NW. by N.	0.3	N. by E. ¼ E.	0.3	NE. by E.		Ebb.

VARIATION OF THE COMPASS.

The magnetic variation at Nantucket for 1890 is 10° 55' W., with an annual increase of 2 ½'.

MATACUT HARBOR.

This is a small and shallow harbor formed by a cove making in on the western end of Nantucket Island. It is entirely unfit for strangers and for any vessels except those of the lightest draught. It is barred by flats, most of which are bare at low water, and is never used except by the small fishermen belonging there.

EDGARTOWN HARBOR.

This excellent harbor is contained between Chappaquiddick Island and the eastern end of Martha's Vineyard, and is formed by a deep indentation in the northern shore of the former. It is naturally divided into an **Outer** and **Inner Harbor**,—the former being contained between Chappaquiddick Island and the extensive flats which make off to the northward from the eastern end of Martha's Vineyard; and the latter being formed by a narrow, crooked, but deep passage leading between Chappaquiddick Island and the Vineyard into Cotamy Bay. The most prominent object in approaching Edgartown Harbor is Cape Poge Light-house, a white tower, thirty-six feet high, connected by a covered way with a one-story white house. It shows a fixed white light, of the fourth order of Fresnel, from a height of fifty-seven feet above the sea, visible thirteen miles. Its geographical position is

Latitude 41° 25' 14" N.
Longitude 70° 27' 5" W.,

and it bears from

	Miles.
Cross Rip Light-vessel, W. $\frac{1}{2}$ S.	7 $\frac{1}{2}$
Succoneset Shoal Light-vessel, S. by W. $\frac{1}{2}$ W.	6 $\frac{1}{2}$
Nobska Point Light-house, SE. $\frac{1}{2}$ E.	10 $\frac{1}{2}$
Nantucket Light-house, W. by N. $\frac{1}{2}$ N.	a little over 18

Cape Poge, upon which the light-house is built, is a bare, bluff, precipitous head, with sandy faces, and backed by sand hills and hillocks. It is the northern extremity of a long and narrow strip of sand beach which extends from **Cape Poge**. **Wasque Bluff** (the southeastern point of Chappaquiddick Island) N. by E., four miles, to the cape. Another narrow strip of sand extends to the southwestward and southward from the cape, nearly uniting at its southern end with a high, perpendicular, yellow bluff, called **North Neck**. The opening between this neck and the southern end of the sand is about one hundred yards wide, and leads into a broad but very shallow bay, called **Cape Poge Bay**, and sometimes **Cape Poge Pond**.

Chappaquiddick Island, the main body of which is somewhat triangular in shape, lies about N NW. and S SE. In this direction it is about two miles and three-quarters long, two and a quarter wide at its northern end, (between North Neck on the east and Chappaquiddick Point on the west,) and gradually contracts in width to less than three-quarters of a mile at its southeastern end. Its northern shore, which forms the southern side of Edgartown Outer Harbor, is composed of very gently sloping lands, cleared and cultivated, except on the summits, which are crowned with a thick growth of bushes and scrubby trees. **Chappaquiddick Point** is very long, low, flat and grassy, and extends to the northwestward from the base of a very remarkable grassy hill, with level summit, and steeply sloping faces covered thickly with grass. This is called **Chubby Bluff**, and sometimes **Yellow Bank**. The western and southwestern shores of the island are mostly high and steeply sloping, with occasional precipitous sand bluffs. They are mostly cleared and cultivated near the shore-line, with a background of thick woods.

That portion of the eastern end of Martha's Vineyard which forms the western shore of the Outer Harbor is called **Starbuck Neck**, and is composed entirely of low, level and grassy lands, destitute of trees, and showing occasional low sand cliffs. It is nearly all under cultivation, but the houses are some distance back from the shore. **Edgartown Light-house**. From its southeastern extremity, which is called **Starbuck Point**, extends a long wharf, upon the end of which stands a two-story white dwelling with light-house on top. This is Edgartown Light-house, a guide to the Inner Harbor,—the entrance to which is between this light-house and Chappaquiddick Point. The light is fixed white, of the fourth order, thirty-seven feet above the sea, visible eleven miles. Its geographical position is

Latitude 41° 23' 25" N.
Longitude 70° 30' 12" W.,

and it bears from Succoneset Shoal Light-vessel SW. by S. $\frac{1}{2}$ S., nine miles, and from Cape Poge Light-house SW. by W. $\frac{1}{2}$ W., distant two miles and seven-eighths.

On the southern side of Starbuck Point begins the village of **Edgartown**, which is built upon nearly level lands on the northern and western sides of the Inner Harbor. Here the passage turns abruptly to the southward, and runs between high and steeply sloping shores, with precipitous sand bluffs here and there, into Cotamy Bay. This passage varies in width from about two hundred yards, between Chappaquiddick Point and the village, to six hundred yards just below the latter, and again contracts to two hundred yards in width about three-quarters of a mile to the southward of Chappaquiddick Point. Below this point it gradually increases in width until it joins the bay.

Cotamy Bay is the large but shallow bay which formerly separated the Vineyard and Chappaquiddick Island; but the openings in the beach on its southern side, which once existed, have been closed for some years, and the two islands are now joined by a strip of sand beach having an average width of one hundred and fifty yards and called **Cotamy Beach**. It has been proposed by the Harbor Commissioners of Massachusetts to re-open a passage across this beach. Cotamy Bay is at present a mass of shoals, through which winds a narrow and very crooked channel with about nine feet at mean low water.

DANGERS

IN APPROACHING AND ENTERING EDGARTOWN HARBOR.

The entrance to this harbor is guarded by two black buoys,—one on the eastern and one on the western side. That on the eastern side is on the northern end of Cape Poge Flats, a mass of shoal ground surrounding the cape, extending to the northeastward three-quarters of a mile, the eastward five-eighths of a mile, and to the northward about three-eighths of a mile. Vessels of less draught than twelve feet may, however, cross the flats with safety within three-eighths of a mile of the light-house, as there is nothing less than ten feet at this distance. The buoy is marked No. 15, being painted and numbered for the Main South Channel of Vineyard Sound. It is placed in eighteen feet water on the northern end of the flats, and bears from

Cape Poge Flats.

	Miles.
Cape Poge Light-house, NE. by N. $\frac{1}{8}$ N. -----	$\frac{3}{4}$
Cross Rip Light-vessel, W. $\frac{1}{4}$ N. -----	$7\frac{1}{8}$
Black buoy on the Outer Flats, E. by S. -----	$2\frac{1}{8}$
Black can-buoy on the eastern end of Squash Meadow, SE. $\frac{3}{4}$ E. Southerly	$3\frac{1}{8}$
Nun-buoy on the eastern end of The Hedge Fence, SE. by S. $\frac{3}{4}$ S., a little over	$3\frac{1}{2}$

The black buoy on the western side of the entrance is on Outer Flats, the name given to the northernmost portion of the mass of ledges and flats extending from Starbuck Neck about N NE. for nearly two miles, and forming a natural breakwater to Edgartown Outer Harbor. On Outer Flats there is eight feet close to their northern end, with soundings of twelve and fifteen feet, hard, sandy bottom, all around it. The buoy is a can* of the second class, painted black, marked No. 17, and placed in three fathoms a little to the northeastward of the light-foot spot. It is colored and numbered as one of the regular guides for the South or Main Channel of Vineyard Sound, and bears from

Outer Flats.

	Miles.
Cross Rip Light-vessel, W. $\frac{1}{2}$ N. -----	$9\frac{1}{8}$
Black buoy on Cape Poge Flats, W. by N. -----	$2\frac{1}{2}$
Succonesset Shoal Light-vessel, SW. by S. Southerly -----	$6\frac{1}{2}$
Black buoy on the eastern end of Squash Meadow, S. by E. $\frac{1}{4}$ E. -----	$1\frac{1}{8}$
Black spar-buoy off East Chop, SE. $\frac{3}{8}$ S. -----	$3\frac{1}{8}$

When between these two buoys at the entrance, another black spar-buoy will be seen to the southward and about half a mile off. This is on Stony Point Flats, forming the western extremity of the shoal ground, which, farther to the eastward, is known as Cape Poge Flats. It makes off from Stony Point, (which is five-eighths of a mile to the westward of Cape Poge Light-house,) and has from ten to twelve feet upon it five hundred yards from shore. The buoy is marked No. 1, placed in eighteen feet on the western side of the flats, and bears from

Stony Point Flats.

	Miles.
Cape Poge Light-house, W. by N. $\frac{1}{4}$ N. ----- nearly	1
The black buoy on Cape Poge Flats, W. by S. $\frac{1}{2}$ S. -----	$1\frac{1}{4}$
The black can-buoy on Outer Flats, SE. -----	$1\frac{1}{8}$

In this buoy Edgartown Light-house bears SW. $\frac{1}{4}$ W., a little over two miles and a quarter distant. On the western side of the channel, nearly opposite to Stony Point buoy, and about five-eighths of a mile to the southward of the black can-buoy on Outer Flats, there will be seen another black spar-buoy. This is on Allen's Rock, one of the detached rocks lying in the mass of shoal ground making off N NE. from Starbuck Neck. It has five feet at mean low water and from twelve to fifteen feet on all sides of it. The buoy is marked No. 2, placed close to it on the southern side, and bears from

Allen's Rock.

	Miles.
Cape Poge Light-house, W. by N. $\frac{1}{4}$ N. -----	$1\frac{1}{8}$
The black buoy on Cape Poge Flats, W. $\frac{1}{2}$ S. -----	$2\frac{1}{4}$
The black can-buoy on Outer Flats, S. by W. $\frac{3}{8}$ W. -----	$\frac{5}{8}$

About three hundred and fifty yards to the southwestward of the buoy on Allen's Rock will be another red spar-buoy with bush on top. This is on Hatsett's Rock, another detached rock, with four feet at mean low water, which lies about a quarter of a mile from Allen's Rock, and is surrounded by other sunken rocks with from

Hatsett's Rock.

five to eight feet at low water. The buoy is marked No. 4, placed in twelve feet water on the northern side of the rock, and bears from

	Miles.
The black can-buoy on Outer Flats, SW. by S. $\frac{1}{2}$ S.-----	$2\frac{3}{4}$
The black spar-buoy on Cape Poge Flats, W. $\frac{1}{2}$ S.-----	nearly $2\frac{1}{2}$
Cape Poge Light-house, W. by N.-----	2

When abreast of the black spar-buoy on Stony Point Flats there will be seen to the westward of the course, bearing SW. by W. $\frac{1}{8}$ W., about seven-eighths of a mile distant, another red spar-buoy. This is on Mill Rock, another of the detached rocks on the flats off Starbuck Point, having four feet at mean low water. The buoy is placed on the eastern side of the rock, in two fathoms, is marked No. 6, and bears from

	Miles.
The buoy on Allen's Rock, S. by W.-----	$\frac{1}{2}$
Black can-buoy on Outer Flats, S. by W. $\frac{1}{4}$ W.-----	1
Black buoy on Stony Point Flats, W. by S.-----	a little over 1
Cape Poge Light-house, W.-----	nearly 2

To avoid this and the other rocks on these flats vessels should not stand to the westward of Edgartown Light-house bearing SW. by S.

About three-eighths of a mile to the westward of the buoy on Mill Rock there will be seen an iron spindle, with cask on top, painted red. This is on Spindle Rock, a small detached rock, awash at high water, lying on the flats about one mile and an eighth SW. by S. $\frac{1}{4}$ S. from the black buoy on Outer Flats. It is not in the way of vessels bound either in or out of this harbor.

When nearly abreast of the red buoy on Mill Rock another red spar-buoy will be seen to the westward of the course, and nearly half a mile off, bearing about SW. $\frac{1}{4}$ W. This is on Middle Flats. Middle Flats, the name given to the eastern portion of the shoal ground NE. of Starbuck Neck. The shoalest water near the buoy is ten feet, and the buoy itself is placed in three fathoms on the eastern side of the flats, to mark the western side of the channel. It is marked No. 8, and bears from the red buoy on Mill Rock S. by E. $\frac{1}{2}$ E., half a mile, and from Edgartown Light-house NE. $\frac{1}{4}$ N., a mile and an eighth distant.

When up with the buoy on Middle Flats a black spar-buoy will appear well to the eastward of the course and nearly five-eighths of a mile off, bearing about S. $\frac{3}{4}$ E. This is on the northwestern side of Sturgeon Flats, which make off from the southeastern side of the harbor in the vicinity of the cliffs on North Neck, and have from eight to ten feet water upon them. The buoy is placed in eighteen feet about an eighth of a mile to the northward of the flats, and bears from Edgartown Light-house E. $\frac{1}{4}$ N., nearly a mile, and from the black buoy on Stony Point Flats SW. by S. $\frac{3}{4}$ S., one mile and five-eighths distant. To avoid these flats when in their vicinity vessels should not stand to the southward of Edgartown Light-house bearing W. by S. $\frac{1}{8}$ S.

On approaching the light-house a red spar-buoy will be seen on the western side of the channel and a quarter of a mile to the eastward of the light-house. This is on Light-house Point Flats, or Starbuck Point Flats, as they are sometimes called. They make off from Starbuck Point, (forming the foundation upon which the light-house wharf is built,) and are nearly bare at low water for over an eighth of a mile from shore. From nine to eleven feet is found between the light-house and the buoy. The buoy, which is marked No. 10, is placed in sixteen feet water a quarter of a mile SE. by E. $\frac{1}{4}$ E. from the light-house, and bears from the black buoy on Sturgeon Flats W. by S. $\frac{3}{4}$ S., distant three-quarters of a mile. The sailing-line for the Inner Harbor passes close around to the eastward and then to the northward of this buoy.

On coming abreast of the town a black spar-buoy will be seen to the southward and about a quarter of a mile off. This is on Chappaquiddick Flats, which make off from Chappaquiddick Point with four feet at mean low water. The buoy is marked No. 5, and is intended to mark the eastern boundary of the channel where it turns abruptly to the southward. It is about one hundred and twenty yards from Chappaquiddick Point, and the sailing-line passes to the westward of it.

About a quarter of a mile to the southward of the buoy on Chappaquiddick Flats, and six hundred yards below Chappaquiddick Point, will be seen another black spar-buoy nearly in the middle of the passage. This is on The Middle Ground,—a dangerous shoal, with four feet at mean low water, with a good channel of not less than three fathoms on its western side and a thirteen feet slue to the eastward of it. The buoy is marked No. 7, and is placed in two fathoms water on the southwestern end of the spit.

Beyond The Middle Ground no intelligible description of the dangers can be given.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING EDGARTOWN HARBOR.

I. From the Eastward, having come through the Middle Channel of Nantucket Sound.—On the course **NW.** by **W.** $\frac{1}{4}$ **W.** from Cross Rip Light-vessel, when Cape Poge Light-house bears **SW.** $\frac{1}{4}$ **W.**, distant a little over four miles, Succonesset Shoal Light-vessel **N.** by **W.** $\frac{1}{2}$ **W.**, distant three miles and seven-eighths, the depth will be nine fathoms, and **SW.** by **W.** $\frac{1}{2}$ **W.** will lead, with not less than six and a half fathoms, to the entrance to the harbor. On this course, when Cape Poge Light-house bears **SE.** by **E.** $\frac{3}{8}$ **E.**, a mile and an eighth distant, and Edgartown Light-house **SW.** $\frac{3}{8}$ **S.**, the depth will be five fathoms, and **SW.** by **S.** will lead, with not less than four fathoms, up to the red buoy on Light-house Point Flats. When past the range of this buoy and the light-house, with the latter bearing **NW.** by **W.** $\frac{1}{4}$ **W.** and a little over six hundred yards off, **W.** by **N.** $\frac{1}{8}$ **N.** should be steered towards the village, heading about for the upper wharf. This course will carry not less than fifteen feet at low water, and good anchorage will be found upon it anywhere between the buoy on Light-house Point Flats and the town; or it may be continued until within about sixty yards of the wharf-line, when the course may be changed to the south-westward, keeping about the same distance from the wharves and giving Chappaquiddick Point a berth of about one hundred yards, when good anchorage will be found, in from two to four and a half fathoms, anywhere between the point and the lower wharves of the village. This is an excellent harbor, and comparatively easy of access.

The above courses pass over half a mile to the northwestward of the black buoy on Cape Poge Flats; three-quarters of a mile to the eastward of the black can-buoy on Outer Flats; a quarter of a mile to the westward of the black spar-buoy on Stony Point Flats; five-eighths of a mile to the eastward of Allen's Rock buoy; three-quarters of a mile to the eastward of Hatsett's Rock buoy; half a mile to the eastward of the red buoy on Mill Rock; three-eighths of a mile to the westward of the black buoy on Sturgeon Flats; about two hundred and seventy-five yards to the eastward of the red buoy on The Middle Ground; and one hundred and fifty yards to the eastward, and the same distance to the southward, of the red buoy on Light-house Point Flats.

Having come through the South or Main Channel of Nantucket Sound, to enter Edgartown Harbor.—On the course **W.** by **N.** $\frac{5}{8}$ **N.** from Cross Rip Light-vessel, when Cape Poge Light-house bears **SW.** $\frac{1}{4}$ **S.**, two miles and three-quarters distant, the depth will be ten fathoms, and the course **SW.** by **W.** $\frac{1}{2}$ **W.** for the entrance to the harbor, carrying not less than six and a half fathoms. On this course, when Cape Poge Light-house bears **SE.** by **E.** $\frac{3}{8}$ **E.**, a mile and an eighth distant, as before, the depth will be five fathoms, and **SW.** by **S.** will lead safely into the harbor, following the directions given above.

Or, from Cross Rip Light-vessel, W. $\frac{1}{4}$ N. should be steered, carrying not less than four and a half fathoms, until Cape Poge Light-house bears **S.** by **W.** $\frac{1}{4}$ **W.**, a mile and a quarter distant, when the depth will be six and a half fathoms and the course **SW.** by **W.** $\frac{1}{2}$ **W.** for a mile and a half, or until Cape Poge Light-house bears **SE.** by **E.** $\frac{3}{8}$ **E.**, as before. On this course there will not be less than five fathoms, and, from the above bearing of the light-house, **SW.** by **S.** will lead safely into the harbor, following the directions previously given.

II. Having come through the Middle Channel of Nantucket Sound from the Westward, between L'Homme Dieu Shoal and The Hedge Fence, to enter Edgartown Harbor.—On the course **E.** by **S.** $\frac{1}{2}$ **S.** from off Nobska Point Light-house, when between the black buoy on the eastern end of L'Homme Dieu Shoal and the striped buoy on the eastern end of The Hedge Fence, with Cross Rip Light-vessel bearing **SE.** by **E.** $\frac{1}{4}$ **E.** and Cape Poge Light-house **S.** $\frac{3}{4}$ **E.**, the depth will be ten fathoms, and the course **S.** $\frac{3}{4}$ **E.** for the light-house, until Holmes' Hole Light-house bears **W.** by **N.** $\frac{5}{8}$ **N.**, when the depth will be nine fathoms, and the course **S.** by **W.** $\frac{1}{4}$ **W.**, carrying not less than six fathoms, until Cape Poge Light-house bears **SE.** by **E.** $\frac{3}{8}$ **E.**, when **SW.** by **S.** will lead safely into the harbor, following the directions previously given.

The above courses pass half a mile to the eastward of the red and black buoy on the eastern end of The Hedge Fence; about a mile and a quarter to the westward of the black buoy on Cape Poge Flats; and three-quarters of a mile to the eastward of the black buoy on Outer Flats.

Having come through the South or Main Channel of Nantucket Sound from the Westward, to enter Edgartown Harbor.—On the course **SE. by E.** from off Nobska Point Light-house, when Cape Poge Light-house bears **SE. by S.**, four miles and a quarter distant, Holmes' Hole Light-house **W. by N. $\frac{3}{8}$ N.**, three miles and three-quarters distant, and Succonesset Shoal Light-vessel **NE. $\frac{3}{8}$ E.**, a little over five miles distant, the depth will be ten fathoms, and the course **SE. by S.** for Cape Poge Light-house, carrying not less than four and three-quarter fathoms, until Holmes' Hole Light-house bears **NW. by W. $\frac{3}{8}$ W.**, open a little to the northward of Oak Bluffs or East Chop. The depth will be seven fathoms, and the course **S. by E. $\frac{1}{2}$ E.**, carrying not less than four and a half fathoms, until Cape Poge Light-house bears **SE. by E. $\frac{3}{8}$ E.**, when **SW. by S.** will lead safely into the harbor, as before.

To come through between East Chop and Squash Meadow Shoal from the Westward, and enter Edgartown Harbor.—On the course **SE. by E.** from off Nobska Point Light-house, when Holmes' Hole Light-house bears **W. Southerly**, a mile and five-eighths distant, the depth will be twelve fathoms, and **S. by E. $\frac{3}{8}$ E.** will lead, with not less than four fathoms, between the black spar-buoy on East Chop Flats and the black nun-buoy on the western end of Squash Meadow. On this course, when Cape Poge Light-house bears **SE. $\frac{1}{4}$ E.** it should be steered for, carrying not less than five fathoms, until Edgartown Light-house bears **SSW.**, when the black can-buoy on Outer Flats will be nearly abeam and about three-eighths of a mile off. The depth here will be five and a quarter fathoms. From this point the course is **S. Easterly** until Edgartown Light-house bears **SW.**, carrying not less than four fathoms. Cape Poge Light-house will now bear **E. $\frac{1}{2}$ N.**, and **SW. by S.** will lead into the harbor, as before.

The above courses pass three-eighths of a mile to the eastward of the black spar-buoy on East Chop Flats; a quarter of a mile to the southward of the black nun-buoy on the western end of Squash Meadow; three-eighths of a mile to the northward of Schoolship Rock; a little over half a mile to the northward of Little Rock; five-eighths of a mile to the northward of Lone Rock; half a mile to the southward of the black can-buoy on the eastern end of Squash Meadow; seven hundred yards to the northward, and three hundred and fifty yards to the eastward, of the black can-buoy on Outer Flats; three-eighths of a mile to the eastward of the red buoy on Allen's Rock; five-eighths of a mile to the westward of the black spar-buoy on Stony Point Flats; half a mile to the eastward of Hatsett's Rock; and the same distance to the eastward of the red buoy on Mill Rock.

This channel is used by those only who are well acquainted with the shoals.

LIGHT-HOUSES.

NAME.	Latitude.	Longitude West.			Fixed or Revolving.	Height above sea-level.	Distance visible in nautical miles.
		In arc.		In time.			
	° ' "	° ' "	h. m. s.			Fect.	
Cape Poge Light-house	41 25 14	70 27 5	4 41 48			57	13
Edgartown Light-house	41 23 25	70 30 12	4 42 1			37	11

TIDES.

Corrected Establishment	12 ^h 16 ^m
Mean Rise and Fall of tides	2.0 ft.
Mean Rise and Fall of Spring tides	2.5 ft.
Mean Rise and Fall of Neap tides	1.6 ft.
Mean duration of Rise	6 ^h 51 ^m
Mean duration of Fall	5 ^h 29 ^m
Rise of highest tide observed	3.4 ft.

VARIATION OF THE COMPASS.

The magnetic variation at Edgartown for 1880 is 10° 46' W., with an annual increase of 2 $\frac{1}{4}$ ' nearly.

VINEYARD HAVEN, OR HOLMES' HOLE.

Nearly six miles **NW. $\frac{1}{4}$ W.** from Cape Poge is East Chop, the eastern point of entrance to Vineyard Haven, or Holmes' Hole,—a wide and deep indentation in the northern shore of Martha's Vineyard, affording good shelter from southerly or westerly winds in from three to five fathoms water, soft bottom. The bight or cove forming the harbor of Vineyard Haven is about

mile and a half long in a SW. direction, and a little over a mile and a half wide at its mouth, between East Chop and Low Point. It gradually contracts in width towards its head,—being less than a quarter of a mile wide abreast of the village. It is open to northerly and northeasterly winds, and at such times forms a very uncomfortable anchorage. It is, however, much resorted to by coasters in thick or heavy weather.

East Chop, the eastern point of entrance to this harbor, is a high bluff head, with nearly level surface and precipitous sandy faces,—the summit being thickly covered with houses, forming part of the village of Eastville, or what is now known as Oak Bluff Settlement. A prominent object among these houses is a tall square tower of open work, surmounted by a flag-staff, and standing about a quarter of a mile to the southward of the extremity of the point. This is the Telegraph Station. Another prominent object is a white tower with a dwelling of the same color a little to the southeastward of it. This tower is known as East Chop Light-house, and shows a fixed red light of the fourth order, from a height of seventy-nine feet above the sea, visible fourteen and a half miles. Its geographical position is

Latitude ----- 41° 28' 11" N.
Longitude ----- 70° 34' 4" W.,

and it bears from

	Miles.
Cross Rip Light-vessel, W. by N. $\frac{1}{2}$ N.	12 $\frac{1}{2}$
Succonesset Shoal Light-vessel, W SW.	nearly 7 $\frac{1}{2}$
The striped buoy on the eastern end of The Hedge Fence, W. Southerly	nearly 3 $\frac{1}{2}$
The black buoy on the western end of Squash Meadow, NW. by W. $\frac{1}{4}$ W.	1 $\frac{1}{2}$

From this light-house

	Miles.
The striped buoy on the western end of The Hedge Fence bears N. by E.	1 $\frac{1}{4}$
Nobska Point Light-house NW.	4 $\frac{1}{2}$
West Chop Light-house NW. by W. $\frac{1}{2}$ W.	a little over 1 $\frac{1}{2}$

The eastern shore of Vineyard Haven from East Chop to the entrance to Lagoon Pond,—a little over a mile below,—is of moderate height, very gently sloping, dotted with houses, and the summits at intervals crowned with trees.

West Chop, the western point of entrance to Vineyard Haven, is low, sandy, and somewhat undulating, covered with grass, backed by a thick growth of low trees, and shows perpendicular faces to the northward. To the eastward (that is, towards the entrance to the harbor) it extends into a long, flat, sandy point, called Low Point; and midway between this and the pitch of the chop is built the light-house, which is the guide to the harbor. This is called West Chop, or Holmes' Hole Light-house, and appears as a white tower, connected with a dwelling-house of the same color by a covered way. It stands about one hundred yards back from the beach, is surrounded by bushes, and shows a fixed white light, of the fourth order of Fresnel, from a height of sixty-nine feet above the sea, visible thirteen miles. Its geographical position is

Latitude ----- 41° 28' 49" N.
Longitude ----- 70° 36' 0" W.,

and it bears from

	Miles.
Tarpaulin Cove Light-house, E. $\frac{1}{2}$ S.	7 $\frac{1}{2}$
Nobska Point Light-house, SE. $\frac{1}{2}$ S.	3 $\frac{1}{2}$
The horizontally-striped buoy on the western end of The Hedge Fence, SW. by W. $\frac{1}{2}$ W.	nearly 2
The horizontally-striped buoy on the eastern end of The Hedge Fence, W. $\frac{1}{4}$ N.	3 $\frac{1}{2}$
The black buoy on the western end of Squash Meadow, NW. by W. $\frac{1}{2}$ W.	3 $\frac{1}{2}$
Cape Poge Light-house, NW. $\frac{1}{4}$ W. Westerly	7 $\frac{1}{2}$

The western shore of Vineyard Haven, from Low Point, runs about S. by W. for a little over five-eighths of a mile to Hudson's Head. The land is of moderate height, with sandy perpendicular faces, and is cleared and cultivated near the shore-line, but backed by thick woods. Hudson's Head is a high, bluff, sandy head, with precipitous faces and nearly level summit, crowned with a group of houses and backed by thick woods. There are two long wharves here, extending beyond the low-water line. From Hudson's Head the western shore of Vineyard Haven runs about S SW. for seven-eighths of a mile to the head of the harbor,—the land being undulating and diversified with beautifully cleared slopes, handsome groves of trees, and ornamental grounds. The village of Holmes' Hole is situated on this western shore, at the head of the harbor, off which there is good anchorage in from two to three fathoms, soft bottom.

Lagoon Pond is a long and narrow lagoon running nearly SW. from the southeastern side of the harbor for about two miles, and has in it from two to four fathoms at low water, but is barred at its mouth by what are called Canal Flats, which are nearly bare at low water. The entrance to the lagoon is a little over one hundred yards wide, and is crossed by a bridge. It is separated from Vineyard Haven by a long and narrow strip of low sand beach, partly covered with grass, which extends from the village in about an E NE. direction to the entrance of the lagoon.

In coming into the harbor, there will be seen over the low land at the head of the bight a grassy head of moderate height, in some places covered with a thick growth of scrubby trees and in others dotted with low trees, interspersed with low grass lands. This is Little Neck, a prominent point on the western side of Lagoon Pond. There was, in 1874, a large and handsome house on the summit of the neck, which was a notable object in coming into the harbor.

DANGERS

IN APPROACHING AND ENTERING VINEYARD HAVEN.

I. *From the Eastward, by the Main or South Channel of Nantucket Sound.*—Having come through the Main Channel, and intending to anchor in Vineyard Haven, it is usual to continue the course for Holmes' Hole Light-house until the harbor is fairly open. On this course, when about a mile from East Chop there will be seen a little to the southward of the course, bearing *East Chop Flats*. about $W. \frac{1}{4} S.$, and distant five-eighths of a mile, a black spar-buoy. This is on East Chop Flats, which make off from East Chop for nearly a quarter of a mile with from nine to eleven feet water. The buoy is marked No. 23, placed in eighteen feet water off the northeastern end of the flats, and bears from

	Miles.
The red and black buoy on the eastern end of The Hedge Fence, $W.$, a little over	3
The black buoy on the western end of Squash Meadow, $NW. \frac{1}{8} W.$ -----	$1 \frac{3}{8}$
The northern extremity of East Chop, $E. \frac{1}{4} S.$ -----nearly	$1 \frac{1}{2}$
Holmes' Hole Light-house, $SE.$ by $E. \frac{1}{4} E.$ -----	$1 \frac{3}{4}$

It is numbered for the Main Channel of Nantucket Sound.

In beating into the harbor vessels should not approach Low Point nearer than a quarter of a mile to avoid Low Point Flats, which make off from that point to the eastward for about *Low Point Flats*. three hundred yards. On these flats there are numerous small detached rocks, some awash at low water and others with from one to five feet upon them. A red can-buoy* of the second class has been placed in three fathoms water off their eastern end, three-eighths of a mile from shore. This buoy is marked No. 2, and bears from

	Miles.
The black buoy on East Chop Flats, $NW.$ by $W. \frac{3}{8} W.$ -----a little over	$1 \frac{1}{2}$
East Chop, $NW. \frac{1}{2} W.$ -----nearly	$1 \frac{1}{4}$
Low Point, $NE.$ by $E. \frac{3}{4} E.$ -----a little over	400 yds.
Holmes' Hole Light-house, $E. \frac{1}{4} S.$ -----about	650 "

Dangerous rocks, some awash at low water and some with from one to four feet upon them, lie off the western shore below Low Point, extending as far to the southward as five hundred yards below this buoy; and this part of the shore should not be approached nearer than a quarter of a mile. Beyond these rocks there are no dangers in the harbor,—it being only necessary to use the lead, and go about in from two and a half to three fathoms, according to draught, (as the water shoals

Canal Flats. gradually on both sides,) until near the head of the harbor and off the entrance to Lagoon Pond, when a black spar-buoy will be seen to the southward nearly in range with the middle of the bridge. This is off the northern end of Canal Flats, which make off from the sandy shore on both sides of the lagoon entrance to a distance of over three hundred yards and have from two and a half to four feet water upon them. Here the soundings diminish rapidly from three fathoms to five feet in a space of fifty yards, and care should be taken not to get inside the buoy, which is placed in two fathoms water close to the northern end of the flats. It is marked No. 1, and bears from

	Miles.
The red buoy on Low Point Flats, $S. \frac{1}{8} W.$ -----	$1 \frac{1}{4}$
The wharf at Hudson's Head, $SE.$ by $S. \frac{1}{4} S.$ -----a little over	$1 \frac{1}{2}$
The village wharf, $E.$ by $N. \frac{1}{8} N.$ -----	$\frac{5}{8}$

To avoid Canal Flats, if the buoy is not seen, vessels should not stand to the eastward of the wharf on the long sand-spit opposite the village, bearing $SW. \frac{1}{8} W.$

When abreast of the black buoy on Canal Flats a red spar-buoy will appear to the westward of the course, bearing about $SW.$ by $W.$, and distant three-eighths of a mile. This is on *Harbor Flats.* Harbor Flats, which have from three to eight feet water upon them, and make off from the western shore, abreast of the village, for a quarter of a mile. The buoy is marked No. 4, is placed in thirteen feet at mean low water, and bears from

	Mile.
The wharf at Hudson's Head, $S. \frac{1}{8} W.$ -----about	$\frac{3}{8}$
The black buoy on Canal Flats, $W.$ by $S. \frac{1}{2} S.$ -----	$\frac{1}{2}$
The village or steamboat wharf, $NE.$ by $E. \frac{1}{2} E.$ -----	$\frac{1}{4}$

There is good anchorage, in from two and a half to three fathoms, to the southward of this buoy, and between the steamboat wharf and the wharf on the sand-spit opposite to the village.



West Chop
L.L.H.

Between them

Entrance to Vineyard Haven, West Chop L.L.H. bearing S. W. by W. distant 1 Mile.

East Chop
L.L.H.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING VINEYARD HAVEN.

I. From the Eastward, by the South or Main Channel of Nantucket Sound.—On the **W.** by **N.** $\frac{3}{4}$ **N.** course for Holmes' Hole Light-house, when East Chop bears **S.** $\frac{3}{4}$ **E.**, a little over nine hundred yards distant, and the steamboat wharf at the village **SW.** $\frac{3}{4}$ **W.**, the depth will be eight fathoms, and **SW.** $\frac{1}{2}$ **W.** will lead safely into the harbor, carrying not less than three and a half fathoms, until nearly up with the red buoy on Harbor Flats. When within three hundred yards of this buoy, in twenty feet water, the wharf on the sand-spit opposite the village will bear **SW.** by **S.**, and that course will lead, with not less than twenty feet, to good anchorage within about one hundred and fifty yards of the wharf. *Or*, vessels may, when within one hundred and fifty yards of the wharf, as before, haul over towards the steamboat wharf, and anchor in from twelve to fifteen feet abreast of the village. *Or*, anchorage may be found anywhere on the **SW.** $\frac{1}{2}$ **W.** course after passing Hudson's Head.

The above courses pass four hundred yards to the northward of the black buoy on East Chop Flats; three hundred yards to the northwestward of the black buoy on Canal Flats; and one hundred yards to the eastward of the red buoy on Harbor Flats.

Coming from the Westward by the Main Channel, to enter Vineyard Haven.—On the course **E.** by **N.** $\frac{3}{4}$ **N.** through Vineyard Sound, when Nobska Point Light-house bears **NW.** by **W.**, a mile and a half, and Holmes' Hole Light-house **SSE.**, a mile and seven-eighths distant, the depth will be eleven fathoms, and the course **SE.** $\frac{1}{4}$ **S.**, carrying not less than ten fathoms, until Holmes' Hole Light-house bears **W.** by **S.** $\frac{1}{4}$ **S.**, five-eighths of a mile distant; when the depth will be ten fathoms, and the course **S.** by **W.** into the harbor, carrying not less than three and a half fathoms, and steering nearly for the black buoy on Canal Flats. Anchorage may be found anywhere on this course after passing Hudson's Head wharf; *or*, when within about four hundred and fifty yards of the buoy on Canal Flats, with the red buoy on Harbor Flats bearing **SW.** $\frac{1}{2}$ **W.**, the steamboat wharf at the village **SW.** $\frac{3}{4}$ **W.**, and the wharf on the sand-spit at the head of the harbor **SW.** $\frac{1}{2}$ **S.**, the course is **SW.** $\frac{1}{4}$ **S.**, on which anchorage is found anywhere to the southward of Harbor Flats buoy in from three to three and a half fathoms, *or* between the two wharves in from two to two and a half fathoms.

The above courses pass seven hundred yards to the eastward of the red buoy on Low Point Flats; an eighth of a mile to the westward of the black buoy on Canal Flats; and a little over one hundred and fifty yards to the eastward of the red buoy on Harbor Flats.

DANGERS

IN APPROACHING AND ENTERING VINEYARD HAVEN.

II. From the Eastward, by the Channel between Squash Meadow Shoal and East Chop.—This passage is not used by strangers, but only by steamers and those sailing-vessels whose masters are well acquainted with this part of the coast. The rule is to bring Cape Poge Light-house to bear **SE.** $\frac{1}{4}$ **E.** and steer **NW.** $\frac{1}{4}$ **W.**, on which course, when past the black buoy on Outer Flats, (off Edgartown,) there will be seen well to the northward of the course, bearing about **N.** by **W.**, seven-eighths of a mile off, a black can-buoy.* This is on a *small detached shoal* lying off the eastern end of Squash Meadow Shoal and having sixteen feet water upon it. Squash Meadow Shoal lies on the southern side of the Main Channel and has ten feet at low water. The main shoal runs **NW.** by **W.** and **SE.** by **E.** and is a little over three-quarters of a mile long, but the detached shoal spots at its eastern and western ends increase the whole length a mile and a quarter. Its average width is about three hundred yards; the bottom is of hard sand, and the shoal is equally bold-to on both sides. The can-buoy on its eastern end bears from the black buoy on the northern end of Cape Poge Flats **NW.** $\frac{3}{4}$ **W.**, a little over three miles, and from the black buoy on the northern end of Outer Flats **N.** by **W.** $\frac{1}{4}$ **W.**, one mile and a half distant. From the buoy

	Miles.
The black buoy on Lone Rock bears W. $\frac{1}{4}$ N. -----	1 $\frac{7}{8}$
Oak Bluff Wharf W. by N. $\frac{1}{4}$ N. ----- a little over	2
Schoolship Rock W. by N. $\frac{1}{2}$ N. -----	2
East Chop NW. by W. $\frac{1}{2}$ W. ----- nearly	2 $\frac{3}{4}$
Black buoy on East Chop Flats NW. by W. -----	2 $\frac{3}{8}$
Holmes' Hole Light-house NW. by W. $\frac{1}{4}$ W. -----	4 $\frac{3}{8}$
Black nun-buoy* on the western end of Squash Meadow NW. by W. -----	1 $\frac{1}{4}$

When past the eastern end of Squash Meadow the buoy on the western end will be seen to the northward of the course and about a mile off. This is a black nun* of the second class, marked No. 21, and placed in four fathoms a little to the westward of the detached shoal lying off the western end. It bears from

	Miles.
The black buoy on Cape Poge Flats, NW. $\frac{3}{4}$ W. Westerly -----	4 $\frac{3}{8}$
Cape Poge Light-house, NW. Northerly -----	4 $\frac{2}{8}$
The black buoy on the northern end of Outer Flats, NW. by N. a little over	2 $\frac{1}{2}$

East Chop bears from this buoy NW. by W. $\frac{3}{4}$ W., one mile and three-eighths; Holmes' Hole Light-house NW. by W. $\frac{1}{3}$ W., three miles and an eighth; and the black buoy off East Chop Flats NW. $\frac{1}{2}$ W., one mile and three-eighths distant.

On the western side of the passage it is necessary to look out for Lone Rock, which is marked by a black spar-buoy (No. 1). It is a small detached rock, with five feet water, lying about four hundred yards from the shore of Martha's Vineyard. The buoy is placed on its eastern side, and bears from the black can-buoy on the eastern end of the Squash Meadow W. $\frac{1}{4}$ N., a mile and seven-eighths, and from Oak Bluff wharf SE. by S. $\frac{3}{4}$ S., nearly half a mile distant.

About six hundred and fifty yards NW. by N. $\frac{3}{4}$ N. from the buoy on Lone Rock, and close in with Oak Bluff wharf, lies *Little Rock*, a small detached rock, with one foot at low water and one hundred yards from shore. Vessels bound to Vineyard Haven pay no attention to it.

About nine hundred yards N. $\frac{1}{2}$ W. from the black buoy on Lone Rock there is another sunken rock, called *Schoolship Rock*. It has eleven feet at mean low water, is marked by a spar-buoy painted red and black in horizontal stripes, and bears from the black nun-buoy on the western end of Squash Meadow Shoal W. $\frac{1}{2}$ S., seven-eighths of a mile, and from the black buoy on East Chop Flats S. by E. $\frac{1}{2}$ E., about the same distance.

To avoid it (should the buoy be gone) vessels should not approach the shore in its vicinity nearer than nine hundred yards.

When past the buoy on the western end of Squash Meadow the black spar-buoy on East Chop Flats will be seen nearly ahead and about three-quarters of a mile off. These flats make off from

East Chop for a quarter of a mile in an E NE. direction, and have from ten to eleven feet at a distance of a quarter of a mile from shore. The buoy is a black spar, marked No. 23, and placed in three fathoms off the eastern edge of the shoal. It bears from the black nun-buoy on the western end of Squash Meadow NW. $\frac{1}{3}$ W., one mile and three-eighths, and from Holmes' Hole Light-house SE. by E. $\frac{3}{4}$ E., a mile and three-quarters distant. When past this buoy the harbor will soon be opened, and the dangers are the same as those described in coming from the eastward by the Main or South Channel. (See page 166.)

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING VINEYARD HAVEN.

II. *From the Eastward, by the Channel between Squash Meadow Shoal and East Chop.*—The course W. $\frac{1}{2}$ N. from Cross Rip Light-vessel should be continued past the entrance to Edgartown Harbor, and until Cape Poge Light-house bears SE. $\frac{1}{4}$ E., when the depth will be five and a quarter fathoms, and NW. $\frac{1}{4}$ W. will lead, with not less than six fathoms, up to the western end of Squash Meadow. When the black nun-buoy on the western end of this shoal is abeam, bearing NE. $\frac{1}{4}$ N., and a quarter of a mile off, the depth will be six and three-quarter fathoms, and the course NW. by N., with not less than four and a quarter fathoms, for a little over a mile and a quarter, until Holmes' Hole Light-house bears W. by N. $\frac{3}{8}$ N., distant one mile and seven-eighths, when that course must be steered for nearly three-quarters of a mile, until East Chop bears S. $\frac{3}{4}$ E. and the steamboat wharf at the village SW. $\frac{3}{8}$ W., when the depth will be eight fathoms, and SW. $\frac{1}{2}$ W. will lead safely into the harbor, following the directions previously given.

The above courses pass nearly half a mile to the southward of the black can-buoy on the eastern end of Squash Meadow; three-quarters of a mile to the eastward of the black spar-buoy on Lone Rock; a quarter of a mile to the westward of the black nun-buoy on the western end of Squash Meadow; nearly three-quarters of a mile to the eastward of *Little Rock*; half a mile to the eastward of *Schoolship Rock*; a quarter of a mile to the eastward, and four hundred yards to the northward, of the black spar-buoy on East Chop Flats.

DANGERS

IN APPROACHING AND ENTERING VINEYARD HAVEN.

III. *From the Westward, by the Passage between The Middle Ground and West Chop.*—This passage, although it has not less than four fathoms water, is not recommended to strangers. It is extremely narrow at its eastern end,—the entire width of the passage between West Chop and the buoy on the eastern end of The Middle Ground being less than a quarter of a mile and the available channel only about two hundred yards wide. It may be entered either by keeping the shore of the Vineyard close aboard, passing to the eastward of Lucas' Shoal, and thence between The Middle Ground and the northern shore of the Vineyard to West Chop; or, by passing from the Main Channel between Lucas' Shoal and The Middle Ground, and thence close inshore to the eastward.

In coming in by the former passage, when about five miles and a half to the northeastward of Gay Head Light-house there will be seen to the northward of the course, and about three-quarters of a mile off, on a bearing of NE. by N. $\frac{1}{2}$ N., a can-buoy,* painted **Lucas' Shoal.** red and black in horizontal stripes. This is on Lucas' Shoal, a detached shoal, with fourteen feet at mean low water, lying in an E. by N. $\frac{1}{2}$ N. and W. by S. $\frac{1}{2}$ S. direction, and about a quarter of a mile long. The centre of the shoal bears from

	Miles.
Vineyard Sound Light-vessel, E. $\frac{1}{4}$ N. -----	11 $\frac{1}{2}$
Gay Head Light-house, NE. $\frac{3}{4}$ E. -----	6 $\frac{3}{4}$
Tarpaulin Cove Light-house, S. $\frac{3}{4}$ E. -----	2 $\frac{1}{2}$
Holmes' Hole Light-house, W. by S. $\frac{1}{2}$ S. -----	nearly 7

To avoid it vessels should not stand to the westward of Gay Head Light-house bearing SW. by W. The buoy is a can of the second class, and is placed close to the shoalest water on the southwestern side of the shoal.

When past Lucas' Shoal it is not safe to approach Cedar Tree Neck nearer than six hundred yards on account of Norton's Rock, a detached rock, with nine feet at mean low water, lying two hundred and fifty yards from the shore. It is not buoyed, but is **Norton's Rock.** easily avoided by keeping a little over a quarter of a mile from shore when abreast of Cedar Tree Neck; or by not going to the eastward of Nobska Point Light-house bearing NE. $\frac{3}{4}$ N.

When past Norton's Rock, there will be seen to the northward of the course, and about three-quarters of a mile off, a nun-buoy,* painted red and black in horizontal stripes. This is on the western end of The Middle Ground, a long and very narrow shoal, extending in an E. by N. and W. by S. direction for four miles and a half,—its eastern end being abreast of **The Middle Ground.** West Chop. The buoy on the western end is on the westernmost of a group of detached shoals having from nine to fifteen feet upon them; and five-eighths of a mile to the eastward of the buoy the shoal is crossed by a slue six hundred yards wide, with not less than three and a quarter fathoms. From the eastern side of this slue the soundings on the shoal vary from nine to twelve feet for half a mile to the eastward, at which point begins another slue channel, a mile and a quarter wide, with not less than thirteen feet at low water. The shoal may be safely crossed through this channel by bringing Nobska Point Light-house to bear N NE. and steering S SW. From the eastern side of this slue channel the soundings on the shoal vary from two to ten feet to its eastern end, where is a can-buoy* of the second class, also painted red and black in horizontal stripes, placed in three and a half fathoms close to the shoal.

The nun-buoy on the western end of The Middle Ground bears from

	Miles.
Gay Head Light-house, NE. $\frac{3}{4}$ E. -----	8 $\frac{3}{4}$
The striped can-buoy on Lucas' Shoal, NE. by E. -----	2 $\frac{1}{2}$
Tarpaulin Cove Light-house, SE. by E. $\frac{1}{4}$ E. -----	2 $\frac{3}{4}$
The can-buoy on the eastern end of the shoal, W. $\frac{1}{2}$ S. -----	4 $\frac{1}{2}$
Holmes' Hole Light-house, W. $\frac{3}{4}$ S. -----	4 $\frac{3}{4}$

The can-buoy on the eastern end of The Middle Ground bears from

	Miles.
Holmes' Hole Light-House, NW. -----	nearly $\frac{1}{2}$
Nobska Point Light-house, SE. $\frac{1}{4}$ S. -----	2 $\frac{3}{4}$
The black buoy on the western end of L'Homme Dieu Shoal, SW. -----	2 $\frac{1}{2}$
The red and black buoy on the western end of The Hedge Fence, W. by S. $\frac{1}{2}$ S. -----	a little over 2
Cross Rip Light-vessel, W. by N. $\frac{1}{4}$ N. -----	14 $\frac{1}{2}$
Tarpaulin Cove Light-house, E. $\frac{3}{4}$ S. -----	6 $\frac{3}{4}$
The buoy on the western end of the shoal, E. $\frac{1}{2}$ N. -----	4 $\frac{1}{2}$

When past the buoy on the eastern end of The Middle Ground the course continues to the eastward until the harbor is open, the dangers in which have been already described on page 166.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING VINEYARD HAVEN.

III. *From the Westward, by the Passage between The Middle Ground and West Chop.*—With Vineyard Sound Light-vessel bearing **NW. $\frac{3}{4}$ W.**, distant nearly two miles, the depth will be about twelve fathoms, and the course **E.** for about eight miles, carrying not less than eleven fathoms, until Tarpaulin Cove Light-house bears **N. by E. $\frac{3}{8}$ E.**, four miles and a quarter distant, and Gay Head Light-house **SW. by W.**, nearly four miles distant. The depth will be eleven and a half fathoms, and the course **NE. by E.**, with Gay Head Light-house over the stern, and carrying not less than eleven fathoms water. On this course, when abreast of Paul's Point, with Tarpaulin Cove Light-house bearing **NW. by W. $\frac{1}{8}$ W.**, the depth will be eleven fathoms, and the course **E. by N. $\frac{1}{2}$ N.** will lead safely through the passage with not less than four fathoms water. When past the buoy on the eastern end of The Middle Ground, the course must be continued to the eastward until Holmes' Hole Light-house bears **SW. by S.**, a little over half a mile distant, and Nobska Point Light-house **NW. $\frac{1}{4}$ W.** The depth will be ten and three-quarter fathoms and the course **SE. $\frac{1}{4}$ E.** for three-eighths of a mile, or until Holmes' Hole Light-house bears **W. by S. $\frac{1}{4}$ S.**, when **S. by W.** will lead safely into the harbor, following the directions given on page 167.

The above courses pass a little over three-eighths of a mile to the eastward of Lucas' Shoal; the same distance to the southward of the nun-buoy on the western end of The Middle Ground; three-eighths of a mile to the westward of Norton's Rock; one hundred yards to the southward of the can-buoy on the eastern end of The Middle Ground; three-eighths of a mile to the northward, and a quarter of a mile to the eastward, of the red buoy on Low Point Flats.

LIGHT-HOUSES.

NAME.	Latitude.	Longitude West.			Fixed or Revolving.	Height above sea-level.	Distance visible in nautical miles.
		In arc.		In time.			
	° ' "	° ' "	h. m. s.			Feet.	
Holmes' Hole or West Chop Light-house	41 28 49	70 36 0	4	42	24	69	13
East Chop Light-house	41 28 11	70 34 4	4	42	16	79	14 $\frac{1}{2}$

TIDES.

Corrected Establishment	11 ^h 43 ^m
Mean Rise and Fall of tides	1.7 ft.
Mean Rise and Fall of Spring tides	1.8 ft.
Mean Rise and Fall of Neap tides	1.3 ft.
Mean duration of Rise	6 ^h 41 ^m
Mean duration of Fall	5 ^h 21 ^m
Mean duration of Stand	0 ^h 12 ^m
Rise of highest tide observed	3.1 ft.

VARIATION OF THE COMPASS.

The magnetic variation at Vineyard Haven for 1880 is 10° 45' W., with an annual increase of 2 $\frac{1}{2}$ ' nearly.

CURRENTS ON MONOMOY SHOALS AND IN NANTUCKET AND VINEYARD SOUNDS.

Perhaps there is no subject connected with the navigation of this much-used thoroughfare of so great importance to coasters as the direction and velocity of the tidal currents. Especially is this the case at the eastern entrance, where currents of considerable velocity but variable set are met with, and where much delay and hindrance is caused by ignorance of the direction of the currents and their times of change.

Investigations, covering the extent of the Sounds from Monomoy Point to Gay Head, and also including the shoals to the southeastward of Nantucket Island, have been made at different times by the United States Coast Survey, and their results given to the public through the annual "Reports of the Superintendent." These investigations have been conducted mainly by

CURRENTS IN NANTUCKET AND VINEYARD SOUNDS.

Professor Henry Mitchell, Assistant in the Coast Survey, from whose observations the following data have been obtained and are here presented in tabular form, together with Professor Mitchell's explanatory remarks:

TABLE FOR CALCULATING THE TIMES OF CHANGE IN DIRECTION OF TIDAL CURRENT.

LOCALITY.	Time of turning after Moon's Transit.	Set.	Drift.	Time of turning after Moon's Transit.	Set.	Drift.
	To Flood.*			To Ebb.†		
	h. m.			h. m.		
Main Channel—Vineyard Sound, (Gay Head to West Chop.)	5 52	ENE.	1.4	12 3	WSW.	
Between West Chop and Nobska Point Light-house	5 36	E. ½ N.	1.7	11 52	W. ½ S.	1.7
South Channel—Abreast of The Hedge Fence	5 20	SE. by E.	1.3	11 50	NW. by W.	1.0
Between L'Homme Dieu and The Hedge Fence	5 13	E. ½ S.	1.5	11 51	W. by N.	1.8
Between L'Homme Dieu and the Falmouth Shore	4 19		0.9	10 51		0.9
North Channel—From Succonesset Light-vessel to Bishop and Clerk's Shoal.	4 24		1.0	10 45		0.9
Middle Channel—South of Bishop and Clerk's	4 34			11 5	W.	0.8
Cross Rip Light-vessel	5 13	ENE.	0.7	11 43	WNW.	0.6
Off Great Point, (Nantucket)	4 42	ENE.	1.0	10 36	W. by S.	0.6
From Handkerchief Light-vessel, three miles to the westward.	3 27	E. by N. ½ N.	0.9	10 13	W. ½ S.	0.7
Butler's Hole, near Shovelful Light-vessel	2 43	ENE.	1.2	9 16	WSW.	1.6
Near Broken Part of Pollock Rip	2 40	NE. ½ E.	1.2	8 59	SW.	1.4
MUSKEGET CHANNEL.						
A mile and a half SE. by E. from Cape Poge Light-house.	4 0	N. ½ E.	0.9	10 12	SW.	0.8
Near Skiff's Island	5 7			10 56	SW.	3.2

From Professor Mitchell's observations on the current at its maximum the following results have also been obtained, and may be relied on as accurate, the observations having been made when the influence of the wind was small. Sixteen stations were occupied, but the results of only fourteen are given below, sufficient data for the others not having been obtained. Of course all bearings are magnetic, and the velocity in "knots" or nautical miles per hour.

TABLE OF DIRECTIONS AND VELOCITIES AT MAXIMUM FLOOD AND EBB.

LOCALITY.	Maximum.			Third Quarter.		Flood or Ebb.
	Time after Moon's Transit.	Set.	Drift.	Set.	Drift.	
	h. m.					
Main Channel—Gay Head to West Chop	8 48	ENE.	1.3	ENE.	1.2	Flood.
	2 49	W. by S. ½ S.	1.9	W. by S.	1.2	Ebb.
Between West Chop and Nobska Point Light-house	8 36	E. ½ N.	2.5	E. ½ N.	1.7	Flood.
	2 32	W. ½ S.	2.5	W. ½ S.	1.5	Ebb.
South Channel—Abreast of The Hedge Fence	8 42	ESE.	2.1	SE. by E.	1.4	Flood.
	2 16	NW. ½ W.	1.5	NW. ½ W.	1.0	Ebb.
Between L'Homme Dieu and The Hedge Fence	8 9	E. by S.	2.1	E. by S.	1.0	Flood.
	2 17	W. by N.	2.2	WNW.	1.2	Ebb.
Between L'Homme Dieu and the Falmouth Shore	7 33	E. by S.	1.8	E. by S.	0.7	Flood.
		W.	1.6	W. ½ S.	0.9	Ebb.
North Channel—From Succonesset Light-vessel to Bishop and Clerk's Shoal.	7 41		1.4		0.8	Flood.
			0.9		0.6	Ebb.
Middle Channel—South of Bishop and Clerk's	1 21	W.	0.9	WSW.	0.6	Ebb.
Cross Rip Light-vessel	8 30	E. by N. ½ N.	1.2	E. by N. ½ N.	0.7	Flood.
	2 27	WNW.	0.9	WNW.	0.6	Ebb.
Off Great Point, (Nantucket)	7 00	ENE.	1.2	ENE.		Flood.
	0 56	W.	1.2	W.	0.8	Ebb.
From Handkerchief Light-vessel, three miles to the westward.	7 4	E. by S.	1.5	ESE.	0.9	Flood.
	0 26	W.	1.4	W. ½ N.	1.0	Ebb.
Butler's Hole—Near Shovelful Light-vessel	6 5	ENE.	1.8	ENE.	1.3	Flood.
	0 9	WSW.	2.3	SW. by W.	1.3	Ebb.
Near Broken Part of Pollock Rip	6 8	NE. by E. ½ E.	1.5	E. ½ S.	1.2	Flood.
	-0.33†	W. by S.	1.9	W.	1.3	Ebb.
MUSKEGET CHANNEL.						
A mile and a half SE. by E. from Cape Poge Light-house.	6 42	N. by E.	1.3	N. by E.	0.7	Flood.
	0 48	SW. by S. ½ S.	1.1	SW. by S. ½ S.	0.7	Ebb.
		NNE.	3.4	NE.	1.8	Flood.
Near Skiff's Island		SW.	3.2	SW.	2.5	Ebb.

* From W. to E.

† From E. to W.

‡ Before transit.

Currents--Nantucket and Vineyard Sounds. In the above tables the navigator has furnished him not only the direction and velocity of both ebb and flood currents, but also the times of change in the direction of the current, referred to the time of the moon's passage of the meridian. From these data he will have little difficulty in so arranging his time of traversing the Sounds as to complete the passage in the shortest possible time.

The direction of the current at the time of its greatest velocity being nearly parallel to the shore line, presents an exception to the general rule of the flood current running inland and perpendicular to the shore. But it is natural that a strong in-draught should take place in a thoroughfare between the mainland and such large islands as Nantucket and Martha's Vineyard. One would expect, therefore, that the flood would set to the eastward and the ebb to the westward, as is the case.

In the tables "the interval of time between the transit of the moon and maximum velocity (Table II) will be found more reliable than that for the turning of the current, because less affected by the daily inequalities of the tides and the prevailing winds.

"If the navigator is possessed of the 'Tide Tables for the Atlantic Coast,' (issued annually by the U. S. Coast Survey,) in which the tides of Boston are predicted for every day in the year, he will find the following rules for the ebb current convenient:

I. "Approaching Nantucket Sound from the eastward, the current begins to run southwesterly from Pollock Rip down through Butler's Hole about an hour and a half **before** the time of high water at Boston; or, westerly, through the South Channel, past Nantucket Great Point, three-quarters of an hour **before** the time of high water at Boston.

II. "In the channel northward of the 'Horse-Shoe' the westerly current begins about twenty-two minutes **before**, and in the South Channel near Cross Rip, thirteen minutes **after**, the time of high water at Boston.

III. "In the channel between 'L'Homme Dieu' and the Falmouth shore the westerly current begins ten minutes **before**; in the Middle Channel, between 'L'Homme Dieu' and the 'Hedge Fence,' twenty-five minutes **after**; and in the South Channel, between the 'Hedge Fence' and the Vineyard shore, a half hour **after** the time of high water at Boston.

IV. "At the junction of Nantucket and Vineyard sounds (between West Chop and Nobska Point) the westerly current begins thirteen minutes **after** the time of high water at Boston.

V. "There is little difference in time from point to point through the central channel of Vineyard Sound, where the westerly current begins about nineteen minutes **after** the time of high water at Boston.

VI. "In Muskeget Channel the current begins to run to the southward from a half hour to an hour **before** the time of high water at Boston.

"As no predictions are given for the times of low water at Boston, no such rules as the above can be given for the flood current; but the duration of the ebb current can be estimated at five hours and fifty minutes, subject to a variation sometimes as great as half an hour either way.

"I apply the term 'ebb' to the westerly, and the term 'flood' to the easterly drifts, in accordance with the popular usage among the coasters through these Sounds.

"The averages given in the tables do not correspond with what would be the averages of the rules referring to the Boston Tides; but the discrepancies are not important."*

At and near Pollock Rip the current sets all around the compass during twelve hours without any slack water, and turns from left to right like the hands of a watch;—or, in other words, from N. around by E., S., and W., to N. again. That portion of it which sets from N. to S. by way of E. is called the **Eastern Current**; and that which sets from S. to N. by way of W. is called the **Western Current**. The general features are as follows: The current of ebb commences a short time before high-water stand on the shore of Nantucket, and runs a little to the eastward of S., with no slack water. It then gradually attains its greatest velocity in a westerly and southerly direction (see Tables); after which the tidal current slackens—the least velocity being about one-fourth of the greatest—and runs a little to the westward of N., and then in an opposite direction to that of ebb,—thus completing an entire circuit.

Mr. George Eldridge, of Chatham, has published a very useful series of Current Tables for the Sounds, which meet the wants of coasters, perhaps, better than any other Tables that have been compiled up to the present date. His observations extend over a period of more than twenty years, and from them we obtain the following information, which will be of great service in crossing the shoals:

I. Off the eastern shore of Cape Cod the tide turns much sooner inshore than offshore. Vessels beating to the southward, and bound through Nantucket Sound, may, therefore, when abreast of Chatham Bar, take advantage of the current three hours before it turns westerly at Pollock Rip Light-vessel by keeping inshore. The current offshore sets strongly to the southward during northerly winds, from abreast of Chatham Bar to the northern end of Cape Cod; and vessels bound to the northward should therefore make short tacks, keeping inshore.

II. When about three and a half miles to the eastward of Chatham Light-houses, the current turns easterly and westerly at an average time of two hours and five minutes before the time of turn at Pollock Rip Light-vessel. At Handkerchief Light-vessel it turns forty-five minutes later than at Pollock Rip; at Cross Rip Light-vessel, one hour later than at The Handkerchief; and abreast of West Chop, forty-five minutes later than at Cross Rip. It is evident from this that the slack-water line travels from Chatham to West Chop—a distance of nearly thirty-nine nautical miles—in four hours and thirty-five minutes; or, in other words, the current turns E. and W. off West Chop four hours and thirty-five minutes later than off Chatham.

* Prof. Mitchell's paper on the "Tides and Currents of Nantucket and Vineyard Sounds."

III. The current turns easterly and westerly midway between Nashawena Island and Gay Head at an average period of forty-five minutes earlier than it turns in the Main Channel off West Chop, and about the same time that it turns at Cross Rip.

A vessel bound through Vineyard Sound by the Main Channel, taking her departure from Chatham Light-houses bearing **WNW.**, three and a half miles distant, on the first part of the westerly current, and moving through the water at an average speed of three and three-quarter miles an hour, would keep the favorable current from Chatham to Gay Head,—a distance of fifty-three nautical miles.

On the other hand, should a vessel bound to the eastward by the Main Channel take her departure from Gay Head Light-house bearing **S.**, on the first part of the easterly current, she would have to sail at the rate of nine and a half miles an hour in order to keep the favorable current to Pollock Rip Light-vessel,—a distance of forty-six nautical miles; or, in other words, she would hold the tide with her four hours and fifteen minutes.

IV. The current turns easterly at Pollock Rip Light-vessel about two and a half hours earlier than at West Chop. So, should a vessel take her departure from Pollock Rip Light-vessel on the first part of the westerly current, and pass through Butler's Hole into the Main Channel at the rate of two and one-third miles an hour, she would carry the current with her to West Chop,—a distance of a little over thirty-two nautical miles.

On the other hand, should a vessel take her departure from West Chop on the first part of the easterly current, she would have to go at the rate of eight miles an hour to keep the favorable current to Pollock Rip Light-vessel.

V. The current turns easterly and westerly much sooner near West Chop than in the South or Main channel. Vessels from the westward, with westerly winds, and beating around West Chop, on the last part of the eastern current should, therefore, keep nearest to The Hedge Fence until they are sure they can fetch into the Haven. Vessels from Vineyard Haven, bound to the westward with **SW.** winds, will obtain a favorable current an hour earlier than in the Main Channel by keeping nearest to West Chop and the buoy on the eastern end of The Middle Ground.

VI. The current turns easterly and westerly into Vineyard Sound, near The Devil's Bridge, more than an hour earlier than in mid-channel. Vessels from the westward, therefore, bound through the Sounds, with the wind from **E.** to **ENE.**, can get a favorable current an hour and a half earlier than in the Main Channel by keeping near the Gay Head shore.

The Tide Tables published annually by the U. S. Coast Survey give the times and heights of high water, with the duration of ebb and flood at Chatham, Monomoy, Great Point, Bass River, Hyannis, Vineyard Haven, Wood's Hole, Nobska Point, Menemsha Bight, Cuttyhunk, and other places in the Sounds.

ICE AND ITS EFFECTS IN NANTUCKET AND VINEYARD SOUNDS.

Mariners are warned to keep in mind the fact that not only the buoys, but even the light-vessels, in these Sounds are liable to be carried by the ice from their proper positions; and that they must not be blindly depended upon. Navigation of this region is always more or less unsafe during the winter months, owing to the strength of the tidal currents and the danger from drift-ice; and strangers should on no account attempt to pass through without a pilot.

Ice formations in the Sounds are mostly drift-ice, composed of masses torn by the winds and tides from the small bays and sheltered places on the northern shore. These accumulate in the shape of large floes, rendering the movements of sailing-vessels extremely hazardous. As a rule this drift-ice is not very troublesome before the first of January, or after the middle of March; although exceptions occur—as in very severe winters. Steam-vessels, especially powerful propellers, though delayed by the ice, are generally able to force a passage; but sailing-vessels run a great risk,—as, if once entangled in a large floe, they will invariably be carried by it on to the shoals and suffer great damage if not total destruction. In mild winters (such as those of 1870, 1871, 1872 and 1873-4) the ice forms but little obstacle to navigation; but in such winters as that of 1874-5, or that of 1856-7, it opposes an almost complete barrier to the progress of sailing-vessels—notably so during 1875, when it closed the Sounds to such vessels from January 15th until the early part of March.

The floes usually drift backwards and forwards in the channels with the tides, unless the wind is strong enough to overcome the strength of the currents; in which case, with a **NW.** wind part of the ice is driven out of the Sounds to the eastward, passing to the northward of Great Point; while another part passes out through Muskeget Channel. Of the remainder a large portion lodges in the bights on the northern shores of Nantucket and Martha's Vineyard, (such as the approaches to Nantucket Harbor and Edgartown,) where it remains as field-ice, increasing in extent and thickness until the wind shifts to the southward, when it becomes dislodged and drifts out again into the channel, or is forced upon the northern shores of the Sounds,—to repeat, with a northerly wind, the former programme.

Northeasterly winds have nearly the same influence on the movements of the floes as those from **NW.**, except that they force a small portion of the ice out through Vineyard Sound to the westward, instead of passing out around Great Point. For local formations (which always occur on the northern shores of the Sounds) the most favorable winds are those from **N.** to **W.** Easterly winds cause a swell, whereby the field-ice is broken up into small pieces and soon disappears.

It is stated, on the excellent authority of Captain Gibbs, of the U. S. Light-house Tender "Verbena," that a passage through the Sounds can almost always be effected by taking the North Channel (see pages 89-104) from Handkerchief Light-vessel to the northward of Bishop and Clerk's Light-house, and thence to Succoneet Light-vessel and Nobska Point. The exceptional cases are when, after a very cold period, strong **NE.** or southerly winds occur; when there would be great danger from drifting ice. Even during the winter of 1874-5 there were, in his opinion, but few days when this channel was not comparatively safe. This immunity from ice-obstructions is due to the fact that the prevailing **NW.** winds of winter keep this channel more free from ice than any other part of the Sounds.

Nantucket Harbor.—This harbor is closed by the ice during four out of every five winters, for periods of a few days at a time. In the severe winter of 1857 it was shut up from January 6th to February 3d; and in 1875, from January 16th to March 1st; at which latter date a channel was cut through the pack so that the steamer plying between Nantucket and Wood's Hole could resume her regular trips. Except in this narrow passage, however, the ice continued until the 10th of March, when it broke up and finally disappeared.

Inside of Brant Point the ice is usually a local formation; while outside, it is composed of drift-ice lodged by the NW. winds (as before mentioned) in masses on this shore. Here it "packs" across the entrance, and forms a solid barrier to ingress or egress until a change of wind or warmer weather breaks it up. In 1875 this mass of ice became so thick that it grounded at the entrance to the harbor and extended in a solid body as far out as a line from Great Point to Eel Pond.

The tidal current, if not opposed by northerly winds, has a tendency to prevent extensive formations of ice; but the prevailing NW. winds, as a rule, overcome any influence the current may have, and, forcing in drift-ice, close the entrance; after which the ice soon forms inside.

Edgartown Harbor.—Drift-ice is usually driven into this harbor, as into Nantucket, by NW. winds; and, although it does not entirely prevent the ingress and egress of steamers, it renders the movements of sailing-vessels very hazardous. In the winter of 1874-5 this drift-ice formed "a pack" extending out to a line from Cape Poge to the beach outside of Eel Pond, and remained solid from the 17th of January until the 8th of March. The Inner Harbor (that portion inside of the light-house) rarely freezes, on account of the strength of the tidal currents; but in very severe winters it is closed for several days at a time, completely barring all entrance or exit.

The effect of winds on the ice is the same as that at Nantucket.

Vineyard Haven, (Holmes' Hole.)—In this harbor ice is both "local" and "drift." The former is almost always a serious obstruction to the movements of vessels, and sometimes completely closes the harbor. The latter, which is forced in from Nantucket and Vineyard sounds, is also very dangerous to sailing-vessels; and in severe winters forms "field-ice," dragging vessels from their moorings, and sometimes driving them ashore. During the winter of 1874-5 the harbor was completely filled by both "local" and "drift" ice, and rendered entirely untenable for vessels of every description between the 6th and 22d of February. It finally broke up about March 6th.

Strong NE. to NW. winds drive the floes from the Sounds into this harbor; while, on the contrary, southerly winds operate not only to prevent formations, but also to remove any accumulations that may have occurred during northerly winds. The period most favorable to local formations is during westerly winds.

Tidal currents have no material influence either way.

Hyannis Roads.—Accumulations of ice rarely occur in these Roads, as the prevailing northerly winds remove any that may form into the channels of the Sound, whence it seldom returns. During very severe winters, however, when the Sound itself becomes filled with floes and "pack" ice, the accumulations in this and other anchorages on the northern shore become so extensive as to form an effectual barrier to all navigation. Such an event occurred in February, 1875, when, from the 8th to the 22d, all navigation was closed on the northern side of Nantucket Sound; and movements of sailing-vessels were rendered dangerous, if not impossible, between the 10th of January and the 5th of March.

NE. to NW. winds remove both "local" and "drift" ice from the Roads, and are, as a rule, very effective in keeping them clear. Southerly winds, if strong, are apt to force drift-ice into the Roads; but such winds occur very rarely during the winter months. As a rule, therefore, in ordinary winters the Roadstead may be considered comparatively clear of ice.

The current of ebb aids the northerly winds to clear away the ice; while the flood current, as a sequence, tends to carry "drift" ice in from the North Channel of the Sound. Unless during southerly winds or calms, however, the flood has little or no effect,—being overcome by the northerly winds.

Wood's Hole.—Owing to the velocity of the tidal currents, ice does not form in this harbor, except in severe winters, when the "drift" ice in Buzzard's Bay has been known to lodge across the northern entrance, forming a complete barrier to the passage of vessels in that direction. This occurred in the winter of 1875, when the northern entrance was closed by a heavy "pack" from January 15th to March 5th. "Drift" ice, however, frequently passes through Wood's Hole from Buzzard's Bay to Vineyard Sound; but it is not in sufficient quantities to prevent vessels from entering the harbor. The tidal current being so strong, the winds have no effect upon the movements of ice.

NANTUCKET SHOALS

is the name given to that large extent of shoal ground which extends to the eastward and southeastward from Nantucket Island,—making its vicinity one of the most dreaded parts of the coast. These shifting sand shoals have various depths upon them, ranging from six feet to four fathoms, and change their positions more or less after every heavy gale. Beginning at the northernmost, they are named McBlair's Shoal, Twelve Feet Shoal, Old Man Shoal, Bass Rip, The Rose and Crown, Great Rip, Eight Feet Rip, Nine Feet Rip, Davis' Bank, Old South Shoal, Fishing Rip, Davis' or New South Shoal, Phelps' Bank, and Asia Rip,—the last named being a little over thirty-nine miles to the south-eastward of Sankaty Head. Coasters rarely pass outside of Nantucket,—the Sounds offering a shorter, safer, and more convenient thoroughfare, while, on the contrary, large vessels, and those engaged in foreign trade, or belonging to foreign nations, seldom, if ever, pass through the Sounds. To such

vessels, therefore, Nantucket Shoals are a source of great dread and anxiety, as the shifting nature of the sands, the velocity and bewildering set of the currents, and the little reliable information attainable as to their set and drift, all tend to confuse a seaman, if, by the accident of thick weather or otherwise, he should find himself entangled among them. It is proposed in the following pages to give a careful detailed description of each of these shoals, with directions for crossing and for avoiding them.

McBlair's Shoal, the northernmost of Nantucket Shoals proper, is separated from Great Round Shoal (the southernmost of the Monomoy Shoals) by a deep pocket over three-quarters of a mile wide, with from eleven to sixteen fathoms in it. The shoal itself is a series *McBlair's Shoal* of small detached sand bars, with from nine to eighteen feet water upon them, extending over a space of two miles and a half long in an E. and W. direction. Its eastern extremity bears from

	Miles.
Monomoy Point Light-house, SE. by S. -----	12 $\frac{5}{8}$
Nantucket Light-house, E. $\frac{1}{2}$ S. -----	11 $\frac{1}{2}$
Sankaty Head Light-house, NE. by E. $\frac{1}{2}$ E. -----	10 $\frac{3}{4}$

The western end bears from Nantucket Light-house E. $\frac{1}{2}$ S., nine miles and a quarter, and from Handkerchief Light-vessel SE. $\frac{1}{2}$ E., eleven miles and an eighth distant. The shoalest water is nearly midway between the eastern and western ends, but rather nearer to the former; and soundings of nine feet are found upon it at mean low water,—Nantucket Light-house bearing W. $\frac{3}{4}$ N., ten miles and a half distant.

To avoid McBlair's Shoal, on approaching it from the northward or eastward, the rule is not to go to the westward of Pollock Rip Light-vessel bearing NW. by N. $\frac{1}{2}$ N.

Twelve Feet Shoal lies a little over two miles SSE. from the nine-feet spot on McBlair's Shoal,—the soundings between them varying from four to nine fathoms, with very broken bottom. It is always noticeable, in clear weather, by the strong rip over it,—the *Twelve Feet Shoal* current running about NE. by N. and SW. by S. with a velocity of from a mile and a half to two miles an hour. As its name implies, it has twelve feet at mean low water, with Nantucket Light-house bearing W. by N. $\frac{1}{2}$ N., eleven miles and five-eighths distant.

The line of ten fathoms around Nantucket Island extends (near the northern end of the Shoals) to the eastward twenty-one and a half miles from Nantucket Light-house, and nineteen miles from Sankaty Head Light-house,—the former bearing W. by N. and the latter W. $\frac{3}{4}$ S. It is, therefore, nearly ten miles outside of McBlair's and Twelve Feet shoals.

Of the rips and shoal spots inside of McBlair's and Twelve Feet shoals there are four,—the northernmost, called the *Eighteen Feet Rip*, lying a little over five and a quarter miles SE. by E. $\frac{1}{4}$ E. from Nantucket Light-house. About three-eighths of a mile to the southward of this lies another, called the *Fourteen Feet Rip*, which bears from Nantucket Light-house SE. by E., five and five-eighths miles distant; and about seven-eighths of a mile to the southward of this is the *Ten Feet Rip*, an area of shoal ground, with soundings of from ten to eighteen feet upon it, extending in a SE. $\frac{3}{4}$ E. direction, and nearly a mile and a quarter long. This shoal bears from Nantucket Light-house SE. $\frac{3}{4}$ E.,—its western end being nearly six miles from the light and its eastern end seven miles and a quarter. What is called the *Outer Eighteen Feet Rip* lies about a mile to the eastward of this, and bears from Nantucket Light-house SE. $\frac{3}{4}$ E., eight miles distant. A good channel, four miles and a half wide and with from five to nine fathoms in it, exists between these rips and McBlair's and Twelve Feet shoals.

The dangerous shoal called The Rose and Crown (which has seven feet upon it at low water) lies nearly N. by E. and S. by W., and is about three miles and three-quarters long. At its northern end it has twelve feet; at its southern end ten feet; and nearly midway between the two extremities, seven feet. It also forms part of that extensive area of shoal ground known as Great Rip.

The northern end of The Rose and Crown bears from Nantucket Light-house SE. *The Rose and Crown* by E. $\frac{1}{4}$ E., fourteen miles and five-eighths, and from Sankaty Head Light-house E., ten miles and five-eighths distant. The southern end bears from Nantucket Light-house SE. $\frac{3}{4}$ E., sixteen miles and a half, and from Sankaty Head Light-house E. by S. $\frac{3}{4}$ S., ten miles and three-quarters distant; while the "seven-feet spot" bears from Nantucket Light-house SE. $\frac{3}{4}$ E., sixteen miles, and from Sankaty Head Light-house E. by S., eleven miles distant.

A little over four miles to the eastward of The Rose and Crown lies Fourteen Feet Shoal, a narrow sand-spit, with fourteen feet water, lying N. by E. and S. by W., and nearly a mile long. Its northern end bears from Nantucket Light-house SE. by E. $\frac{3}{4}$ E. and the *Fourteen Feet Shoal* southern end SE. by E. $\frac{1}{2}$ E. Nearly, distant nineteen and three-quarter miles. The sailing-line for clearing the Shoals passes over six miles to the eastward of it.

Great Rip (as before remarked) is an extensive series of shoals lying in a N. by E. and S. by W. direction, over a space of between eleven and twelve miles; or, between the bearings of E. and SE. $\frac{1}{4}$ S. from Sankaty Head Light-house. Its northern end is formed by The Rose and *Great Rip* Crown, and its southern end by the *Eight Feet Rip*; while about three miles and a quarter to the northward of the latter lies *Four Feet Shoal*, a very dangerous spot, whose name indicates the depth upon it. Between The Rose and Crown and this shoal are various

spots with from eleven to seventeen feet upon them; while between it and the Eight Feet Rip are others with from twelve to fifteen feet. Over all these shoals the rips are very strong,—the tide running at the rate of between two and three miles an hour.

The Four Feet Shoal on Great Rip bears from Sankaty Head Light-house **SE.** by **E.**, twelve miles and three-quarters distant, and the Eight Feet Rip, on its southern end, bears from the same light-house **SE.**, fourteen miles and five-eighths distant.

Davis' Bank is an extensive shoal nearly eighteen miles long, (with soundings over it varying from three and a half to ten fathoms,) lying at an average distance of about a mile and a half to the eastward of Great Rip and extending in a **NNE.** and **SSW.** direction. Fourteen

Davis' Bank. Feet Shoal, above described, lies at its northern extremity, bearing from Nantucket Light-house **SE.** by **E.** $\frac{3}{4}$ **E.**, nineteen miles and three-quarters, while the southern end of the bank bears from Sankaty Head Light-house **SE.** by **S.** $\frac{3}{4}$ **S.**, distant twenty-one and a half miles. Three fathoms is found upon this bank seventeen miles and a half **SE.** $\frac{1}{4}$ **S.** from Sankaty Head Light-house, and soundings of five and six fathoms are found all along its length.

There are several shoal spots, having from five to eight fathoms upon them, lying at distances of from four to eight miles to the eastward of Davis' Bank and from twenty-three to twenty-nine miles from Sankaty Head Light-house, being scattered over the space between the bank and Fishing Rip. The sailing-line for crossing the Shoals passes over these spots with from seven to eight fathoms water.

A great number of rips and sand shoals lie to the eastward and southeastward of Sankaty Head and render an approach to it from those directions exceedingly dangerous. Of these the largest and most important is Bass Rip, extending in a **N.** by **E.** $\frac{1}{2}$ **E.** direction for four miles and three-eighths,

Bass Rip. with soundings of six feet at mean low water through more than half its length. Its northern end, which has nine feet at mean low water, bears **E.** by **S.**, two and three-quarter miles from Sankaty Head Light-house. The middle of the shoal, which has six feet, bears **SE.** from the same light-house, three and three-eighths miles distant; and its southern end, which has fourteen feet, bears from the light-house **S.** by **E.** $\frac{3}{4}$ **E.**, four miles and five-eighths distant. The northern end of the rip is eight and a quarter miles **W.** by **N.** from the shoal of The Rose and Crown; and the southern end is seven miles and three-quarters **N.** by **W.** $\frac{3}{4}$ **W.** from the northern end of Old South Shoal.

Of the shoal spots to the eastward of Bass Rip there are, first, a fourteen feet spot, lying a mile and three-quarters to the eastward of the northern end of the rip, bearing **E.** by **S.** $\frac{3}{4}$ **S.** from Sankaty Head Light-house, distant four miles and three-quarters, and from the southern end of The Rose and Crown **W.** by **N.** $\frac{3}{4}$ **N.**, distant six miles: Second, a line of rips, separated by narrow channels, and extending **E.** by **N.** $\frac{1}{2}$ **N.** from the southern end of Bass Rip for four miles,—the depth upon it varying from fourteen to eighteen feet. The eastern end of this line of shoals bears from Sankaty Head Light-house **SE.** by **E.**, distant six and a quarter miles.

Old Man Shoal is a very long sand bar of irregular shape, which begins at the beach abreast of Siasconsett and about a mile and a quarter below Sankaty Head, (where it is locally called *Pochick Rip*,) and runs along the southeastern and southern face of Nantucket Island at distances from shore varying from three-quarters of a mile to three miles. It has from six to twelve feet

Old Man Shoal. upon it in spots,—the shoal spots being separated by slues with from thirteen to eighteen feet through them. The course of this shoal is, first, **E.** by **S.** for nearly a mile, with from seven to eleven feet water; then turns abruptly to the southward, running about **SW.** by **S.** $\frac{1}{2}$ **S.** for a little over a mile and a half, with soundings varying from six to sixteen feet. Thence **SW.** $\frac{1}{4}$ **W.** for a little over a mile, with from eight to eighteen feet; thence **SSW.** for a mile and a quarter, with not less than thirteen feet; then **WSW.** for nearly two miles, with from eight to eighteen feet. From this southwestern end of the shoal Tom Never's Head bears **NE.** $\frac{1}{2}$ **N.**, four miles distant.

There is a depth of from four to twelve fathoms between Old Man Shoal and Nantucket; but it runs into a pocket abreast of Siasconsett, and there is no passage through.

Four small rips, with from thirteen to eighteen feet water, lie still farther to the southward and eastward, between the bearings of **SE.** and **S.** by **E.** $\frac{1}{4}$ **E.** from Sankaty Head Light-house. The easternmost, which has thirteen feet, is eight and three-quarter miles **SE.** $\frac{1}{2}$ **S.** from Sankaty Head Light-house, with a tide-rip over it of more than two miles an hour. A mile and a quarter to the northwestward of it lies another with fourteen feet, which bears from Sankaty Head Light-house **SE.** $\frac{1}{4}$ **S.**, seven and a half miles distant; and two miles and five-eighths **W.** $\frac{1}{2}$ **N.** from this lies a third, with seventeen feet, which bears from Sankaty Head Light-house **S.** by **E.** $\frac{3}{4}$ **E.**, distant six miles, and from Tom Never's Head **SE.** $\frac{3}{4}$ **E.**, distant four and a half miles. About three-quarters of a mile **SSW.** from the seventeen-foot rip lies the westernmost of the shoals, which bears **S.** by **E.** $\frac{1}{4}$ **E.** from Sankaty Head Light-house, distant six miles and three-quarters.

Eight Feet Shoal. Eight Feet Shoal is a small sand shoal, with eight feet at mean low water, which lies eight and three-quarter miles **SE.** by **S.** $\frac{1}{4}$ **S.** from Sankaty Head Light-house and seven and a half miles **SE.** $\frac{3}{4}$ **E.** from Tom Never's Head. From this shoal the northeastern end of the Old South Shoal bears **S.** $\frac{1}{4}$ **W.**, four miles distant. It may be men-

tioned, in this connection, that between Great Rip and the shoals which lie off Sankaty Head there is a passage two miles and three-quarters wide, through which not less than four and three-quarter fathoms can be taken into the Main Channel of Nantucket Sound; but it is not a safe channel, owing to the strong tides over the shoals and the shifting nature of the sands.

The southeastern extremity of Nantucket Shoals proper is called Fishing Rip, and has not less than four and a quarter fathoms upon it. Its shape is irregular, but the general course is about NE. and SW. and the length nine miles. The northern end of the rip bears from Sankaty Head Light-house SE. by E., twenty-eight miles, and the southern end bears from the same light-house SE. $\frac{1}{2}$ S., twenty-eight miles distant. From this southern end the light-vessel on Davis' New South Shoal bears W. $\frac{1}{4}$ S., sixteen and a half miles distant.

Fishing Rip.

Old South Shoal, one of the most dangerous of the shoals to the southeastward of Nantucket, is a sand-spit with an average width of three-eighths of a mile and two miles and three-eighths long, which lies in a nearly NE. and SW. direction, between the bearings of S. by E. $\frac{1}{2}$ E. and S. $\frac{3}{4}$ E. from Sankaty Head Light-house. Its northern end, which has seven feet, bears from Davis' South Shoal Light-vessel N. by E., ten miles and a half, and from Sankaty Head Light-house S. by E. $\frac{1}{2}$ E., twelve miles and five-eighths distant. Its southern end, which has six feet, bears N. $\frac{1}{4}$ E. from Davis' South Shoal Light-vessel, a little over nine miles, and from Sankaty Head Light-house S. $\frac{3}{4}$ E., fourteen miles distant. Between the two extremities the soundings vary between six and fourteen feet.

Old South Shoal.

Five and a half miles to the southward of Old South Shoal lies Davis' or New South Shoal, the southernmost of all the sand-spits to the southward of Nantucket. It lies E. by S. and W. by N., has from eight to fourteen feet water upon it, is two miles and five-eighths long with an average width of five-eighths of a mile. The eastern end of this shoal bears S. $\frac{1}{4}$ E. from Sankaty Head Light-house, distant nineteen miles and five-eighths, and has fourteen feet water. The western end bears from the same light-house S., nineteen miles and one-third, and has nine feet water. Three and a half miles SE. by S. $\frac{5}{8}$ S. from the western end of the shoal, and three miles S. by W. $\frac{1}{4}$ W. from the eastern end, is placed the light-vessel, which is called Davis' South Shoal Light-vessel. It is schooner-rigged, the hull painted red, with a red hoop-iron day-mark at each mast-head, and the words "Nantucket Shoals," in white letters, on each side. It shows two fixed white reflector lights from a height of forty-four feet above the sea, visible twelve miles. Its approximate geographical position is

Davis' or New South Shoal.

Davis' South Shoal Light-vessel.

Latitude ----- 40° 56' N.
Longitude ----- 69° 51' W.,

and it bears from

	Miles.
Sankaty Head Light-house, S. $\frac{3}{4}$ E.-----	22 $\frac{5}{8}$
Gay Head Light-house, SE. $\frac{3}{8}$ E.-----	52
Block Island North Light-house, SE. by E. $\frac{1}{8}$ E.-----	80 $\frac{1}{2}$
Montauk Point Light-house, E. by S. $\frac{1}{2}$ S.-----	91 $\frac{3}{4}$

There is a fog-bell, fog-horn, and gun at this light-vessel. A red can-buoy, of the first-class, with the words "South Shoal" on its head, is placed in fourteen fathoms water about a mile and a quarter to the northward of the light-vessel, between it and the shoal.

If a vessel steers E. from Davis' South Shoal Light-vessel for thirty miles, she will be clear of the Shoals and may shape her course accordingly to the northward.

To the southward of the light-vessel there are no shoals, although banks with from seven to nine fathoms extend to the southwestward for six miles and three-quarters,—their southwestern extremity bearing SW. $\frac{1}{4}$ W. from the light-vessel. Navigators, however, usually pay no attention to these banks, but shape their course from the light-vessel without reference to them.

Phelps' Bank is the most southeasterly of the shoal grounds off Nantucket Island. It lies in a NE. by E. and SW. by W. direction, is eleven miles and a half long, with an average width of a mile and a quarter, and has over it from ten to nineteen fathoms water. Its northeastern end bears from Sankaty Head Light-house SE. $\frac{1}{4}$ S., distant thirty-eight and a half miles, and from Davis' South Shoal Light-vessel E. by S., twenty-six and a quarter miles distant. Its southwestern end, which is known as Asia Rip and has eleven fathoms, bears from Sankaty Head Light-house SE. by S. $\frac{3}{8}$ S., thirty-nine miles, and from Davis' South Shoal Light-vessel SE. $\frac{1}{4}$ E., twenty miles and three-quarters distant. To the eastward of Phelps' Bank there are no shoals until George's Bank is reached.

Phelps' Bank.

It may be remarked that there exists a channel, which is sometimes used by coasters, leading between Bass Rip on the east and Old Man Shoal on the west, and thence along the eastern face of Nantucket Island,—joining the Main Channel of Nantucket Sound off Point Rip. Through this channel there is not less than ten fathoms between Bass Rip and the Old Man, and not less than four

fathoms as far up as Point Rip. It is not, however, suitable for strangers, and is not recommended to any one, as none of the shoals are buoyed. In coming into this channel from the westward the southern shore of Nantucket Island should not be approached nearer than a mile and three-eighths, as there is a twelve-foot shoal, known as *Weedweeder Shoal*, which makes off from that shore to the southward about five-eighths of a mile. It is five miles and three-quarters to the westward of Tom Never's Head and is not buoyed.

BOTTOMS AND CHARACTERISTIC SOUNDINGS

ON NANTUCKET SHOALS AND THEIR APPROACHES.

A vessel from Cape Ann, bound outside the Shoals, will strike twenty fathoms in Latitude $41^{\circ} 36' 15''$ N., Longitude $69^{\circ} 40' 45''$ W.—with Monomoy Point Light-house bearing W. $\frac{1}{2}$ N., distant a little over fourteen miles; Nantucket Light-house SW. by W. $\frac{3}{4}$ W., twenty-one miles; and Sankaty Head Light-house SW., twenty-three and a half miles distant. The bottom will vary between coarse grey sand and gravel and coarse white and yellow sand. From this point the soundings will gradually decrease to the southward,—there being found, first, eighteen fathoms, with brown and yellow gravel and black specks; then seventeen, with coarse gravel and shells; then sixteen, coarse sand, pebbles and specks; then fourteen, gravel, sand and broken shells; and then nineteen, with fine sand, black specks and broken shells;—this last characteristic sounding and bottom being indicative of the vessel being off the eastern end of the Shoals, with Sankaty Head Light-house bearing W. by N. $\frac{1}{4}$ N., twenty-three and a half miles distant. The soundings now gradually increase to the turning point in the course, three and a half miles to the southward, where the depth will be twenty-three fathoms, white sand and broken shells, with Davis' South Shoal Light-vessel bearing SW. by W. $\frac{3}{4}$ W., twenty-six and a quarter miles distant. On the course for the light-vessel the soundings are very irregular,—ranging all the way from six to twenty-five fathoms,—the shoalest soundings almost invariably showing hard grey sand; while in the deeper water coarse sand and gravel, coarse grey sand and shells, and coarse sand, pebbles and broken shells will be brought up. When clear of the Shoals to the westward, as soon as the water deepens to over twenty fathoms, fine grey sand will be brought up, and this in turn will be followed by a mixture of sand and mud.

A vessel from Portland, intending to pass outside the Shoals, will strike twenty fathoms in Latitude $41^{\circ} 25' N.$, Longitude $69^{\circ} 27' 30'' W.$, with Nantucket Light-house bearing W. $\frac{3}{4}$ N., a little over twenty-six miles distant, and Sankaty Head Light-house W. $\frac{3}{4}$ S., twenty-four miles distant. The bottom will be coarse grey sand and black specks, and the soundings will diminish, within a space of a mile and a half, to fourteen fathoms, then rapidly increase to twenty-two fathoms, again diminishing to seventeen fathoms, and then increasing to twenty-five fathoms,—the bottom being mostly coarse sand and broken shells. The soundings will then average about twenty-three fathoms until the turning point in the course is reached, with Davis' South Shoal Light-vessel bearing SW. by W. $\frac{3}{4}$ W., on which course the characteristics will be the same as those given above.

A vessel from Seguin, intending to pass outside the Shoals, will strike the same soundings, and at about the same localities, as the one from Cape Elizabeth.

A vessel from Penobscot Bay, having taken her departure from Matineus Rock Light-houses, would steer S. by W. $\frac{1}{4}$ W. to pass outside the Shoals, in which case she will not strike the twenty-fathom curve at all, but will gradually decrease her soundings until in Latitude $41^{\circ} 21' 30'' N.$, Longitude $69^{\circ} 22' W.$, when there will be twenty-two fathoms, grey sand, gravel and broken shells, and the soundings will then increase, within a space of two miles, to thirty-four fathoms, and again diminish to twenty-three fathoms, white sand and broken shells, at the turning point of the course, with Sankaty Head Light-house bearing W NW., twenty-five and a half miles, and Davis' South Shoal Light-vessel SW. by W. $\frac{3}{4}$ W., twenty-six and a quarter miles distant.

Vessels which have come outside of Mount Desert Rock, and have taken their departure with the light bearing W., five miles distant, will find the soundings gradually decrease, on approaching the Shoals, until at the turning point in the course, with Davis' South Shoal Light-vessel bearing SW. by W. $\frac{3}{4}$ W. and Sankaty Head Light-house W NW., when the depth will be twenty-three fathoms, white sand and broken shells, and the soundings on the course for the light-vessel will be the same as those mentioned above. These remarks apply with equal exactness to vessels bound from the Bay of Fundy.

but should such a vessel wish to pass clear outside of Phelps' Bank, she would, when in Latitude $41^{\circ} 43' 30''$ N., Longitude $69^{\circ} 0'$ W., steer SSW.; when the depth will gradually decrease to thirty-two fathoms in Latitude $41^{\circ} 0' 50''$ N., Longitude $69^{\circ} 10' 30''$ W., with Davis' South Shoal Light-vessel bearing W. $\frac{1}{4}$ S., distant thirty miles and a half. The depth will then gradually increase to thirty-eight fathoms, and then diminish to thirty-two fathoms off Phelps' Bank; and at the turning point of the course to the westward the depth will be thirty fathoms, fine grey sand and black specks, and Davis' South Shoal Light-vessel will bear NW. $\frac{1}{4}$ W., twenty-eight miles distant. The geographical position will be Latitude $40^{\circ} 40' 10''$ N., Longitude $69^{\circ} 19' 10''$ W.

Bottoms and Soundings.

A vessel from the Eastward, having taken her departure, with Cape Sable Light-house bearing N., distant ten miles, and wishing to pass to the eastward of George's Bank and thence outside of Nantucket Shoals, will cross Brown's Bank in about thirty-nine fathoms, coarse sand, and will pass twenty-one miles to the eastward of The Georges, in thirty-three fathoms, fine white and grey sand. When in Latitude $41^{\circ} 13'$ N., Longitude $67^{\circ} 16'$ W., the depth will be thirty-two fathoms, fine white sand, and the course W. $\frac{3}{4}$ S. to pass to the southward of Phelps' Bank. On this course soundings of from twenty-four to thirty fathoms will be found until in Latitude $40^{\circ} 45' 50''$ N., Longitude $69^{\circ} 0'$ W., where there will be thirty-nine fathoms, grey sand, and Asia Rip will bear W. by N. $\frac{3}{4}$ N., distant seventeen miles, and Davis' South Shoal Light-vessel WNW., thirty-nine miles distant. From this point the depth will gradually diminish to Latitude $40^{\circ} 40' 10''$ N., Longitude $69^{\circ} 19' 10''$ W., which is the turning point in the course to the westward. Here the depth will be thirty fathoms, and Davis' South Shoal Light-vessel will bear NW. $\frac{1}{4}$ W., twenty-eight miles distant.

The bottom on McBlair's and Twelve Feet shoals is gravel and sand; on the rips between them and Nantucket Island, grey sand; on Old Man Shoal, coarse white and yellow sand and black specks; on Bass Rip, coarse grey sand; on Great Rip, gravel and broken shells near the Eight Feet Rip and Four Feet Shoal, pebbles and broken shells between that and The Rose and Crown, and gravel and pebbles alternating with white and grey sand on The Rose and Crown; on Davis' Bank, coarse gravel and broken shells at its southern end, gravel and broken shells on the middle of the bank, and fine sand and black specks at its northern end; on Fourteen Feet Shoal, coarse sand, pebbles and black specks; on Fishing Rip, coarse gravel near the centre, and fine sand, gravel and shells at its southern end; on Old South Shoal, coarse sand and pebbles at its northern end, and dark grey sand with black specks near the middle; on Davis' South Shoal, light grey sand; and on Phelps' Bank, fine dark grey sand, with black specks, white and yellow pebbles, and broken shells. In the channel between Great Rip and Bass Rip there will be found sand and small pebbles, alternating with coarse sand and gravel, to the westward of the southern end of Great Rip; sand, broken shells and pebbles about midway of the passage, with Sankaty Head Light-house bearing NW. by W.; sand and shells to the westward of the southern end of The Rose and Crown; mud abreast of the middle of that shoal, with Sankaty Head Light-house bearing W. $\frac{3}{4}$ N.; gravel and sand to the westward of the northern end of The Rose and Crown, with Sankaty Head Light-house bearing W.; coarse grey sand and gravel, with broken shells, with the same light-house bearing W. $\frac{3}{4}$ S., and Nantucket Light-house NW. by W. $\frac{1}{2}$ W.; and large pebbles about two miles to the westward of Twelve Feet Shoal, with Nantucket Light-house bearing W. by N. $\frac{1}{2}$ N.

SAILING DIRECTIONS

FOR PASSING OUTSIDE OF NANTUCKET SHOALS FROM THE EASTWARD.

I. *A vessel from Cape Ann*, intending to pass outside the Shoals, and thence to the westward, should take her departure with Thatcher's Island Light-houses bearing W., six miles and a half distant, with a depth of twenty-two fathoms, and steer S. by E. $\frac{3}{4}$ E., which will lead, with not less than fourteen fathoms, outside of the Shoals. She will strike sixteen fathoms two miles and a half from the eastern coast of Cape Cod, with Highland Light-house bearing NW. $\frac{1}{2}$ N., seven miles distant; will gradually increase the soundings to forty-seven fathoms, with Chatham Light-houses bearing SW. $\frac{1}{4}$ W., nine miles and a half distant; and will then gradually shoal her water, carrying from twenty-two to fourteen fathoms, during the continuance of the course. When in Latitude $41^{\circ} 12' 30''$ N., Longitude $39^{\circ} 24' 20''$ W., Sankaty Head Light-house bearing WNW., twenty-five and a half miles distant, the

Sailing Directions --- **Nantucket Shoals.** depth will be twenty-three fathoms, "fine white sand and broken shells," and Davis' South Shoal Light-vessel will bear **SW.** by **W.** $\frac{3}{4}$ **W.**, distant twenty-six and a quarter miles, and that course will lead, with not less than six fathoms, up to the light-vessel. From the light-vessel **NW.** by **W.** $\frac{3}{4}$ **W.** will lead towards Block Island North Light-house; **NW.** by **W.** $\frac{1}{2}$ **W.** towards Point Judith; and **W.** by **N.** $\frac{1}{4}$ **N.** towards Montauk Point.

The course for Sandy Hook Light-vessel is **W.** $\frac{1}{8}$ **S.** and the distance one hundred and eighty-five miles.

The above courses pass three miles to the eastward of Highland Light-house; ten miles to the eastward of Monomoy Shoals; the same distance to the eastward of McBlair's Shoal; six miles to the eastward of Fourteen Feet Shoal; and ten miles and a quarter to the eastward of The Rose and Crown. They pass three miles and a half to the southeastward of the middle of Davis' Bank and cross its southern end in six and a half fathoms. They also pass two and a half miles to the southward of Davis' South Shoal.

II. **A vessel from Portsmouth,** intending to pass outside the Shoals, and thence to the westward, should, when White Island Light-house bears **E.**, distant one mile, steer **S.** by **E.** $\frac{1}{2}$ **E.** until Thatcher's Island Light-houses bear **W.**, at which point she will cross the western end of Jeffrey's Ledge in twenty-two fathoms water, "fine grey and red sand with black specks." From this point the course is **S.** by **E.** $\frac{3}{4}$ **E.**, as before, to pass outside the Shoals, and until Davis' South Shoal Light-vessel bears **SW.** by **W.** $\frac{3}{4}$ **W.**, when that course should be steered, following the directions given above.

The above courses will pass a little over six miles to the eastward of Thatcher's Island Light-houses.

III. **A vessel from Portland,** intending to pass outside the Shoals, and thence to the westward, would take her departure with Cape Elizabeth Light-houses bearing **N.** $\frac{1}{8}$ **W.**, five miles distant, with a depth of twenty-five fathoms, and would steer **S.** $\frac{1}{8}$ **E.**, crossing the northeastern end of Jeffrey's Ledge in thirty fathoms water, "coarse grey sand and black specks,"—White Island Light-house bearing **W.** $\frac{1}{4}$ **N.**, distant twenty-eight miles. She will have from fifty to one hundred and thirty fathoms, after crossing the ledge, until nearly up with the latitude of Cape Cod, when the water will gradually shoal again,—fifty fathoms being found in Latitude $41^{\circ} 41' \text{ N.}$, Longitude $69^{\circ} 34' \text{ W.}$, with Chatham Light-houses bearing **W.** $\frac{3}{4}$ **N.**, seventeen miles distant. Twenty fathoms will be first found in Latitude $41^{\circ} 25' \text{ N.}$, Longitude $69^{\circ} 27' 30'' \text{ W.}$, with Nantucket Light-house bearing **W.** $\frac{3}{4}$ **N.**, a little over twenty-six miles distant. After striking twenty fathoms the soundings will range all the way from fourteen to twenty-five fathoms until the turning point in the course is reached, when there will be twenty-three fathoms, "white sand and broken shells;" Sankaty Head Light-house will bear **W NW.**, twenty-five and a half miles distant, and **SW.** by **W.** $\frac{3}{4}$ **W.** must be steered for Davis' South Shoal Light-vessel, following the directions given above.

IV. **A vessel from Seguin,** intending to pass outside the Shoals, should bring Seguin Light-house to bear **N.** $\frac{3}{4}$ **E.** and steer **S.** $\frac{3}{4}$ **W.**, which course will pass twenty miles to the eastward of Jeffrey's Ledge. Should soundings be obtained in one hundred fathoms on this course, shortly after leaving Seguin, Cape Elizabeth Light-houses will bear **NW.** $\frac{1}{4}$ **W.**, twenty-four miles distant, and from this position the depth will range above one hundred fathoms until to the southward of Cape Cod or Highland Light-house, when, if bottom be found in one hundred fathoms, "blue mud," the light-house will bear **NW.** by **W.** $\frac{3}{4}$ **W.**, twenty-five and a half miles distant. From this position the soundings will gradually decrease to the turning point in the course, where the depth will be twenty-three fathoms, "white sand and broken shells," as before, with Sankaty Head Light-house bearing **W NW.** and Davis' South Shoal Light-vessel **SW.** by **W.** $\frac{3}{4}$ **W.**, which latter course should be steered, following the directions previously given.

V. **A vessel from Penobscot Bay,** intending to pass outside the Shoals, should bring Matinicus Rock Light-houses to bear **N NE.** and steer **S SW.**, on which course she will pass eight miles to the westward of Cashe's Ledge with soundings of over one hundred fathoms, "mud and shells." She will not strike twenty fathoms at all until past the turning point in the course, and steering **SW.** by **W.** $\frac{3}{4}$ **W.** for Davis' South Shoal Light-vessel. The **S SW.** course should be continued until in Latitude $41^{\circ} 12' 30'' \text{ N.}$, Longitude $69^{\circ} 24' 20'' \text{ W.}$, when the depth will be twenty-three fathoms, "white sand and broken shells," with Sankaty Head Light-house bearing **W NW.**, twenty-five and a half miles distant, and **SW.** by **W.** $\frac{3}{4}$ **W.** should be steered for Davis' South Shoal Light-vessel.

VI. *A vessel which has taken her departure from Mount Desert Rock, having Sailing Directions---Nantucket Shoals.* the light bearing **W NW.**, distant five miles, and wishing to pass outside Nantucket Shoals and thence to the westward, should steer **SW. by S.**, which course will lead about fifteen miles to the eastward of Cashe's Ledge in from one hundred to one hundred and ten fathoms, muddy bottom. After passing the ledge the depth will gradually increase to one hundred and forty fathoms, and then as gradually diminish,—striking one hundred fathoms in **Latitude 42° 9' 30'' N., Longitude 68° 51' 46'' W.**, from which point Cape Cod or Highland Light-house will bear **W. ½ N.**, distant fifty-two and a half miles, and Nantucket Light-house **SW. by W. ½ W.**, distant a little over seventy miles. From this position the soundings will vary from seventy-five to one hundred fathoms until in **Latitude 41° 43' 40'' N., Longitude 69° 7' 15'' W.**, after which they will gradually diminish to the turning point in the course, where the depth will be twenty-three fathoms, "fine white sand and broken shells," in **Latitude 41° 12' 30'' N., Longitude 69° 24' 20'' W.**, and the course thence for Davis' South Shoal Light-vessel will be **SW. by W. ¾ W.**, following the directions given above.

Or, should such a vessel wish to pass clear outside of Phelps' Bank, and thence to the westward, she should take her departure, as before, with Mount Desert Rock Light-house bearing **W NW.**, distant five miles, and steer **SW. by S. ¾ S.**, passing nineteen miles to the eastward of Cashe's Ledge in from one hundred to one hundred and twenty fathoms,—forty-four miles to the westward of the shoal of The Georges and thirty-one miles to the westward of Cultivator Shoal. When to the southward of **Latitude 42° 13' N.**, the soundings will gradually decrease until the turning point in the course is reached, which will be in **Latitude 40° 40' N., Longitude 69° 19' W.** Here the depth will be thirty-two fathoms, "fine grey sand with black specks,"—Davis' South Shoal Light-vessel bearing **NW. ¼ W.**, twenty-eight miles distant, and Sankaty Head Light-house **NW. by N. ½ N.**, forty-seven and a half miles distant. Now, if bound to Narragansett Bay, **NW. by W. ¼ W.** will lead directly to Point Judith; if bound into Long Island Sound, **W. by N. ⅓ N.** will lead to Montauk Point Light-house; if bound to New York, **W. ¾ N.** will lead to Sandy Hook Light-vessel; and if bound to Philadelphia, **W. by S. ½ S.** will lead to the light-vessel on Five Fathom Bank.

The above courses pass two miles to the eastward of the northern end of Phelps' Bank and seven miles and a half to the southward of Asia Rip. The course for Point Judith passes four miles and a half to the southward of Davis' South Shoal Light-vessel, while that for Montauk Point passes nine miles to the southward, and that for Sandy Hook Light-vessel eighteen miles to the southward of the same light-vessel.

VII. *A vessel which has come through the Grand Manan Channel from Eastport or Passamaquoddy Bay* should get Machias Seal Island Light-houses to bear **E.**, distant a little over three and a half miles, and steer **SW. ¾ S.**, in order to pass outside the Shoals to Davis' South Shoal Light-vessel. On this course she will strike one hundred fathoms about eleven miles to the southwestward of the lights, in **Latitude 44° 21' N., Longitude 67° 15' 45'' W.**, with Petit Manan Light-house bearing **W. by N. ½ N.**, twenty-six miles distant, and Bryer's Island Light-house **SE. by E. ⅓ E.**, thirty-eight miles distant. The bottom will be "red clay." From this to the southward the soundings will vary between eighty and one hundred and twenty fathoms, and the course will pass twenty-five miles to the eastward of Cashe's Ledge, forty-eight miles to the westward of the shoal of The Georges, and thirty-six miles to the westward of Cultivator Shoal. When in the latitude of The Georges, the depth will be from seventy to ninety fathoms, "blue and green mud;" but to the southward of this it gradually decreases until, at the turning point of the course, twenty-three fathoms, "fine white sand and broken shells," are found. From this position, which is in **Latitude 41° 12' 30'' N., Longitude 69° 24' 20'' W.**, the course for Davis' South Shoal Light-vessel is **SW. by W. ¾ W.**, following the directions given above.

VIII. *A vessel from the Bay of Fundy, wishing to pass outside the Shoals by the passage leading to Davis' South Shoal Light-vessel,* should take her departure with Bryer's Island Light-house bearing **E.**, nine miles distant, with a depth of one hundred fathoms, muddy bottom, and steer **SW. ¼ W.**, on which course she will first shoal the water to sixty fathoms, with Cape St. Mary bearing **E. ½ N.**, thirty miles distant, and will then gradually increase the depth to one hundred and twenty-five fathoms, which will be found in **Latitude 42° 54' N., Longitude 67° 44' W.** From this position the depth will gradually decrease, although it does not fall below ninety-three fathoms, until in **Latitude 42° N.**,

Sailing Direc- Longitude $68^{\circ} 37' 15''$ W., when the depth will be eighty-eight fathoms, "blue mud
tions---Nan- and sand," and Cape Cod or Highland Light-house will bear W. by N. $\frac{1}{4}$ N., sixty-
tucket Shoals. three miles distant, and the shoal of The Georges SE. by E., forty-one miles distant.

This is the nearest point to George's Bank on this course, which passes thirty miles to the westward of Cultivator Shoal,—the soundings varying from sixty to eighty-five fathoms,—until in Latitude $41^{\circ} 25' N.$, Longitude $69^{\circ} 11' 40'' W.$, when the depth will be forty-seven fathoms, "grey sand, gravel and broken shells," with Sankaty Head Light-house bearing W. $\frac{1}{8}$ S., distant a little over thirty-five miles. From this position the soundings gradually decrease until the turning point in the course is reached, in Latitude $41^{\circ} 12' 30'' N.$, Longitude $69^{\circ} 24' 20'' W.$, when the depth will be twenty-three fathoms, "fine white sand and broken shells," and the course for Davis' South Shoal Light-vessel is SW. by W. $\frac{3}{8}$ W., following the directions given on page 180.

But, wishing to pass clear outside of Phelps' Bank and thence to the Westward: With Bryer's Island Light-house bearing E., nine miles distant, as before, SW. $\frac{1}{4}$ S. should be steered, which will pass twenty-five miles to the westward of the shoal of The Georges and fifteen miles to the westward of Cultivator Shoal. When in the latitude of The Georges, the depth will vary from seventy-five to one hundred and twenty fathoms,—the bottom being "mud and green ooze;" and when to the southward of Cultivator Shoal, the soundings will decrease with great regularity until the turning point in the course is reached, to the southward of Phelps' Bank, in Latitude $40^{\circ} 40' N.$, Longitude $69^{\circ} 19' W.$ Here the depth will be thirty-two fathoms, "fine grey sand and black specks,"—Davis' South Shoal Light-vessel bearing NW. $\frac{1}{4}$ W., twenty-eight miles distant, and Sankaty Head Light-house NW. by N. $\frac{1}{2}$ N., forty-seven and a half miles distant. From this position NW. by W. $\frac{1}{4}$ W. will lead to Point Judith; W. by N. $\frac{3}{8}$ N. to Montauk Point; W. $\frac{3}{8}$ N. to Sandy Hook Light-vessel; and W. by S. $\frac{1}{2}$ S. to the light-vessel on Five Fathom Bank, at the entrance to Delaware Bay.

The above courses pass a little over five miles to the eastward of the northern end of Phelps' Bank, in forty-two fathoms water, and six miles to the eastward of Asia Rip, in about thirty-five fathoms.

IX. *A vessel falling in with Cape Sable,* and taking her departure with the light-house bearing N., distant ten miles, should, if wishing to pass to the northward of The Georges, steer W. by S. $\frac{1}{2}$ S., on which course she would pass twenty-six miles to the northward of the shoal of the bank, in from one hundred to one hundred and ten fathoms, "blue mud," and twenty-three miles to the northward of Cultivator Shoal, in from ninety to one hundred fathoms, "dark mud and gravel," alternating with "blue mud and sand." On this course, when in Latitude $41^{\circ} 49' N.$, Longitude $68^{\circ} 48' 20'' W.$, with a depth of eighty fathoms, "green mud," SW. $\frac{1}{4}$ W. should be steered if desirous of passing through the channel to Davis' South Shoal Light-vessel, or SW. by S. $\frac{3}{8}$ S. if intending to pass outside of Phelps' Bank. *In the former case* the depth will be found gradually to diminish until the turning point in the course is reached, in Latitude $41^{\circ} 12' 30'' N.$, Longitude $69^{\circ} 24' 20'' W.$, where the depth will be twenty-three fathoms, "white sand and broken shells," and Sankaty Head Light-house will bear W. NW., twenty-five and a half miles distant. From this position the course is SW. by W. $\frac{3}{8}$ W. for twenty-six miles, crossing the tail of Davis' Bank in six fathoms and leading up to Davis' South Shoal Light-vessel; after which the directions given on page 180 must be followed.

In the latter case, (that is, if intending to pass to the Eastward of Phelps' Bank,) when in Latitude $41^{\circ} 49' N.$, Longitude $68^{\circ} 48' 20'' W.$, as before, SW. by S. $\frac{3}{8}$ S. should be steered, which will pass a little over thirty miles to the westward of Cultivator Shoal in from seventy to eighty fathoms, "green mud and fine sand," which depth will continue until in Latitude $41^{\circ} 22' N.$, Longitude $68^{\circ} 59' W.$, when the depth will begin to diminish,—forty-one fathoms, "coarse grey sand and broken shells" being found in Latitude $41^{\circ} 13' N.$, Longitude $69^{\circ} 0' 50'' W.$, with Sankaty Head Light-house bearing W. by N., distant nearly forty-three miles. To the southward of this position the soundings will range from thirty to forty fathoms until the turning point in the course is reached, in Latitude $40^{\circ} 40' N.$, Longitude $69^{\circ} 19' W.$, where the depth will be thirty-two fathoms, "fine grey sand and black specks," with Davis' South Shoal Light-vessel bearing NW. $\frac{1}{4}$ W., twenty-eight miles distant, and Sankaty Head Light-house NW. by N. $\frac{1}{2}$ N., forty-seven and a half miles distant. From this position NW. by W. $\frac{1}{4}$ W. will make Point Judith; W. by N. $\frac{3}{8}$ N. will lead to Montauk Point; W. $\frac{3}{8}$ N. to Sandy Hook Light-vessel; and W. by S. $\frac{1}{2}$ S. to the light-vessel on Five Fathom Bank.

But, if it is desired to pass to the Eastward of The Georges: When Cape Sable Light-house bears **N.**, distant ten miles, as before, a **SW.** course will lead thirty-two miles to the southeastward of the shoal of the bank, crossing Stellwagen's Shoal Ground in from twenty-three to thirty fathoms, "fine white sand;"—and here, it may be remarked that if the lead brings up no shells in crossing this bank it is an indication that the vessel is sufficiently far to the eastward and southward to be in no danger from the shoal or from the strong currents which exist in its vicinity. On the **SW.** course, when in Latitude $41^{\circ} 18' 20''$ **N.**, Longitude $67^{\circ} 11'$ **W.**, the depth will be about twenty-five fathoms, "fine white sand,"—Sankaty Head Light-house bearing **W.** by **N.**, one hundred and twenty-five miles distant, and Davis' South Shoal Light-vessel **W.** $\frac{1}{4}$ **N.**, one hundred and twenty-two miles distant. The course is now **W.** by **S.**, carrying from twenty-five to thirty-nine fathoms, the bottom being "fine white sand and pebbles," and "fine dark sand and gravel," until the turning point in the course is reached, in Latitude $40^{\circ} 40'$ **N.**, Longitude $69^{\circ} 19'$ **W.**, where the depth will be thirty-two fathoms, "fine grey sand and black specks," with Davis' South Shoal Light-vessel bearing **NW.** $\frac{1}{4}$ **W.**, twenty-eight miles distant, and Sankaty Head Light-house **NW.** by **N.** $\frac{1}{2}$ **N.**, forty-seven and a half miles distant. From this position **NW.** by **W.** $\frac{1}{4}$ **W.** will lead to Point Judith; **W.** by **N.** $\frac{3}{8}$ **N.** to Montauk Point; **W.** $\frac{3}{8}$ **N.** to Sandy Hook Light-vessel; and **W.** by **S.** $\frac{1}{2}$ **S.** to the light-vessel on Five Fathom Bank, at the entrance to Delaware Bay.

For vessels coming from the *westward* it is of course only necessary to *reverse* the above courses.

In thick or foggy weather, it is difficult to give any regular rules for approaching Nantucket Shoals either to the northward or southward of George's Bank. The experience of the ship-master in adjusting his dead-reckoning, a careful con of the ship, and a frequent use of the lead, will enable him to keep clear of all danger until the weather clears and he is able to determine his position. The chart should also be carefully and frequently inspected with a view to verifying the estimated position by the soundings taken; and attention is again called, in this connection, to the remark previously made, that the absence of shells in the specimens brought up by the lead, when passing to the southward of The Georges, is a sure indication of being clear of all danger from that bank or its currents. In passing to the northward of George's Bank the depth is an equally sure guide,—a safe rule being not to pass in less than seventy-five fathoms. Bringing up "blue mud" with such a depth shows that the vessel is well to the northward of the bank.

CURRENTS ON NANTUCKET SHOALS AND IN THEIR VICINITY.

The observations made in this vicinity, upon the set and velocity of these currents, have been ably discussed by Assistant Charles A. Schott, of the Coast Survey; and from his report upon the subject the following extracts are made:

"The general features of the current across the Shoals are as follows: The ebb commences a short time before the high-water stand on the shore of Nantucket takes place, and runs a little to the eastward of **S.**, with no indication of slack water. It then attains gradually its greatest velocity in a direction to the westward and southward; after which it slackens (the minimum velocity being about one-fourth the maximum) and runs a little to the westward of **N.**, and then in an opposite direction to that of the ebb,—thus completing an entire circuit. The current may be observed to set in all directions of the compass during twelve lunar hours, without ever being at rest; and turning from **S.** around by **W.** to **N.**, and then by **E.** to **S.** again, or like the hands of a watch."

The general direction of the current is that of the shore, except near Old South Shoal, where the set has a tendency in the direction of the longest line of the shoals. For nearly three hours, about the time of greatest velocity, the current deviates but little in direction. The average direction and greatest velocity of flood and ebb are so nearly opposite that they may be taken as exactly so, as will be seen by a reference to the "Table of Directions" given below; from which it will appear that to the northward of Pollock Rip the set of flood is to the eastward of **NE.** and that of ebb a little to the westward of **SW.**; while between McBlair's Shoal and The Rose and Crown the set of flood is to the northward of **NE.**, and that of the ebb to the southward of **SW.**; and this is true also to the southward of Davis' Bank, or, in other words, in the passage leading across the tail of that bank to Davis' South Shoal Light-vessel. To the eastward of Fishing Rip the flood at its greatest velocity runs **NE.** four miles an hour, and the ebb **SW.** three and a half miles an hour,—these being the greatest velocities observed on the Shoals. The mean interval between the time of the Moon's transit and the time of high water (or, in other words, the mean tidal establishment) at Siasconsett is about $11^h 33^m$, as will be seen in the table of Tides subjoined; and the current in the vicinity of Great Rip, which is pretty nearly the centre of the Shoals, changes $1^h 11^m$, on the average, before the water begins to fall or rise at Siasconsett. Mr. Schott's discussion leads to the practical conclusion that a vessel cannot be set upon any of the shoals by the current alone, if the distance from them exceeds nine nautical miles. A table of Current Establishments is herewith subjoined, which gives the interval of time between the Moon's meridian passage and the maximum velocity of the current on different parts of the Shoals.

ATLANTIC COAST PILOT.

TABLE SHOWING MEAN INTERVAL BETWEEN TIME OF MAXIMUM VELOCITIES OF FLOOD AND EBB, AND MOON'S MERIDIAN PASSAGE NEXT PRECEDING.

LOCALITY.	Current Establishment, Ebb.	
	h.	m.
Between McBlair's Shoal and Great Point	10	28
Four miles NE. of Fourteen Feet Shoal*	10	41
East side of Bass Rip	10	33
Three miles to the northward of Old South Shoal	11	13
Ten miles to the westward of Old South Shoal	12	0
East side of Old South Shoal	11	21 ⁺ 7
East side of Great Rip	10	22
Two miles NE. of Davis' South Shoal	12	0
Midway between Fishing Rip and Davis' Bank	10	47
Mean Duration of Current of Ebb	6	0

TABLE SHOWING TIMES OF CHANGE IN DIRECTION OF THE TIDAL CURRENT ON NANTUCKET SHOALS

LOCALITY OF OBSERVATIONS.	Current turns, after Moon's Meridian passage—		Duration of Current.	
	From N. to S.	From S. to N.	S.	N.
	h. m.	h. m.	h. m.	h. m.
Channels on either side of Great Rip	10 30	16 30	6 0	6 0
Between Davis' Bank and Fishing Rip	10 30	16 30	6 0	6 0
	E. to W.	W. to E.	W.	E.
At Davis' South Shoal Light-vessel	12 0	18 30	6 0	6 0

TABLE SHOWING DIRECTION AND VELOCITY OF CURRENT AT MAXIMUM FLOOD AND EBB ON NANTUCKET SHOALS.

LOCALITY.	Flood Current.		Ebb Current.	
	Direction.	Velocity.	Direction.	Velocity.
North of Pollock Rip	NE. by E. $\frac{1}{2}$ E.	0.8	SW. $\frac{1}{2}$ W.	1.2
Between McBlair's Shoal and The Rose and Crown	NE. by N. $\frac{1}{2}$ E.	1.5	SW. $\frac{1}{2}$ S.	1.5
Near Point Rip	NE. by E. $\frac{3}{4}$ E.	1.4	W.	1.2
Between Point Rip and McBlair's Shoal	NE. $\frac{1}{2}$ E.	1.7	W. by S. $\frac{1}{2}$ S.	1.9
Five miles E. of Twelve Feet Shoal	NE. by N. $\frac{1}{2}$ N.	1.5	SW. by S.	1.5
Four miles E. of Fourteen Feet Shoal*	NNE.	2.0	SSW.	1.8
Channel W. of Great Rip	NE. by E. $\frac{1}{2}$ E.	1.8	SW. by S. $\frac{1}{2}$ S.	2.1
Channel E. of Great Rip	N. by E. $\frac{1}{2}$ E.	2.2	S. by W. $\frac{1}{2}$ W.	2.3
Ten miles to westward of Old South Shoal	E. $\frac{1}{2}$ N.	1.5	W. $\frac{1}{2}$ N.	1.5
Three miles to northward of Old South Shoal	E. by S.	1.7	W. $\frac{1}{2}$ S.	1.6
Channel E. of Davis' Bank	NE. by N. $\frac{1}{2}$ N.	2.8	SW. by S.	2.2
Western side of Fishing Rip	NE. by E. $\frac{1}{2}$ E.	3.5	SW. by W.	2.3
Eastern side of Fishing Rip	NE.	4.0	SW.	3.5
In Channel at southern end of Davis' Bank	NNE.	2.8	SSW.	2.0

TIDES.

	Monomoy.	Great Point.	Siasconsett.
Corrected Establishment	11 ^h 56 ^m	12 ^h 6 ^m	11 ^h 33 ^m
Mean Rise and Fall of tides	3.8 ft.	3.4 ft.	2.2 ft.
Mean Rise and Fall of Spring tides	5.3 ft.	4.6 ft.	2.8 ft.
Mean Rise and Fall of Neap tides	2.6 ft.	2.4 ft.	1.4 ft.
Mean duration of Rise	6 ^h 25 ^m	6 ^h 30 ^m	5 ^h 50 ^m
Mean duration of Fall	5 ^h 59 ^m	5 ^h 54 ^m	6 ^h 13 ^m
Mean duration of Stand		0 ^h 8 ^m	0 ^h 14 ^m
Rise of highest tide observed	5.5 ft.	5.0 ft.	3.0 ft.

* Eldridge's New Eastern Shoal.

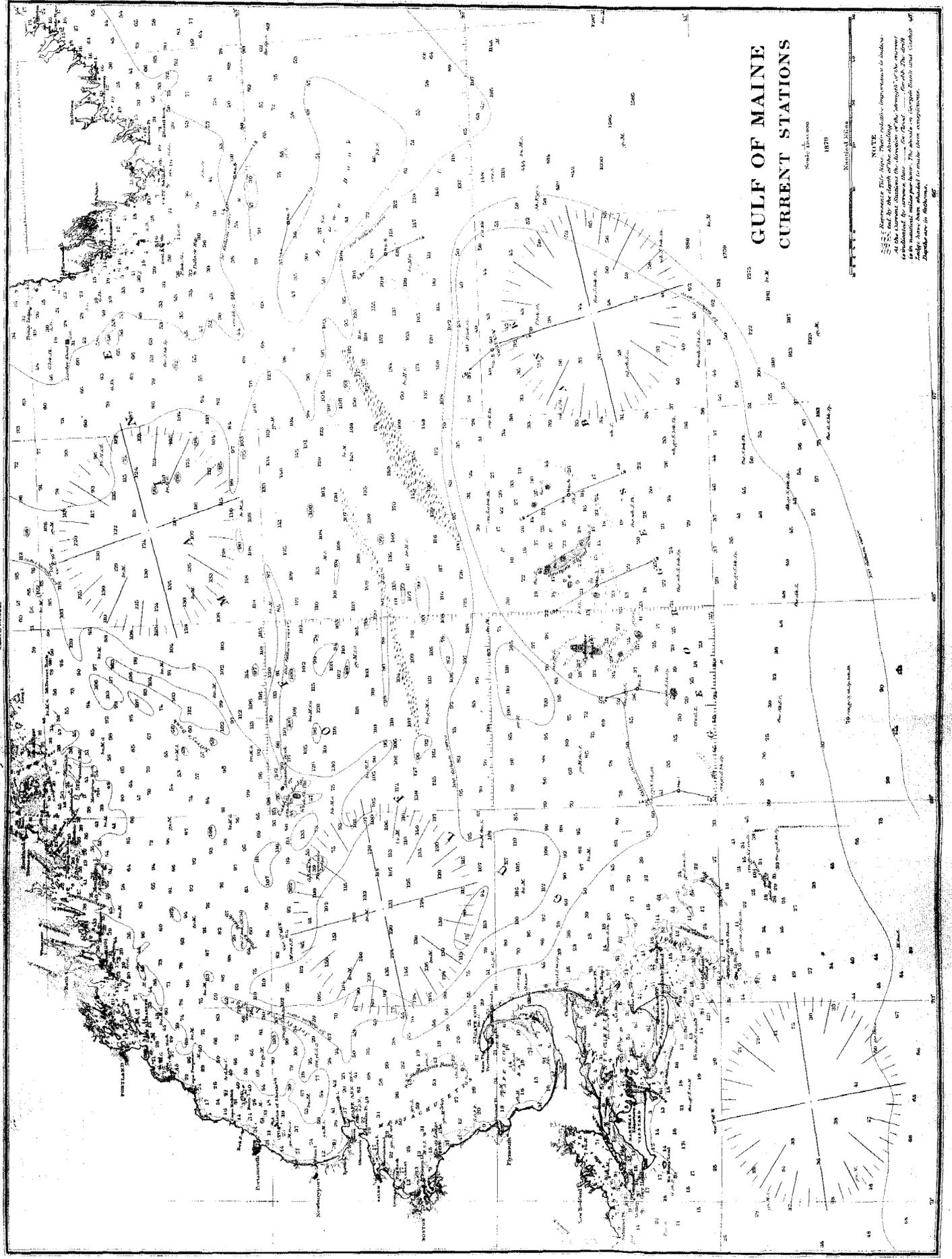
GULF OF MAINE CURRENT STATIONS

NOVEMBER 1929

NO. 1140

NAUTICAL MILES

NOTE: The above figure shows the relative importance of the stations in the Gulf of Maine. The stations are arranged in a regular grid, but the number of stations is not uniform. The stations are arranged in a regular grid, but the number of stations is not uniform. The stations are arranged in a regular grid, but the number of stations is not uniform.



LIGHT-HOUSES.

NAME.	Latitude.	Longitude West.		Fixed or Revolving.	Interval of Flash.	Height above sea-level.	Distance visible in nautical miles.
		In arc.	In time.				
	° ' "	° ' "	h. m. s.		m. s.	Feet.	
Nantucket Light-house	41 23 22	70 2 45	4 40 11	Fixed.		70	14
Sankaty Head Light-house	41 16 59	69 57 56	4 39 52	F. V. F.	1 0	150	19
Davis' South Shoal Light-vessel.	40 58 0	69 51 0	4 39 24	Fixed.		44	12

VARIATION OF THE COMPASS.

The magnetic variation for 1880 at Fishing Rip is 11° 10' W.; in the vicinity of Phelps' Bank, 10° 55' W.; and at Davis' South Shoal Light-vessel, 10° 40' W., with an annual increase of 2 1/4'.

ICE ON NANTUCKET SHOALS.

Except during very severe winters, no trouble is experienced on these shoals or in their vicinity from the presence of ice. During the winter of 1856-7 Davis' South Shoal Light-vessel was surrounded by quantities of "porridge ice," or "mush ice," (the name given to the cakes when they have been broken up into very small pieces by the sea;) and in 1875 the same thing again occurred. In this latter winter the ice, driven out of the Sounds through Muskeget Channel and around Great Point, was soon broken into "mush," and extended out to Davis' South Shoal Light-vessel and as far beyond it as could be seen from her mast-head. It was, of course, no obstruction to navigation.

BUZZARD'S BAY

is that large indentation in the southern coast of Massachusetts which runs in a northeasterly direction between the mainland on the north, the western extremity of the peninsula of Cape Cod on the east, and the Elizabeth Islands (which extend from Nobska Point to Cuttyhunk) on the south. It is about twenty miles long with an average width of a little over five miles, and has deep water throughout nearly its entire length and breadth. The entrance to this bay may be said to lie between Gooseberry Neck on the north and Cuttyhunk Point on the south; the distance between the two being five and a half miles, with a depth in mid-channel of from nine to twelve fathoms.

Gooseberry Neck is a narrow island, about five-eighths of a mile long, with an average width of three hundred and fifty yards, lying about three hundred yards from the mainland (to which it is joined at low water) and two and a quarter miles to the southeastward of the entrance to Westport River. It will appear as very gently sloping, cleared land of moderate height, with occasional groups of houses and clumps of trees. It is surrounded by very dangerous shoals,—those extending to the southward, and known as **The Hen and Chickens**, being especially dreaded. These shoals make in a southerly direction for a mile and a quarter, and a light-vessel is placed to the southward of them, in mid-channel, to mark the entrance to the bay.

Cuttyhunk Point is the western extremity of **Cuttyhunk Island**,—the westernmost of the Elizabeth group, (see page 89,) and will appear on approaching the entrance as a high, steep, yellow sand head, with a peculiar hollowed surface behind and to the eastward. At the base of the head, on its northern side, stands a white light-tower and two or three dwelling houses. The eastern end of the island, when seen from the bay, rises to a bare, high and rugged summit, having a peculiar brown color even in summer. Cuttyhunk Light-house is a low tower on the keeper's dwelling, (both painted white,) and shows a fixed white light, of the fifth order, from a height of forty-two feet above the sea, visible twelve miles. Its geographical position is

Latitude ----- 41° 24' 50" N.
Longitude ----- 70° 58' 59" W.,

and it bears from

	Miles.
Gay Head Light-house, NW. 1/4 N. -----	6 1/4
Dumpling Rock Light-house, S. by W. 1/4 W. -----	7 1/2
Hen and Chickens Light-vessel, SE. 1/4 E. -----	3 1/4
Brenton's Reef Light-vessel, E. by S. 1/4 S. -----	nearly 19 1/2
Point Judith Light-house, E. 1/4 S. -----	a little over 24
Block Island North Light-house, E. by N. -----	30 1/2
Block Island Southeast Light-house, E. by N. 1/4 N. -----	31

There is no fog-signal.

A long reef, known as **Sow and Figs Reef**, makes off in a westerly direction from Cuttyhunk for a mile and three-eighths; and one mile SW. by S. from its western end is placed a light-vessel, known as **Vineyard Sound Light-vessel**. She is schooner-rigged, her hull painted red with a yellow streak, with the words "Vineyard Sound" in large letters on each side; and carries a red hoop-iron day-mark at each mast-head. She shows two fixed white lights from a height of thirty-four feet above the sea, visible eleven miles; and for a fog-signal a steam

whistle of the first class gives blasts of six seconds duration, followed by intervals of forty-five seconds. The vessel is anchored in thirteen and a half fathoms, in

Latitude ----- 41° 23' 0" N.
Longitude ----- 70° 59' 0" W.,

and from it Cuttyhunk Light-house bears **NE.** by **E.** **Northerly**, distant two miles and a half, and Hen and Chickens Light-vessel **N.** by **W.** **Northerly**, distant three miles and three-quarters.

Hen and Chickens Light-vessel is anchored in ten fathoms water, nearly in the middle of the entrance to the bay, and a little to the northward of the sailing-line. It has also two masts, with a black hoop-iron day-mark at the main-mast head. The hull is painted lead color, with the words "*Hen and Chickens*" on each side. It shows a fixed white light from a height of thirty-five feet above the sea, visible eleven miles; and for fog-signal has a bell and horn. Its geographical position is

Latitude ----- 41° 27' 0" N.
Longitude ----- 71° 1' 0" W.,

and it bears from

	Miles.
Brenton's Reef Light-vessel, E. $\frac{1}{4}$ S. -----	16
Point Judith Light-house, E. $\frac{3}{4}$ N. -----	21 $\frac{1}{2}$
Block Island North Light-house, E. by N. $\frac{1}{4}$ N. -----	nearly 28
Block Island Southeast Light-house, NE. by E. $\frac{1}{4}$ E. -----	29 $\frac{1}{2}$
Vineyard Sound Light-vessel, N. $\frac{1}{2}$ W. -----	3 $\frac{1}{2}$
Cuttyhunk Light-house, NW. $\frac{1}{4}$ W. -----	3 $\frac{1}{2}$

From this light-vessel Dumpling Rock Light-house bears **NE.** $\frac{1}{4}$ **E.**, six miles and seven-eighths, and the buoy on Wilkes' Ledge **NE.** by **E.** $\frac{1}{4}$ **E.**, six miles and an eighth distant.

In coming into the bay, when up with the Hen and Chickens Light-vessel Mishaum Point will appear bearing about **NE.** five miles distant, and looking like a smooth grassy hill with precipitous sandy faces; and nearly in range, but a little to the southward of it, Dumpling Rock Light-house will be seen as a white tower on top of a dwelling of the same color, apparently standing in the water.

NORTH SHORES OF BUZZARD'S BAY.

To the eastward of Gooseberry Neck the course of the northern shore of the bay is about **E.** $\frac{1}{2}$ **N.**, for nearly three miles to Barney's Joy Point, the western point of entrance to Slocum's River. The land appears to be of moderate height, very gently sloping, cleared and cultivated, dotted with houses and occasional groves of trees. Barney's Joy Point is a somewhat broad,

grassy point, bare of trees, of moderate height, of gentle slope, and under cultivation. Shoal water extends from it to the southward for nearly half a mile, and it is not advisable for strangers to pass between this and Mishaum Ledge, which lies a mile and a quarter to the southeastward of the point. As above mentioned, it is the western point of entrance to Slocum's River, a shallow stream of little importance, making in to the northward between this point and Mishaum Point,—being a mile and a quarter wide between the two, and contracting very gradually in width, as it advances to the northward, for about a mile, where a long point suddenly juts out from the eastern bank, diminishing the width to about four hundred yards. The entrance has many sunken rocks, (which are not buoyed) is very dangerous, and not fit for strangers.

Mishaum Point, the eastern point of entrance to this river, lies four and a quarter miles to the eastward of Gooseberry Neck, is long and narrow, with level grassy surface and precipitous sandy faces,—at the base of which are strewn many large boulders. It is steeper than Barney's Joy Point,—the shoal water extending not more than four hundred yards to the southward.

To the eastward of Mishaum Point the shore turns abruptly to the northward for about five-eighths of a mile, forming the eastern side of the point; and then to the eastward, running about **ENE.** for about six hundred yards to Salter's Point. Salter's Point, low and gently sloping, with a group of houses just back of it. Shoal water extends all about this shore, and there are sunken rocks as much as three-quarters of a mile to the southeastward of the point so that it is not safe to go to the westward of Dumpling Rock Light-house bearing **NE.** $\frac{1}{4}$ **E.**

From Salter's Point to Round Hill Point the northern shore of the bay forms another wide but shallow cove,—the distance between the two points being about one mile. The land is all low and nearly level and for the most part under cultivation.

Round Hill Point is the western point of entrance to the wide bay contained between it and Scout Neck; and out of which open the harbors of Padanaram, Clark's Cove and New Bedford. It is a little over a mile and three-quarters to the north

eastward of Mishaum Point; six miles and three-quarters from Hen and Chickens Light-vessel; and Round Hill Point receives its name from Round Hill, a very remarkable round grassy hillock, with precipitous face on its southwestern side, which rises abruptly from the low flat land surrounding it,—there being nothing like it in this vicinity. Round Hill becomes visible to vessels bound up the bay when a little over a mile to the eastward of the Hen and Chickens Light-vessel, when it will open out from behind Mishaum Point, bearing **NE.** $\frac{1}{4}$ **E.** It is one of the landmarks in the approach to New Bedford.

Off Round Hill Point lie **Dumpling Rocks**, or **The Dumplings**,—a line of bare, rugged rocks, extending about six hundred yards from shore and surrounded by shoal water. On the outermost rock, which is much the highest and largest, forming a kind of islet, is built the light-house, called **Dumpling Rock Light-house**, which marks the western point of approach to New Bedford Harbor. It is a low white tower on the keeper's dwelling, (which is of the same color,) and shows a fixed white light, of the fifth order, from a height of forty-two feet above the sea, visible twelve miles. Its geographical position is

**Dumpling Rock
Light-house.**

Latitude ----- 41° 32' 18" N.
Longitude ----- 70° 55' 18" W.

Near the light-house stands the bell-tower, in which, during thick weather, a **fog-bell** is struck twice in quick succession, alternately with a single blow, at intervals of thirty seconds.

Dumpling Rock Light-house bears from

	Miles.
Hen and Chickens Light-vessel, NE. $\frac{1}{2}$ E. -----	6 $\frac{1}{4}$
Cuttyhunk Light-house, N. by E. $\frac{1}{4}$ E. -----	7 $\frac{1}{2}$
Entrance to Quick's Hole, N. by W. $\frac{1}{4}$ W. -----	5 $\frac{1}{2}$

From it Clark's Point Light-house bears **NE.** by **N. $\frac{1}{4}$ N.**, three miles and a quarter, and the entrance to Wood's Hole **E.** by **S. $\frac{1}{4}$ S.**, ten miles distant.

SOUTH SHORES OF BUZZARD'S BAY.

On the southern side of Buzzard's Bay will be seen the **Elizabeth Islands**, which, beginning at the westernmost, are named Cuttyhunk, Nashawena, Pasque, Naushon, Uncatena, and Nonamesset. **Cuttyhunk Island** has been already described on page 89. About seven-eighths of a mile **NNE.** from its eastern end will appear Penikese Island, a small island of irregular shape and about half a mile in diameter, bold-to on its northern side, but dangerous of approach from the southward on account of the numerous sunken ledges and rocks between it and Cuttyhunk Harbor. Seen from the northwestward it will appear as a barren island of moderate height and undulating surface, dotted with boulders. The northern shore will appear somewhat steep, and several buildings will be seen near the southwestern end. These belong to the **Anderson School of Natural Science**, and are on the shore of the little harbor on the southern side of the island.

Penikese Island.

Cuttyhunk Island is separated on the east by a very narrow and shoal passage, called **Canapitsett Gut**, from Nashawena Island, which will appear, when viewed from the northward and westward, high and bare, (being covered only with grass,) and having a somewhat undulating and irregular outline, which appearance is caused by **Nashawena Island**, the great number of sand hills, of which the island is composed. It lies nearly **E.** and **W.** and is two miles and a half long,—its northeastern extremity extending into a long, low, sandy point, faced with innumerable boulders. This is the northwestern point of entrance to **Quick's Hole**.

Between the western end of Nashawena and the eastern end of Cuttyhunk Island is formed a snug cove, about three-quarters of a mile wide, called **Cuttyhunk Harbor**, affording good anchorage in from two to four fathoms, although somewhat exposed to winds from the northeastward. It is sheltered on the north by **Penikese Island** and **Cuttyhunk Harbor**, the shoals connecting that island with **Gull Island**, (a low islet three-eighths of a mile to the southeastward of **Penikese**,) and is not infrequently used by weather-bound vessels.

Nashawena Island is separated on the east from **Pasque Island** by a passage three-quarters of a mile wide, called **Quick's Hole**,—a very commonly used thoroughfare between the bay and Vineyard Sound. It has from five to eight fathoms in the channel, and its few obstructions are well buoyed, so that it is safe for strangers to pass through it. Its northern entrance bears from **Dumpling Rock Light-house S.** by **E. $\frac{1}{4}$ E.** and from **Clark's Point Light-house S. $\frac{1}{4}$ E.** A full description of this passage is given on pages 156-158.

Pasque Island lies **E.** by **S.** and **W.** by **N.**, is a mile and a half long, and when viewed from the northward presents the same general characteristics as **Nashawena Island**,—being of considerable height, with rugged outline, grassy surface, and entirely bare of trees. On the east it is separated from **Naushon Island** by a narrow and dangerous passage called **Robinson's Hole**. This passage, which leads from the bay into Vineyard Sound, is about half a mile wide at its northern entrance, but rapidly diminishes in width to two hundred yards, is full of dangerous rocks, and unsafe for strangers. (See also page 88.)

Pasque Island.

Naushon Island, the largest of the **Elizabeth** group, lies nearly **ENE.** and **WSW.**, and is between five and six miles long, with an undulating surface, diversified with woods, grassy hills, and occasional cleared fields. The centre of the island is composed entirely of sand hillocks covered with grass, while the western end is mostly wooded, and the eastern partly wooded and partly composed of groups of sand hillocks covered only with grass.

Uncatena Island, which lies close in with the northeastern point of **Naushon**, and is connected with it by a bridge, is a small, low, grassy island, about five-eighths of a mile long in a nearly **E.** and **W.** direction. It forms the northwestern point of entrance to **Wood's Hole**,—the easternmost of the thoroughfares between Buzzard's Bay and Vineyard Sound, separating the **Elizabeth Islands** from the western end of the peninsula of **Cape Cod**. Here the southern shores of the bay terminate and the eastern shores begin, having a general course **N.** by **E.** to **Wing's Neck**, at its head.

Uncatena Island.

EAST SHORES OF BUZZARD'S BAY.

The northeastern point of entrance to Wood's Hole is known as **Long Neck**, and is, in reality, an island, although joined to the mainland by a causeway. It will appear as a long grassy head, somewhat undulating, entirely bare of trees or bushes, and having precipitous sandy faces. The houses, which are visible over the neck, are on its southern side, and on Bar Neck in Wood's Hole, and there is usually some shipping visible in Great Harbor.

From the eastern end of Long Neck the shore runs **NE.** for seven-eighths of a mile to Quisset or Quamquisset Harbor, a small cove of irregular shape, and about five-eighths of a mile long, with an average width of four hundred yards. It first runs about **E. by N.** and then **NE. by E.** to its head, is quite shoal, full of sunken rocks, and the entrance is obstructed by very dangerous reefs which make off from both sides; so that it is entirely unsafe for strangers to enter it. Seven feet at mean low water may be taken into this harbor through a very narrow and crooked channel, obstructed by sunken rocks, which are not buoyed. The ledges at the entrance, however, are both marked, and there is also a buoy on **Lone Rock**,—a very dangerous sunken rock in the middle of the harbor.

The entrance to Quisset is easily recognized by its northeastern point, called East Point. It is a very peculiar looking precipitous sandy head, about forty feet high, and entirely bare of trees; while the shore to the northward of it is low, flat and grassy, extending back to high hills, partly wooded and partly cleared, with a few houses upon their summits. The southwestern point of entrance to Quisset is known as West Point, and is undulating, presenting a low, level surface, with sandy face, lined by boulders. Behind the point the land rises somewhat steeply, covered with low scrub and bushes, and backed by thick dark woods, which crown the summit of the ridge.

From East Point the eastern shore of Buzzard's Bay runs **N NE.** for a mile and three-eighths to **Gunning Point**,—the land being low, cleared, nearly level, and backed by trees. Hence to **Hamlin Point**, three-eighths of a mile above, it turns to the eastward and then to the northward, forming a small cove of no importance.

From Hamlin Point it again turns to the westward for about six hundred yards, and then runs **N. $\frac{1}{2}$ W.** for nearly two miles to Hog Island Point, the southern point of entrance to the harbor of the same name. The land between Gunning Point and Hog Island Point is low, cleared, and nearly level, except on the beach to the southward of the entrance to Hog Island Harbor, which is composed of small sand hillocks. Hog Island Point is remarkable for a twin hillock, high, round and bare, with a single large black-looking cedar on its top and a group of low trees near its northern end. The northern point of entrance to the harbor is equally remarkable,—showing a high, steep, grassy hill, whose southern face is perpendicular. Over the surface are scattered boulders, which at a distance have the appearance of cattle. It is called **Little Island Point**.

Hog Island Harbor is a large cove of irregular shape, penetrating the eastern shore of the bay first in an easterly direction for about seven hundred yards, and then about **S. by W.** for half a mile to its head. On its eastern shore, some distance back from the bank, is built the village of **West Falmouth**,—a small place, of little importance. The harbor is shoal, the entrance narrow, (being only about three hundred yards wide,) and not more than five feet at low water can be taken into it. The entrance is also obstructed by dangerous ledges which render an approach to it unsafe for strangers.

From Little Island Point the course of the shore is very irregular, but the general direction is **N NE.** as far as Wild Harbor, a mile and a half above. The land is undulating, showing sometimes low sandy faces, backed by higher lands covered with scrub, and in other places (as near Hog Island Harbor) high, steep, bluff points, with grassy slopes, and summits covered with a dense growth of low trees.

Wild Harbor is a small nearly circular cove, about six hundred and fifty yards in diameter, making in on the southern side of Nye's Neck, and affords excellent anchorage in from six to fifteen feet at low water. Its southern point of entrance is about twenty feet high, with flat summit and perpendicular sandy faces, with wooded lands occupying the background. The shore at the head of the harbor shows low sand hillocks, faced by a fine white sand beach covered with thin beach grass, and backed by somewhat higher land, partly cleared and partly covered with scrub and bushes. The houses and steeples in the village of **North Falmouth** are seen over the low lands.

Wild Harbor is entirely unobstructed, and may be safely entered by strangers by keeping midway between its northern and southern points of entrance.

Nye's Neck, which separates Wild Harbor from Cataumet Harbor, is composed of gently sloping, low, cleared lands, with sandy faces strewn with boulders, and summits covered with the usual growth of bushy trees. Its southwestern extremity, called **Nye's Neck Point**, is flat and grassy, with steep sandy faces, protected by a line of rocks at their base. A solitary house stands near the middle of the point.

Cataumet Harbor is a large cove contained between Scraggy Neck on the north and Nye's Neck on the south, and affords excellent anchorage in from two to three fathoms, soft bottom; but the entrance is crossed by a bar with nine feet at mean low water. The harbor runs **E. $\frac{1}{2}$ N.**, is about a mile and a quarter long, nearly a mile wide at its mouth, with an average width of five-eighths of a mile, and is an excellent anchorage in all winds. **Scraggy Neck**, which forms the northern shore of the harbor, is an island at high water,—being connected with the mainland by a reef dry at low water. Viewed from the southward it shows cleared gently sloping lands, crowned with thick woods, while its western face appears somewhat steep and rugged, with a scant growth of grass, backed by thick bushy trees. It separates Cataumet Harbor from Pocasset Harbor, which makes in on its northern side.



Tempe's Nob, (Bussard's Bay), bearing NE, distant 24 Miles.



Marion Ho.

Great Hill, (Bussard's Bay), Marion House bearing N, distant 54 Miles.

At the head of Cataumet Harbor the land is undulating,—being in some places steep, with sandy faces, and in others low, flat, or gently sloping, cleared and cultivated, and backed by thick woods. The remarkable hill known as **Tempe's Nob** will be visible from this part of the bay, showing over the lower lands as a thickly wooded hill of a saddle-like appearance, having at its eastern end and near its base yellow sand hillocks dotted with low black clumps. It is situated on the mainland on the western side of the entrance to Cohasset Narrows. (See View.)

The approach to Cataumet Harbor is further recognizable by two very tall trees appearing close together over the tops of the wooded hills; and with these trees bearing from **E. to E. by N.**, a direct course for them will lead to the mouth of the harbor.

Dangerous shoals lie off Scraggy Neck, and care should be taken, in approaching it from the westward, not to stand into less than four fathoms.

On the northern side of Scraggy Neck makes in a large cove or bay about a mile and three-quarters in length, but of such irregular shape as to render it impossible to give it an average width. It is contained between Wenaumet Neck on the north and Scraggy Neck on the south, and nearly in the middle lies a low sandy island, called **Bassett's Island**, separating the outer harbor, called **Pocasset Harbor**, from the inner, called **Red Brook Harbor**, which occupies the eastern half of the cove.

Wenaumet or Wing's Neck, which forms the northern side of Pocasset Harbor, is a peninsula a mile and three-quarters long in an **ENE.** and **WSW.** direction, and is of moderate height, with occasional perpendicular faces. It is covered with a dense growth of bushy trees, except at its western end, where it is grassy and terminates in a sandy head, about thirty feet high, with perpendicular faces. On the extremity of this point is built **Wing's Neck Light-house**. **Wing's Neck Light-house**, the guide to Pocasset Harbor and Cohasset Narrows. The lantern is on the keeper's dwelling, (a white house with red roof,) and shows a fixed white light, of the fifth order of Fresnel, from a height of forty-four feet above the sea, visible twelve miles. Its geographical position is

Latitude ----- 41° 40' 50'' N.
Longitude ----- 70° 39' 37'' W.,

and it bears from

	Miles.
Bird Island Light-house, E. $\frac{1}{2}$ N. -----	2 $\frac{3}{4}$
Angelica Point, (the northeastern point of entrance to Mattapoiset,) E. by N. $\frac{1}{2}$ N. -----	nearly 5 $\frac{1}{2}$
The southern end of West Island, NE. by E. $\frac{1}{2}$ E. -----	9
Hen and Chickens Light-vessel, NE. by E. $\frac{1}{2}$ E. -----	nearly 21
Entrance to Quick's Hole, NE. $\frac{1}{2}$ N. -----	about 15
The entrance to Wood's Hole, N. by E. $\frac{1}{4}$ E. -----	8 $\frac{1}{2}$

There is no fog-signal.

The southern side of Wenaumet Neck, which forms the northern shore of Pocasset Harbor, is thickly strewn with boulders, and a line of bare rocks extends from the base of the head at its western extremity. Scraggy Neck, on the southern side of the harbor, appears somewhat steep and rugged, and thickly covered with scrub to the edge of the bank.

Bassett's Island, which separates Pocasset from Red Brook Harbor, is low, flat and sandy, very irregular in shape, and three-quarters of a mile long in a **N.** and **S.** direction. The surface of the southern half is but little above high water, but near the middle are a few low scrubby trees, and the land rises to a hillock about twenty feet high,—having perpendicular sandy faces and crowned with a thick clump of trees. Thence to the northern end it descends gradually, showing steep sandy faces, with many boulders at the base, and terminates in a flat, cleared, grassy point, faced by **Bassett's Island**. The inner harbor of Pocasset is contained between Wenaumet Neck and the northern side of this island. The principal entrance to Red Brook Harbor leads from Pocasset Harbor around the northwestern point of the island, and thence along its eastern face, between it and the mainland, with not less than six feet in the channel at mean low water. There is another passage leading between the southern end of Bassett's Island and Scraggy Neck with four feet at mean low water.

Pocasset Harbor may be safely entered by strangers, and anchorage will be found in from two to four fathoms in the outer harbor, and from ten to fifteen feet in the inner. (See also description of this harbor.)

To the northward of **Wing's or Wenaumet Neck** is the head of Buzzard's Bay, containing a labyrinth of islets and intervening channels, through and among which Back River, Monumet River, and Cohasset Narrows are approached. Strangers must never attempt any of these passages without a pilot, as they are narrow, shallow, crooked, and full of dangers, of which no intelligible description can be given. The common entrance is between **Tempe's Nob** on the north (mentioned above) and **Wing's Neck**, on the south, and is a mile and a half wide from shore to shore, although the available channel, which lies close to **Wing's Neck**, ranges only from a quarter to half a mile in width, owing to the flats and shoals making off from the northern shore of the bay.

On the northern side of **Wing's Neck** the shore is very irregular in outline, but has a general course about **ENE.** for two miles and a quarter. For a little over a mile it is well wooded, but the rest of the land is low, nearly level, cleared and cultivated. Two miles from the western end of the neck is the mouth of a small, narrow and shallow stream leading up to the village of **North Pocasset**, and a quarter of a mile to the eastward of this the shore takes an abrupt turn, running nearly **N. $\frac{1}{4}$ E.** to the mouth of Back River,—a mile and three-eighths above. The land is undulating but not high, gently sloping, diversified with groves of trees, and cleared fields dotted with houses. About four hundred yards **N.** from the mouth of the small stream leading up to North Pocasset is the southern end of a long low island, of very irregular shape, known as **Tobey Island**, and sometimes

Bennet's Neck, which lies along the eastern shore, at an average distance of four hundred yards from it, except at its northeastern end, where it is joined to the mainland by a reef dry at low water. The island is five-eighths of a mile long in a N. by E. and S. by W. direction, and varies in width from one hundred and fifty yards at its southern, to four hundred and fifty at its northern end. Between the northern end and the mainland is formed a shallow semicircular cove, called **Phinney's Harbor**.

Back River is a shallow and very crooked stream, about two hundred yards wide at its mouth, but rapidly diminishing to about fifty yards a third of a mile above. Eleven feet may be taken into its mouth, and seven feet to the anchorage, two hundred and fifty yards inside; but the channel is narrow, crooked, and obstructed by the dangerous **Cow Rock** and

Back and Monument Rivers. **Phinney's Rock Ledges.** Nearly three-quarters of a mile to the northward of it, and separated from it by a low and nearly level peninsula, diversified with cleared lands and groves of trees, is the entrance to Monument River,—another narrow and shallow stream, which makes in an easterly direction for about a mile and three-eighths to the small settlement of **Monumet**. The northern side of the entrance is formed by a flat grassy peninsula known as **Bourne's Neck**, separating Monument River from Cohasset Narrows. The river is closed to navigation except at high water.

Cohasset Narrows are formed by an arm of the bay, having a general course about **NNE.**, but very crooked and shallow, with a very narrow channel, through which about five feet at low water may be taken into what is called **Buttermilk Bay**. The entrance is between Bourne's Neck on the east and a neck of level land on the west, with a few trees on its southern extremity, and backed by cultivated fields dotted with houses. This is

Cohasset Narrows. **Jacob's Neck.** A low flat islet, mostly grassy, but with a few trees on its southern end, lies about three hundred and fifty yards to the westward of the neck, nearly in the middle of another arm of the bay leading up to the village of **Agawam**. This is **Onset Island**, and long flats make out from it to the southeastward for half a mile. On the western side of this arm of the bay lies **Hog Neck**, a low and nearly level peninsula, with somewhat steep faces, partly

Hog Neck. wooded and partly cleared, and terminating to the eastward in a long low point, with a few trees upon it, off which, at a distance of two hundred yards, lies a small low island, about six hundred yards long and thinly wooded, called **Hog Island**. Ten feet at low water may be taken between the island and the neck, and nine feet between **Hog Neck** and **Onset Island** to a convenient anchorage in from ten to seventeen feet between **Onset Island** and a wooded islet known as **Wicket's Island**, three-eighths of a mile above.

Exactly in the middle of the entrance between **Tempe's Nob** and **Bennet's Neck**, and three hundred yards to the southward of **Hog Island**, lies a level grassy island, with a grove of trees on its southwestern side, called **Mashnee Island**. It is about three-eighths of a mile long in a N. and S. direction, and both it and **Hog Island** are surrounded by extensive flats, leaving a narrow and crooked channel on each side. The western channel (that which leads between this island and **Tempe's Nob**) takes not less than ten feet at low water as far up as **Onset Island**; while the eastern channel, leading between **Mashnee Island** and **Bennet's Neck**, carries twelve feet as far up as the mouth of **Back River** and nine feet to abreast of **Jacob's Neck**. The latter is well buoyed; but neither should be attempted without a pilot.

The northern shore of **Buzzard's Bay** is composed of low, nearly level land, diversified with cultivated fields and groves of trees, and backed by thick woods. From **Tempe's Nob** to **Warren's Point** (the eastern point of entrance to **Wareham River**) the general trend of this shore is **WNW.**, and the distance two miles and a half.

NORTHWEST SHORES OF BUZZARD'S BAY.

On the eastern side of **Round Hill** the shore turns abruptly to the northward, running about **N. $\frac{1}{2}$ W.** for nearly two miles to the mouth of **Apponagansett Bay**, or **Padanaram Harbor**. The land is quite low and flat, dotted with houses, and diversified with cleared and cultivated fields and groves of trees. The northern point of entrance to the bay is called **Rickettson's Point**, and is also the western point of entrance to **Clark's Cove**. It is quite low, partly wooded and partly cleared, and is the site of the small settlement of **Padanaram**. Good anchorage in from ten to fifteen feet is found in this harbor, and there are few obstructions.

Clark's Cove. **Clark's Cove** is a long indentation in the northern shore, running about **N. $\frac{1}{2}$ W.** for a mile and a half, with an average width of five-eighths of a mile and a depth of from nine to eighteen feet. Its western shore is composed of gently sloping land, cleared fields and woods alternating, while on its eastern side it is separated from the harbor of **New Bedford** by a nearly level peninsula almost entirely cleared and under cultivation, but showing occasional groves of trees.

The southern extremity of this peninsula is called **Clark's Point**, and is the western point of entrance to the harbor of **New Bedford**. It is occupied by a small granite fort, above the parapet of which will be seen a light-house; and a little to the eastward of the fort a white tower, from which the light was formerly shown. The city of **New Bedford** will be seen to the westward of the fort, over the low land at the head of **Clark's Cove**.

Scouticut Point. The eastern point of entrance to **New Bedford Harbor** is called **Scouticut Point**, and is the southern extremity of **Scouticut Neck**, which forms the eastern side of the outer harbor. The neck, including the point, is low, nearly flat, and for the most part thickly wooded except near the water-line, where cleared and cultivated fields dotted with houses are seen. **Scouticut Point** bears from **Clark's Point Light-house** **SE. by E. $\frac{1}{2}$ E.**, nearly two miles and a quarter distant. It is dangerous to approach it, as there are many outlying ledges off its southern end.

Clark's Point Light-house is a white tower on the summit of the fort, and shows a fixed white light, of the fifth order, from a height of sixty-eight feet above the sea, visible thirteen miles. Its geographical position is

Latitude ----- 41° 35' 32" N.
Longitude ----- 70° 54' 5" W.,

and it bears from

Miles.

Dumpling Rock Light-house, NE. by N. $\frac{1}{2}$ N. ----- a little over 3 $\frac{1}{2}$
Cuttyhunk Light-house, N NE. Nearly ----- 10 $\frac{1}{2}$
The entrance to Quick's Hole, N. $\frac{1}{2}$ W. Nearly ----- 8 $\frac{1}{2}$
The entrance to Wood's Hole, NW. by W. ----- nearly 10

There is no fog-signal. (See detailed description of New Bedford Harbor.)

On the eastern side of Sconticut Neck, from which it is distant at its nearest point three-eighths of a mile, lies West Island, a mile and a half long in a N. by W. and S. by E. direction, and three-quarters of a mile wide. When seen from the south-westward it will appear low and thickly wooded except near the water-line, where the shores are flat and grassy. Like Sconticut Neck, it is surrounded by shoal water and has many outlying ledges, which render an approach to it unsafe without a pilot; and although anchorage may be found in from two to three fathoms in the cove formed between the island and Sconticut Neck, yet the entrance is so obstructed by ledges that strangers should never attempt it.

West Island.

On the eastern side of West Island is another large indentation in the northwestern shore, known as Nasketucket Bay, which is contained between Mattapoiset Neck on the east and Sconticut Neck on the west, and affords good anchorage in from two to three fathoms, soft bottom. This bay is two miles wide at its mouth, but gradually contracts in width until, at its head,—a mile and five-eighths above,—it is but little over half a mile across. Here empties the Nasketucket River,—a small but shallow stream of no importance. Seen from the southward, the shores of this bay appear low and thickly wooded, which is in fact the case with the northern shores formed by Mattapoiset Neck; but at the head of the harbor the land is composed of cleared and cultivated fields, interspersed with groves of trees. Several small islets are seen in the bay,—one of which, lying near the southern shore of Mattapoiset Neck, is very remarkable, strongly resembling a haycock.

Nasketucket Bay.

Mattapoiset Neck has much the same appearance, when seen from the southward, as West Island,—being low and thickly wooded, except near the shore-line, where the surface is flat and grassy. Long ledges and outlying rocks on its southeastern side make it unsafe to approach the point nearer than a mile and a half. This neck forms also the western shore of Mattapoiset Harbor, another large indentation in the northern shore of the bay, running NW. and SE., and about two miles long. Its eastern point of entrance is called Angelica Point,—a low, flat, grassy point, backed by trees and faced by a line of large boulders, which, extending from the point to the southward, look somewhat like a breakwater. A solitary house is seen on the point; but behind this and to the northward only dense woods appear.

Mattapoiset Harbor.

On the northern side of the harbor, a mile and a half to the northwestward of Angelica Point, will be seen a low white tower, with two white houses close to it, standing on a flat plateau with perpendicular sandy faces. This is Ned's Point Light-house, on Ned's Point, (three-quarters of a mile below the village,) and shows a fixed white light, of the sixth order, from a height of forty-three feet above the sea, visible eleven miles. Its geographical position is

Ned's Point Light-house.

Latitude ----- 41° 39' 1" N.
Longitude ----- 70° 47' 45" W.,

and it bears from

Miles.

The spindle on Cormorant Rock, N. $\frac{1}{2}$ E. ----- 2 $\frac{1}{2}$
The entrance to Wood's Hole, N. by W. $\frac{1}{4}$ W. ----- 8 $\frac{1}{2}$
Angelica Point, NW. $\frac{1}{2}$ W. ----- 1 $\frac{1}{2}$

(See detailed description of Mattapoiset Harbor.)

From Angelica Point to Pease's Point, three-quarters of a mile above, the general course of the northwestern shore of the bay is NE. $\frac{1}{4}$ N.; but it is much cut up by small coves. Pease's Point is low, flat, grassy, and backed by trees. Hence to the northward the shore has a general course N. $\frac{1}{2}$ E. for seven-eighths of a mile to the entrance to Aucoot Cove, a semicircular indentation about five-eighths of a mile long in a NW. by N. direction and about half a mile wide, affording fair anchorage in from nine to sixteen feet at low water. Its eastern shore is formed by Charles' Neck, which when viewed from the southward, shows as a flat, low, grassy point, with steep faces, along whose base boulders are thickly strewn,—the whole being backed by thick woods.

Aucoot Cove.

This neck separates the cove from Sippican Harbor, a long and narrow arm of the bay making into the northwestern shores to a NNW. direction for two miles and three-quarters. At its mouth it is a mile and an eighth wide, but gradually diminishes in width to its head, where it is but little over half a mile from shore to shore. The whole of the western side of Charles' Neck is thickly strewn with boulders, great numbers lying outside of

Sippican Harbor.

the low-water line, and extending from the southern extremity of the neck to **Seward's Island**, a mile above. The general name **Seal Rocks** has been applied to them.

The eastern shore of Sippican Harbor is formed by **Sippican Neck**, and is for the most part cleared, but backed by thick woods,—the whole of the northern and eastern part of the neck being densely wooded. **Sippican Point**, its southern extremity, is low, flat, and grassy, faced by boulders, and bare of trees except for a clump of low bushes and scrubby trees a little to the northward of its extremity. The thick woods begin about half a mile to the northward of the point, and just on their edge is a clearing with a group of houses.

Nearly nine hundred yards **S. by W.** from the southern end of Sippican Neck is **Bird Island**, round, low, and perfectly flat, entirely bare of trees and faced by a stone sea-wall. A white light-tower will be seen in the centre of the island, rising from a group of houses of the same color. This is **Bird Island Light-house**, and shows a fixed light of the fifth order, varied by white flashes at intervals of a minute and a half, from a height of thirty-seven feet above the sea, visible eleven miles. Its geographical position is

Latitude **41° 40' 8" N.**
Longitude **70° 43' 3" W.,**

and it bears from

The spindle on Cormorant Rock, NE. $\frac{1}{2}$ E.	Miles.
The entrance to Wood's Hole, N. $\frac{1}{2}$ E.	5
Wing's Neck Light-house, W. $\frac{1}{2}$ S.	8 $\frac{1}{2}$
	2 $\frac{1}{2}$

The light-house is, in reality, near the southern end of the island; and near the northern end will be seen a red boat-house. There is no safe passage to the northward of Bird Island,—the space between it and the neck being occupied by dangerous sunken ledges.

On passing Bird Island, bound up Buzzard's Bay, the western shore trends to the northward,—the trend of the eastern side of Sippican Neck being about **N. $\frac{3}{4}$ E.** for three-quarters of a mile; and then turning abruptly, about **NW.** by **N. $\frac{1}{2}$ N.** for a mile and an eighth,—forming the southern shore of Wing's Cove. It is mostly cleared from the southern extremity of the neck to the mouth of the cove, but beyond that is thickly wooded. On the northern side of the cove will be seen a long, densely wooded hill, with a large square white building, with cupola on top, near its base, on the northeastern side. The hill is known as **Great Hill**, and the house as the **Marion House**,—a summer resort of some importance. It is nearly opposite to Tempe's Nob. Wing's Cove is shallow, but has good anchorage for small vessels in from five to seven feet at low water and is unobstructed. Its northeastern point of entrance lies at the foot of Great Hill, is low, white and sandy, and supports a handsome grove of tall trees. (See View.)

On the northern side of Great Hill, **Weweantic River** makes in to the northwestward, a narrow and shallow stream of little importance, and easily entered, with seven feet water, by keeping the northern shore of Great Hill aboard until past the long reef making to the southward from Long Beach Point, and after that keeping midway between the two shores. On its northern side it is separated from Wareham River by **Cromeset Neck**, low, flat and rocky, covered with a thick growth of scrubby trees except at its southern extremity, which is cleared and grassy. All of this shore is quite shoal, and strangers must not attempt to pass above Bird Island Light-house without a pilot.

Wareham River. Wareham River empties into the northwestern corner of Buzzard's Bay, between Warren's Point on the east and Nobska Point (the northeastern point of Cromeset Neck) on the west. It runs through a narrow and crooked channel for nearly three miles to the village of **Wareham**, on its western bank; and for upwards of one-third of that distance the channel, at low water, is a mere creek. It is, however, being improved by the United States Engineers,—the intention being to obtain a depth of six feet at mean low water up to the wharves. The numerous ledges and flats which obstruct the channel are well buoyed, but owing to its contracted limits, winding course, and velocity of current it is unsafe for strangers, however light their draught, to enter it.

Warren's Point, the eastern point of entrance to the river, is low, flat and sandy, bare of trees near its western end, but carrying a thick grove about a quarter of a mile back from the river. From it, at low water, a sand-spit extends to a sandy islet destitute of all vegetation, and only a few feet above high-water mark; and about fifty yards to the westward of this there is another, which, when viewed from the mouth of the river appears as a low sandy point covered with a dense growth of scrub. This is called **Long Beach Point**, and the spit connecting it with the mainland is called **Long Beach**.

Nobska Point, on the western side of the entrance to the river, is also a flat point with sandy faces, carrying a scattered growth of trees on its surface and a number of large boulders on its eastern end. On its northern side makes in **Mark's Cove** a shallow indentation of no importance, and which has been partially filled up by the sand dug from the channel of the river (See detailed description of Wareham River and its dangers.)

DANGERS

IN APPROACHING AND ENTERING BUZZARD'S BAY.

As before mentioned, (see page 185,) there are no dangers whatever in the channel-way of this bay,—a good beating channel, not less than three and a half miles wide, existing as far up as abreast

of Sippican Harbor. The shores on both sides, however, are foul in many places; and this is notably the case at the entrance, where dangerous ledges make off from Gooseberry Neck to the southward for a mile and three-eighths. These are called The Hen and Chickens; are in some places dry at half-tide and in others have from three to six feet upon them. The southernmost group consists of three rocks, one of which is three feet out at low water, and is called *The Old Cock*; while the others have from three to four feet upon them, and are called *The Young Cocks*. On The Old Cock, which is also the outermost of the group, is placed an iron spindle thirty-six feet high, and surmounted by a cage of open-work,—the whole being painted black; and just to the southeastward of it, in three and a half fathoms, a black spar-buoy (No. 1) will be seen. The spindle bears from

The Hen and Chickens.

	Miles.
East Rock, (the outermost of the islets off Sakonnet Point,) E. $\frac{1}{2}$ S. -----	7 $\frac{3}{8}$
Gooseberry Neck, S. $\frac{3}{4}$ E.-----	1 $\frac{1}{4}$
Hen and Chickens Light-vessel, N. by W. $\frac{1}{2}$ W.-----	1

From it Dumpling Rock Light-house will bear NE. by E., six and a half miles distant, seen just over the southern end of Mishaum Point. The buoy is about two hundred yards SSE. from the spindle.

Nearly one mile S. by E. $\frac{1}{2}$ E. from the black buoy (No. 1) is anchored Hen and Chickens Light-vessel, a schooner-rigged vessel with a black day-mark at the main-mast head, and showing only one light. The hull is painted lead-color,—the name, "*Hen and Chickens*," on each side. The vessel is anchored in ten fathoms water exactly in mid-channel and on the following bearings: From

Hen and Chickens Light-vessel.

	Miles.
Brenton's Reef Light-vessel, E. $\frac{1}{2}$ S.-----	16
Point Judith Light-house, E. $\frac{3}{8}$ N.-----	21 $\frac{1}{2}$
Block Island North Light-house, E. by N. $\frac{1}{2}$ N. ----- nearly	28
Block Island Southeast Light-house, NE. by E. $\frac{3}{4}$ E.-----	29 $\frac{1}{8}$
Vineyard Sound Light-vessel, N. $\frac{1}{8}$ W.-----	3 $\frac{3}{4}$
Cuttyhunk Light-house, NW. $\frac{1}{4}$ W.-----	3 $\frac{1}{2}$

From this light-vessel

	Miles.
Dumpling Rock Light-house bears NE. $\frac{1}{4}$ E.-----	6 $\frac{7}{8}$
The buoy on Wilkes' Ledge NE. by E. $\frac{1}{2}$ E.-----	6 $\frac{1}{8}$
Wing's Neck Light-house NE. by E. $\frac{1}{4}$ E.----- nearly	21
Entrance to Wood's Hole E. $\frac{3}{4}$ N.----- a little over	15

Nearly a mile SW. by S. from Hen and Chickens Light-vessel, in about eight fathoms water, is placed a "Whistling Buoy," which is sounded by the motion of the sea. This buoy is painted black, and bears from Cuttyhunk Light-house NW. by W. $\frac{3}{4}$ W., distant three miles and a half, and from Dumpling Rock Light-house SW. Westerly, distant a little over eight miles.

Falling into the southward of the light-vessel, it is necessary to look out for Sow and Pigs Reef, which makes off from the western end of Cuttyhunk Island in a nearly WSW. direction for a mile and three-eighths and is bare in several places at mean low water. There are also a number of boulders, which are always out, scattered along its length. On its western end, a mile and a half WSW. from Cuttyhunk Light-house, is placed a can-buoy of the first class, painted red and marked No. 2, with the words "*Sow and Pigs*" on its head. It bears from Vineyard Sound Light-vessel NE. $\frac{3}{8}$ N., nearly one mile, and from Hen and Chickens Light-vessel SE. by S. $\frac{1}{2}$ S., nearly three miles and a quarter distant.

Sow and Pigs Reef.

When to the eastward of The Hen and Chickens, in beating up the bay, vessels must not stand farther to the southward than to bring the northern end of Penikese Island to bear E. by N. $\frac{1}{4}$ N. until to the eastward of Cuttyhunk Light-house bearing SE. $\frac{1}{2}$ S. This avoids Ribbon Reef, a small detached ledge, with fifteen feet at mean low water, which lies two miles SE. $\frac{3}{4}$ E. from Hen and Chickens Light-vessel and nearly a mile and a half NW. $\frac{1}{4}$ W. from Cuttyhunk Light-house. It is marked by a nun-buoy* of the second class, painted red and black in horizontal stripes, and placed in four fathoms off its northwestern end. There is good water for the largest vessels on all sides of the reef by giving the buoy a berth of a quarter of a mile. Ribbon Reef buoy bears from

Ribbon Reef.

	Miles.
Hen and Chickens Light-vessel, SE. $\frac{3}{4}$ E.-----	2
Cuttyhunk Light-house, NW. $\frac{1}{8}$ W.-----	1 $\frac{1}{2}$
The northern end of Penikese Island, W. by S. $\frac{3}{4}$ S.-----	2 $\frac{3}{4}$
Dumpling Rock Light-house, SW. by S. $\frac{1}{4}$ S.-----	6 $\frac{1}{4}$

In standing to the northward on a wind, when off the entrance to Slocum's River, vessels should not go to the northward of Hen and Chickens Light-vessel bearing SW. by W., or Dumpling Rock Light-house NE. $\frac{1}{2}$ N., to avoid Mishaum Ledge, a detached rock, with eight feet at **Mishaum Ledge.** mean low water, lying nearly a mile and a half SW. $\frac{1}{3}$ S. from Mishaum Point, and marked by a black nun-buoy* (No. 3) of the second class, placed in three fathoms off its southeastern side. There are also several shoal spots, with from thirteen to eighteen feet water, from three-eighths to half a mile to the westward of the buoy, so that in passing inshore of it, it should be given a berth of not less than three-quarters of a mile.

The buoy on Mishaum Ledge bears from

	Miles.
The spindle on The Old Cock, E. by N. $\frac{7}{8}$ N.-----	3 $\frac{3}{8}$
Hen and Chickens Light-vessel, NE. $\frac{5}{8}$ E.-----	3 $\frac{3}{8}$
Northern end of Penikese Island, NW. by N. $\frac{1}{2}$ N.-----	2 $\frac{3}{4}$
Mishaum Point, SW. by S. $\frac{5}{8}$ S.-----	1 $\frac{1}{2}$

From this buoy Dumpling Rock Light-house bears NE. $\frac{1}{4}$ N., three miles and five-eighths, and the buoy on Wilkes' Ledge E. by N. $\frac{1}{2}$ N., two miles and five-eighths distant. There is a good channel from a half to three-quarters of a mile wide, with from three to eight fathoms in it, between this buoy and Mishaum Point; but strangers are not advised to attempt it.

When to the eastward of Mishaum Ledge, Mishaum Point should not be approached from the southward nearer than three-eighths of a mile, as shoal water makes off from it four hundred and fifty yards in that direction. Likewise, when standing to the northward, between this point and Dumpling Rocks, vessels should not pass to the westward of Dumpling Rock Light-house bearing NE. $\frac{1}{2}$ N., to avoid shoal water on the eastern side of the point. This bearing also avoids a dangerous sunken ledge, which is out at extreme low tide, and is called Salter's Point Ledge. It is marked by a black spar-buoy (No. 5), placed in fifteen feet water on its eastern side and close to it,—bearing from

	Miles.
Mishaum Point, NE. by E. $\frac{1}{4}$ E.-----	1
Dumpling Rock Light-house, SW. $\frac{1}{2}$ W.-----	1
Wilkes' Ledge buoy, NW. $\frac{1}{8}$ N.-----	1 $\frac{1}{2}$
Mishaum Ledge buoy, NE. $\frac{1}{2}$ N.-----	2 $\frac{1}{2}$
Hen and Chickens Light-vessel, NE. $\frac{1}{4}$ E.-----	nearly 6

In standing to the southward, in the vicinity of Penikese Island, vessels of large draught should not approach the northern side of the island nearer than three-quarters of a mile, as there is a shoal with from three to four fathoms upon it, about nine hundred yards N. by E. from its northern point but when to the eastward of the island the northern shore of Nashawena may be approached quite closely with not less than six fathoms.

In standing up the bay, when past Mishaum Ledge look out, on the northern side of the channel for the can-buoy* on Wilkes' Ledge, which will soon appear to the northward of the course, bearing about NE. $\frac{1}{4}$ N., about two miles distant. This ledge is a detached shoal with nine feet at mean low water, and a deep channel on all sides of it, suitable for vessels of the largest size. It lies nearly E. and W., covering a space of about four hundred yards between the lines of three fathoms, and is marked by a can-buoy* of the first class, painted red and black in horizontal stripes, placed in sixteen feet on the southern edge of the shoal. This buoy bears from Hen and Chickens Light-vessel NE. by E. $\frac{1}{2}$ E., six miles and an eighth distant. From it

	Miles.
Dumpling Rock Light-house bears N. $\frac{1}{2}$ W.-----	1 $\frac{3}{4}$
The red buoy on the western side of Great Ledge NE. by N. $\frac{1}{2}$ N.-----	1 $\frac{1}{2}$
Clark's Point Light-house N. by E. $\frac{3}{4}$ E.-----	4 $\frac{1}{2}$
The black buoy on the eastern side of Great Ledge NE. by N.-----	1 $\frac{1}{2}$

A mile and a quarter due N. from the buoy on Wilkes' Ledge, and half a mile S. by E. $\frac{1}{4}$ E. from Dumpling Rock Light-house, will be seen a red can-buoy.* This is on **The Sand Spit.** Spit, a shoal with eleven feet water, about a quarter of a mile long in an E. and W. direction, lying on the southeastern side of the Western Channel into New Bedford. It is not in the way of vessels passing up the bay, as they should not stand to the northward of the buoy on Wilkes' Ledge bearing SW. by W. $\frac{1}{2}$ W., by which means they will avoid all the dangers to the eastward of that buoy until up with West Island.

A mile and three-quarters to the northeastward of Wilkes' Ledge buoy (lying between the bearing of NE. by N. and NE. by N. $\frac{1}{2}$ N.) is Great Ledge, in the middle of the entrance to the Middle Channel of New Bedford. It is a detached shoal, about four hundred and fifty yards in diameter, awash upon its shoalest part, and is marked by two spar-buoys,—a red buoy (No. 6) on its western side and a black buoy (No. 7) on its eastern side. The former bears NE. by N. $\frac{1}{4}$ N., and the latter NE. by N. from Wilkes' Ledge buoy; while from Dumpling

Rock Light-house both are in line on a bearing of E. $\frac{1}{2}$ S.,—the red buoy being a mile, and the black one a mile and a quarter distant. From the red buoy Clark's Point Light-house bears N. $\frac{1}{2}$ E., three miles and an eighth, and from the black buoy it bears N. $\frac{3}{4}$ E., the same distance.

Vessels standing to the southward, in the vicinity of the entrance to Quick's Hole, must look out for Lone Rock, a small detached ledge, with three feet at low water, lying three-quarters of a mile N. by E. $\frac{1}{4}$ E. from the northeastern point of Nashawena Island. There are soundings of from five to nine fathoms on all sides of the rock, which is marked by a nun-buoy of the third class, painted red and black in horizontal stripes, and placed on its southern side in five fathoms water. This buoy bears from Dumpling Rock Light-house S. by E. $\frac{1}{4}$ E., five miles and a half, and from Clark's Point Light-house S. $\frac{1}{2}$ E. Nearly, about eight miles distant. To avoid the rock vessels should not stand to the southward of Hen and Chickens Light-vessel bearing W. $\frac{1}{2}$ N.; or, in other words, should keep it open to the northward of Penikese Island.

Lone Rock.

To the eastward of Lone Rock there are no dangers, on the southern side of the bay, until Wapecket Island is reached, six miles to the eastward. But, on the northern side, when about two miles and a half to the eastward of Wilkes' Ledge it is necessary to look out for Hursell Rock, a detached ledge, with fourteen and a half feet, lying off the middle of the entrance to the East Channel of New Bedford, and marked by a spar-buoy painted red and black in horizontal stripes. It bears from

Hursell Rock.

	Miles.
The buoy on Wilkes' Ledge, NE. $\frac{3}{4}$ E.-----	3
Dumpling Rock Light-house, E. $\frac{1}{4}$ N.-----	2 $\frac{1}{2}$
Clark's Point Light-house, S SE.-----	a little over 3

Vessels may avoid it in the day-time by not standing to the northward of Wilkes' Ledge buoy bearing W. by W. $\frac{1}{2}$ W., and at night-time by going about as soon as Dumpling Rock Light-house bears W. $\frac{3}{4}$ N.

Nearly a mile to the northeastward of Hursell Rock will be seen a red spar-buoy off the southern end of Scouticut Neck. This buoy is on the southwestern side of Mosher Ledge,—the southernmost of the shoals off Scouticut, and on the eastern side of the entrance to the Eastern Channel of New Bedford. It is about seven hundred yards in diameter, has six feet at mean low water, and the shoal of the ledge bears from Clark's Point Light-house SE. $\frac{3}{4}$ S., two miles and five-eighths distant. The buoy is marked No. 4, placed in eighteen feet about three hundred yards to the southwestward of the six-foot spot, and bears from Dumpling Rock Light-house E. by N. $\frac{1}{2}$ N., about three miles and a quarter, and from Wilkes' Ledge buoy NE. $\frac{1}{8}$ E., three miles and seven-eighths distant. To avoid it, when in its vicinity, vessels beating through the bay would not stand to the northward of Dumpling Rock Light-house bearing W. by S.; and if bound to New Bedford, should not go to the eastward of Clark's Point Light-house bearing NW. by N.

Mosher Ledge.

About five-eighths of a mile to the eastward of the buoy on Mosher Ledge lies the red can-buoy* on West Island Ledge,—the southwestern extremity of the dangerous shoals making off from that island. This ledge lies nearly E NE. and W SW., is half a mile long, with no greater depth than eleven feet, and is awash at low water at its northeastern end. The buoy is in fifteen feet about seven hundred yards to the southwestward of the shallowest part, is marked No. 2, and bears from

West Island Ledge.

	Miles.
Clark's Point Light-house, SE. $\frac{1}{4}$ E.-----	3
Dumpling Rock Light-house, E. by N. $\frac{3}{8}$ N.-----	3 $\frac{1}{4}$
The buoy on Wilkes' Ledge, NE. $\frac{1}{2}$ E.-----	4 $\frac{1}{2}$

To avoid it, vessels should not stand to the northward of Dumpling Rock Light-house bearing W. by S. On approaching West Island from the southward, a large black can-buoy* will be seen about a mile off its southern end. This is on West Island Point,—the southeastern extremity of the shoals making off from that island. Four feet at mean low water is found three-eighths of a mile S. by E. from the island, and eleven feet five-eighths of a mile in the same direction. Soundings varying from four to seventeen feet are found along the length of this shoal; but it is extremely dangerous to pass between the buoy and the point. The buoy is painted black, marked No. 9, placed in three and a half fathoms on the southern point of the shoal, and bears from

West Island Point.

	Miles.
Wilkes' Ledge buoy, NE. by E. $\frac{1}{2}$ E.-----	5 $\frac{3}{8}$
Dumpling Rock Light-house, E. $\frac{1}{4}$ N.-----	5 $\frac{1}{8}$
Clark's Point Light-house, SE. by E. $\frac{1}{4}$ E.-----	4 $\frac{1}{4}$
Entrance to Quick's Hole, N NE.-----	6 $\frac{1}{4}$
Entrance to Wood's Hole, NW. by W.-----	6 $\frac{3}{8}$

From this buoy Bird Island Light-house bears NE., seven miles and three-eighths, and Wing's Neck Light-house NE. by E., nine miles and a half distant. The buoy on Nye's Ledge bears NE., three miles and a half distant.

To avoid West Island Point, when in its vicinity, vessels should not stand to the northward of Dumpling Rock Light-house bearing **W. $\frac{1}{2}$ S.**, or Bird Island Light-house bearing **NE. $\frac{1}{8}$ N.**

On the southern side of the bay, **Wœpecket Island** (a small islet lying close in with the southern shore of the bay, about two miles and a quarter below the entrance to Wood's Hole) should not be approached nearer than three-quarters of a mile, as *dangerous ledges, awash in places at low water,*

Wœpecket Rock.

make off from its northern end in a **NE. by N.** direction for about five-eighths of a mile. To avoid these, if Wing's Neck Light-house can be seen, vessels should go about as soon as it bears **NE. by N.**; and by this precaution they will also avoid **Wœpecket Rock**, a small detached ledge, awash at low spring-tides, lying one mile and a quarter **NE. $\frac{1}{4}$ E.** from the island and a mile and an eighth **NW. $\frac{5}{8}$ W.** from the eastern end of Uncatena Island. On its southern side, in eleven feet at low water, is placed a spar-buoy painted red and black in horizontal stripes, and bearing from the middle of Wœpecket Island **NE. $\frac{1}{2}$ E.**, nearly a mile and a quarter, and from the northeastern end of Uncatena Island **NW. by W. Westerly**, nearly a mile and an eighth distant.

Beyond Wœpecket Rock there are no dangers on the southeastern side of the bay until up with Gunning Point, three miles and a half above. On the northern side, however, after passing to the eastward of West Island Point, it is necessary to look out for the dangerous ledges

Cormorant Rock.

making off from Mattapoiset Neck. Of these, the southernmost and first met with lies a mile and three-eighths **S. by E. $\frac{1}{2}$ E.** from the neck, and is marked by an iron spindle, twenty-six feet high, painted black and surmounted by a cage. This is **Cormorant Rock**, dry at low water. It bears from the black can-buoy on West Island Point **NE. by N.**, two miles and three-eighths. From the spindle

	Miles.
Ned's Point Light-house bears N. $\frac{1}{2}$ E. -----nearly	2 $\frac{3}{4}$
The spar-buoy on Nye's Ledge NE. by E. $\frac{1}{2}$ E. -----	1 $\frac{1}{4}$
Bird Island Light-house NE. $\frac{1}{2}$ E. -----	5
Wing's Neck Light-house NE. by E. $\frac{1}{2}$ E. -----	7 $\frac{3}{8}$
Entrance to Cataumet Harbor E. by N. $\frac{1}{4}$ N. -----	6 $\frac{3}{4}$
Entrance to Hog Island Harbor E. $\frac{3}{8}$ S. -----	6 $\frac{1}{4}$

When past the spindle on Cormorant Rock, and approaching the entrance to Mattapoiset Harbor, a spar-buoy, painted red and black in horizontal stripes, will be seen. This is on Nye's Ledge,—the easternmost of the ledges off Mattapoiset Neck, and on the southern side of the entrance to Mattapoiset Harbor. It is nearly half a mile long **NW. by N.** and **SE. by S.**, and has seven feet at mean low water on its shoalest part, which bears **SE. $\frac{3}{4}$ E.** from the middle of the neck, a mile and a half distant. There is a channel a quarter of a mile wide, with from three to four fathoms in it, between this ledge and Mattapoiset Ledge to the westward; but strangers should not attempt it. The buoy is placed in fifteen feet on the southern end of the ledge, and bears from

Nye's Ledge.

	Miles.
The black can-buoy on West Island Point, NE. $\frac{1}{8}$ N. -----	3 $\frac{1}{2}$
Cormorant Rock spindle, NE. by E. $\frac{1}{2}$ E. -----	1 $\frac{1}{4}$
Entrance to Wood's Hole, N. by W. $\frac{3}{4}$ W. -----	6 $\frac{1}{4}$

From the buoy

	Miles.
Angelica Point bears N. by E. $\frac{5}{8}$ E. -----	1 $\frac{3}{8}$
Ned's Point Light-house N. by W. $\frac{3}{4}$ W. -----	2 $\frac{1}{4}$
Bird Island Light-house NE. $\frac{1}{2}$ E. -----	3 $\frac{3}{4}$
Wing's Neck Light House NE. by E. $\frac{1}{2}$ E. -----a little over	6
Entrance to Cataumet Harbor E. by N. -----	5 $\frac{3}{4}$
Entrance to Hog Island Harbor E. by S. $\frac{1}{2}$ S. -----	5 $\frac{1}{4}$

To avoid Nye's Ledge, vessels should not stand to the westward of Bird Island Light-house bearing **NE. $\frac{1}{8}$ N.**

On the eastern side of the bay, when to the northward of Quisset, and nearing Gunning Point, a red spar-buoy will be seen to the northwestward of that point. This is on Hamlin Point Rocks, a long reef making off to the northwestward from Hamlin and Gunning points for three-quarters of a mile with from twelve to thirteen feet water upon it. The buoy is marked No. 4, placed in thirteen feet on the northwestern edge of the shoal, and bears from the entrance to Wood's Hole **NE. by N. $\frac{1}{2}$ N.**, three miles, and from Gunning Point **NW. $\frac{1}{2}$ N.**, three-quarters of a mile distant. From it

Hamlin Point Rocks.

	Miles.
Bird Island Light-house bears N. by W. -----nearly	6
Wing's Neck Light-house N. by E. $\frac{1}{4}$ E. -----nearly	6 $\frac{1}{4}$
The red buoy on Gifford's Ledge N. by E. $\frac{1}{4}$ E. -----	1 $\frac{1}{8}$

To avoid this, as well as Gifford's Ledge, vessels should not stand to the eastward of Wing's Neck Light-house bearing **N. by E. $\frac{1}{2}$ E.**

A mile and an eighth to the northward of Hamlin Point buoy will be seen another red spar-buoy (No. 6). This is on the northwestern end of Gifford's Ledge, (a rocky shoal similar to Hamlin Point Rocks,) making off from the eastern shore about five-eighths of a *Gifford's Ledge*. mile below Hog Island Point, and in some some places bare at low water a quarter of a mile from shore. There is ten feet water close to the buoy, which is placed in fifteen feet three-quarters of a mile from the eastern shore,—and bears from Hog Island Point **SW. $\frac{3}{4}$ W.**, seven-eighths of a mile, and from the red buoy on Hamlin Point Rocks **N. by E. $\frac{1}{4}$ E.**, a mile and an eighth distant. From this buoy Bird Island Light-house bears **N. by W. $\frac{1}{2}$ W.**, five miles, and Wing's Neck Light-house **N. by E. $\frac{1}{2}$ E.**, the same distance.

From Gifford's Ledge to about a mile to the northward of Hog Island Point the eastern shore should not be approached by vessels of large draught nearer than five-eighths of a mile. But in the vicinity of Wild Harbor the shore is comparatively clean, and Nye's Neck may be approached within a quarter of a mile with five fathoms at low water.

On the western side of the bay, when past Mattapoiset and approaching Sippican Harbor, a black spar-buoy (No. 11) will be seen about three-quarters of a mile to the eastward of Pease's Point. This is on *The Bow Bells*, a detached ledge, with ten and a half feet at mean low water and from three to four fathoms on all sides of it, which lies nearly a mile and a quarter **S. $\frac{1}{2}$ E.** from Charles' Neck. The buoy is in fifteen feet on its southeastern end and bears from

	Miles.
Nye's Ledge buoy, NE. $\frac{1}{8}$ N. -----	2 $\frac{3}{8}$
Angelica Point, E. by N. $\frac{5}{8}$ N. -----	1 $\frac{1}{4}$
Pease's Point, E. by S. $\frac{3}{8}$ S. -----	3 $\frac{3}{4}$
Bird Island Light-house, SW. $\frac{3}{4}$ W. -----	nearly 1 $\frac{1}{2}$

From this buoy

	Miles.
Wing's Neck Light-house bears E. by N. $\frac{1}{2}$ N. -----	3 $\frac{7}{8}$
Entrance to Pocasset Harbor E. $\frac{3}{8}$ N. -----	3 $\frac{3}{8}$
Entrance to Cataumet Harbor E. $\frac{3}{4}$ S. -----	3 $\frac{3}{4}$
Nye's Neck, at the entrance to Wild Harbor, E SE. -----	nearly 4

To avoid *The Bow Bells*, vessels should not stand to the westward of Bird Island Light-house bearing **NE.**

When up with Bird Island Light-house, a black spar-buoy will be seen about three-eighths of a mile to the eastward of it. This is on Bird Island Reef, which has from four to six feet at low water, and forms part of the shoal ground making off from Sippican Neck in a **SSE.** direction for half a mile. The buoy is marked No. 13, placed in three fathoms on the eastern edge of the shoal, and bears from Bird Island Light-house **E. $\frac{1}{4}$ S.**, three-eighths of a mile, and from Wing's Neck Light-house **W. $\frac{1}{2}$ S.**, nearly two miles and a quarter distant. To avoid this shoal, vessels should give the light-house a berth to the westward of not less than three-quarters of a mile.

Bird Island Reef.

On the eastern side of the bay, and on the northern side of the entrance to Cataumet Harbor, will be seen two red spar-buoys in a line nearly **N. by E.** and **S. by W.** from each other, and about five-eighths of a mile apart. These are on Southwest Ledge, a dangerous shoal, lying to the westward of Scraggy Neck and between Pocasset and Cataumet harbors. It is awash in places at low water, lies **N. by E.** and **S. by W.**, is seven-eighths of a mile long, and there is no passage inshore of it. A red spar-buoy (No. 8) is placed on the western side of its southern end in fifteen feet at low water, and another, marked No. 10, on the western side of its northern end in sixteen feet. The former bears from

Southwest Ledge.

	Miles.
Nye's Neck, NNW. -----	1 $\frac{1}{4}$
The southern end of Scraggy Neck, W. -----	1 $\frac{1}{4}$
Bird Island Light-house, SE. by E. $\frac{1}{4}$ E. -----	2 $\frac{1}{4}$

From this buoy

	Miles.
The buoy on the northern end bears N. $\frac{3}{4}$ E. -----	1 $\frac{3}{8}$
Wing's Neck Light-house NE. by N. $\frac{1}{8}$ N. -----	1 $\frac{1}{2}$
The buoy on Abiel's Ledge (at the entrance to Cohasset Narrows) N. $\frac{1}{2}$ E. -----	nearly 2

The buoy on the northern end of Southwest Ledge bears from

	Miles.
Bird Island Light-house, E. by S. $\frac{1}{4}$ S. -----	2 $\frac{1}{8}$
The buoy on Abiel's Ledge, S. $\frac{3}{8}$ W. ----- a little over	1 $\frac{1}{4}$
Wing's Neck Light-house, SW. by S. -----	$\frac{7}{8}$
The northern end of Scraggy Neck, W. $\frac{1}{4}$ S. -----	$\frac{7}{8}$

To avoid Southwest Ledge, vessels when in its vicinity should not stand to the eastward of Wing's Neck Light-house bearing NE. $\frac{1}{4}$ N.

When nearly up with Wing's Neck Light-house a black spar-buoy will be seen about three-quarters of a mile to the northwestward of it. This is on Abiel's Ledge, a dangerous shoal, with seven feet at mean low water, which lies on the northern side of the channel leading into Cohasset Narrows and Back River. The buoy is marked No. 1, (as the entrance buoy to the Narrows,) and is placed in sixteen feet at low water on the southern side of the ledge. From it

	Miles.
Tempe's Nob bears NNE. -----	1 $\frac{3}{4}$
The summit of Great Hill NW. $\frac{5}{8}$ W. -----	2 $\frac{1}{2}$
The black buoy on Wing's Neck Flats E. by N. $\frac{3}{8}$ N. -----	1 $\frac{3}{8}$
Wing's Neck Light-house SE. by S. -----	$\frac{3}{4}$

To the northward of Abiel's Ledge the bay is full of dangerous ledges and shoals and its navigation should not be attempted without a pilot. Vessels bound to Wareham will, after passing this ledge, first fall in with a red spar-buoy about a mile to the eastward of Great Hill. This is on the southern end of Dry Ledge, a dangerous reef which makes to the southward from Little

Dry Ledge. Bird Island for seven-eighths of a mile and is dry in several places at low water. The buoy is marked No. 12, placed in sixteen feet at mean low water on the southern end of the ledge, and bears from Wing's Neck Light-house NW. $\frac{1}{2}$ N., one mile and three-quarters, and from Bird Island Light-house NE. $\frac{1}{2}$ N., two miles and an eighth distant. It marks the eastern limits of the channel leading into Wareham River, and strangers should not attempt to pass beyond it without a pilot.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING BUZZARD'S BAY.

I. From the Westward.—The course from one mile to the southward of Point Judith, for Hen and Chickens Light-vessel, is E. $\frac{1}{2}$ N., and the distance twenty-one and three-eighths miles; from three miles to the northward of Block Island Light-house it is E. by N., twenty-seven miles and a quarter; and from three miles due S. of Block Island Southeast Light-house it is NE. $\frac{1}{8}$ E., the distance being thirty-two miles. When up with the light-vessel the course should be continued to the eastward for seven-eighths of a mile, carrying not less than ten fathoms, until Cuttyhunk Light-house bears SE. $\frac{1}{2}$ S., two miles and seven-eighths, and Vineyard Sound Light-vessel S. $\frac{1}{4}$ W., three miles and five-eighths distant, when the depth will be about ten fathoms, "yellow sand and shells," and the course NE. by E. $\frac{3}{4}$ E. eleven miles and three-quarters, carrying not less than seven fathoms. On this course, when Bird Island Light-house bears NE. $\frac{3}{4}$ N. and Wing's Neck Light-house NE. $\frac{3}{8}$ E., a NE. course will lead safely up the bay, in mid-channel, carrying not less than three and three-quarter fathoms, as far as the buoy on Abiel's Ledge.

The above courses pass from a mile to a mile and a half to the southward of the black buoy on the southern end of The Hen and Chickens; two miles and three-quarters to the northward of Sow and Pigs Reef; a mile and three-eighths to the northward of Ribbon Reef; a mile and an eighth to the southward of the black buoy on Mishaum Ledge; a little over a mile and a half to the northward of Penikese Island; three-quarters of a mile to the southward of Wilkes' Ledge; a mile and five-eighths to the southward of Great Ledge; a mile and three-eighths to the southward of Hursell Rock; a mile and a half to the southward of West Island Ledge; seven-eighths of a mile to the southward of the black buoy on West Island Point; a mile and a half to the eastward of the spindle on Cormorant Rock; a mile and an eighth to the eastward of the striped buoy on Nye's Ledge; the same distance to the eastward of the black buoy on The Bow Bells; seven-eighths of a mile to the eastward of Bird Island Light-house; a mile and three-eighths to the westward of the red-buoy on the southern end of Southwest Ledge; a little over half a mile to the eastward of the black buoy on Bird Island Reef; a mile to the westward of the red buoy on the northern end of Southwest Ledge; and three-quarters of a mile to the westward of Wing's Neck Light-house.

On the above courses, to enter Cuttyhunk Harbor.—On the $E. \frac{1}{2} N.$ course from *Sailing Directions--Buzzard's Bay.* off Point Judith, when abreast of Hen and Chickens Light-vessel, in ten fathoms, having it bearing $N. \frac{1}{2} W.$ an eighth of a mile off, steer $E. by S. \frac{1}{4} S.$, which course will lead, with not less than four and a half fathoms, to the entrance to the harbor. When abreast of the northeastern end of Cuttyhunk and about three hundred yards from the black buoy on The Middle Ground, pass to the southward of the buoy, continue the course to the eastward, and follow the directions for the harbor.

On the above courses, to enter New Bedford Harbor: 1. By the Western Channel.—On the course $NE. by E. \frac{3}{4} E.$ through the bay, when the northern end of Penikese Island bears $SE. by S. \frac{3}{4} S.$, Dumpling Rock Light-house $NE. by N. \frac{3}{8} N.$, three miles and three-quarters, and Cuttyhunk Light-house $S. by W. \frac{1}{8} W.$, three miles and a half distant,—the depth will be fifteen fathoms and the course $NE. by N. \frac{1}{4} N.$, which will lead, with not less than four fathoms, into the middle of the entrance to the West Channel, half-way between the red buoy on The Sand Spit and the black buoy on Dumpling Rocks; after which the directions for the Western Channel should be followed.

2. *By the Middle Channel.*—On the $NE. by E. \frac{3}{4} E.$ course, when Clark's Point Light-house bears $N. \frac{3}{8} E.$, five miles and a half, and Dumpling Rock Light-house $N. \frac{3}{4} W.$, two miles and a half distant, the depth will be nine and a half fathoms, "black mud," and the course $N. \frac{3}{8} E.$ for Clark's Point Light-house, which will lead directly through the Middle Channel; after which the directions for this channel should be followed.

3. *By the Eastern Channel.*—On the course $NE. by E. \frac{3}{4} E.$ through the bay, when Clark's Point Light-house bears $N. \frac{3}{4} W.$, four miles and a half, and Dumpling Rock Light-house $NW. \frac{3}{4} W.$, two miles and five-eighths distant, the depth will be eight fathoms, "blue mud," and $N. \frac{1}{4} W.$ will lead safely through the Eastern Channel to the entrance to the Inner Harbor.

On the above courses, to enter Quick's Hole.—On the $NE. by E. \frac{3}{4} E.$ course, when Dumpling Rock Light-house bears $NE. by N. \frac{3}{8} N.$, three miles and three-quarters, and Cuttyhunk Light-house $S. by W. \frac{1}{8} W.$, three miles and a half distant, the depth will be fifteen fathoms, and the course $E. by S. \frac{1}{8} S.$ for four miles and a quarter, carrying not less than seven and a half fathoms, until Gay Head Light-house bears $S. \frac{3}{8} W.$, when Dumpling Rock Light-house will bear $NW. by N. \frac{1}{2} N.$ and Clark's Point Light-house $N. \frac{1}{2} W.$ westerly. The depth will be eight and a half fathoms, "white sand and black specks," and the course $S. \frac{3}{8} W.$ for Gay Head Light-house, keeping it open a little to the eastward of the southeastern point of Nashawena. This course will lead, with not less than four and three-quarter fathoms, to abreast of the red buoy on Quick's Hole Ledge; after which the directions given on pages 157–158 should be followed.

To enter Mattapoiset Harbor.—On the course $NE. by E. \frac{3}{4} E.$ through the bay, when Wing's Neck Light-house bears $NE. \frac{3}{8} E.$, eight miles and three-quarters, and Bird Island Light-house $NE. \frac{3}{4} N.$, six miles and three-quarters distant, the latter course should be steered, carrying not less than six fathoms, until Ned's Point Light-house bears $NW. by N. \frac{3}{4} N.$, three miles distant, when a course for the light will lead, with not less than three and three-quarter fathoms, nearly up with Gallatin Rock; after which the directions for the harbor should be followed.

To enter Wood's Hole from Buzzard's Bay.—On the $NE. by E. \frac{3}{4} E.$ course through the bay, when Dumpling Rock Light-house bears $NE. by N. \frac{3}{8} N.$, three miles and three-quarters, and Cuttyhunk Light-house $S. by W. \frac{1}{8} W.$, three miles and a half distant, the depth will be fifteen fathoms and the course $E. by N.$ for ten miles and a half, carrying not less than eight fathoms, until Bird Island Light-house bears $N. by E. \frac{1}{4} E.$, seven miles and five-eighths, and Ned's Point Light-house (in Mattapoiset Harbor) $N. by W. \frac{1}{4} W.$, seven miles and a quarter distant; when the depth will be seven and three-quarter fathoms and the course $SE. by E. \frac{1}{4} E.$ for a mile and three-eighths, carrying not less than six fathoms, until Bird Island Light-house bears $N. \frac{3}{8} E.$ and the northern extremity of Long Neck $E. Southerly$, distant three-quarters of a mile. From this position the course is $S. by E. \frac{1}{4} E.$, following the directions for Wood's Hole. These courses pass two miles and a quarter to the northward of Lone Rock off Quick's Hole, and a little over half a mile to the northward and three-eighths of a mile to the eastward of Woepecket Rock.

To enter Stippoon Harbor.—On the $NE.$ course towards the head of the bay, when Bird Island Light-house bears $N. by E. \frac{3}{8} E.$, two miles, and Wing's Neck Light-house $NE. by E.$, three miles and

Sailing Directions--Buz- seven-eighths distant, the depth will be five and a half fathoms and the course **N. $\frac{1}{2}$ W.**, which will lead up to the black buoy on Seal Rocks; after which the directions for **zard's Bay.** the harbor must be followed. The course in passes nearly half a mile to the eastward of the black buoy on The Bow Bells and three-quarters of a mile to the westward of Bird Island Light-house.

To enter Wareham River.—On the **NE.** course towards the head of the bay, when Wing's Neck Light-house bears **E. by N.**, a mile and a half, and Bird Island Light-house **W. $\frac{1}{4}$ N.**, a mile and an eighth distant,—the summit of Great Hill will bear **N NW.**, two miles and a half distant, and **N.** by **W.** will lead into the entrance, carrying not less than fifteen feet at low water, until the summit of Great Hill bears **W. by S. $\frac{1}{4}$ S.**, when the depth will be fourteen feet, with Wewentic River fairly open. Beyond this it is not safe to go without a pilot. One can always be obtained at Great Hill Point or in Wewentic River. These courses pass a mile and an eighth to the westward of the black buoy on Abiel's Ledge; five-eighths of a mile to the westward of the red buoy on Dry Ledge; and about three-eighths of a mile to the eastward of the black buoy at the entrance to Wing's Cove.

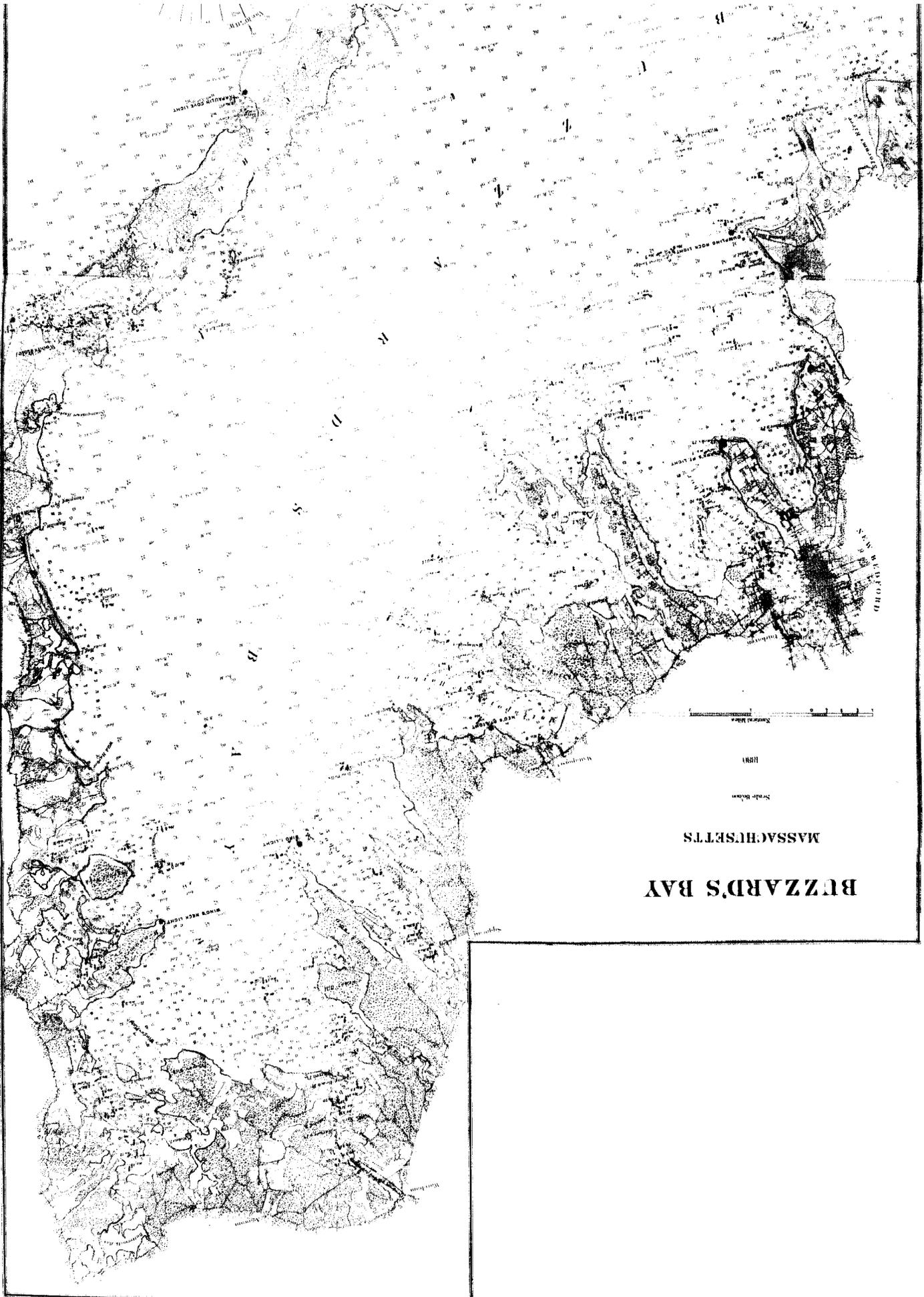
To enter Cohasset Narrows.—On the **NE.** course towards the head of the bay, when Wing's Neck Light-house bears **E. by N.**, a mile and a half, and Bird Island Light-house **W. $\frac{1}{4}$ N.**, a mile and an eighth distant, the depth will be six fathoms and the course **NE. by E. $\frac{3}{4}$ E.**, which will lead, with not less than three fathoms, to the black buoy on Wing's Neck Flats; above which it is not safe for strangers to pass without a pilot. This course passes three-eighths of a mile to the southward of the black buoy on Abiel's Ledge, and two hundred and fifty yards to the southward of the buoy on Wing's Neck Flats.

II. Having come through the Channel between No Man's Land and Martha's Vineyard, to enter and pass through Buzzard's Bay.—With Gay Head Light-house bearing **NE. by E.**, one mile distant, the course for Vineyard Sound Light-vessel is **NW. $\frac{3}{4}$ W.**, carrying not less than ten and a half fathoms. Thence the course is **N. $\frac{1}{4}$ E.**, carrying not less than ten fathoms, until Hen and Chickens Light-vessel bears **W. $\frac{1}{4}$ N.**, seven-eighths of a mile, and Cuttyhunk Light-house **SE. $\frac{1}{2}$ S.**, three miles distant; when the depth will be about ten fathoms and **NE. by E. $\frac{3}{4}$ E.** will lead safely up the bay, following the directions given above. These courses pass one mile to the westward of The Devil's Bridge, and five-eighths of a mile to the westward of the red buoy on Sow and Pigs Reef.

On the above courses, to enter Cuttyhunk Harbor.—On the **N. $\frac{1}{4}$ E.** course from Vineyard Sound Light-vessel, when abreast of the red buoy on the western end of Sow and Pigs Reef bearing **E. $\frac{1}{4}$ S.**, five-eighths of a mile distant, Cuttyhunk Light-house will bear **E. by N. $\frac{1}{4}$ N.**, and **NE. by E. $\frac{3}{4}$ E.** will lead, with not less than three and a quarter fathoms, between Penikese Island and the northeastern end of Cuttyhunk. On this course, when the striped buoy on Middle Ledge is abeam and one hundred and fifty yards off, and the eastern end of Penikese Island bears **NE. by N. $\frac{1}{2}$ N.**, steer **E. by S. $\frac{1}{4}$ S.**, following the directions for the harbor.

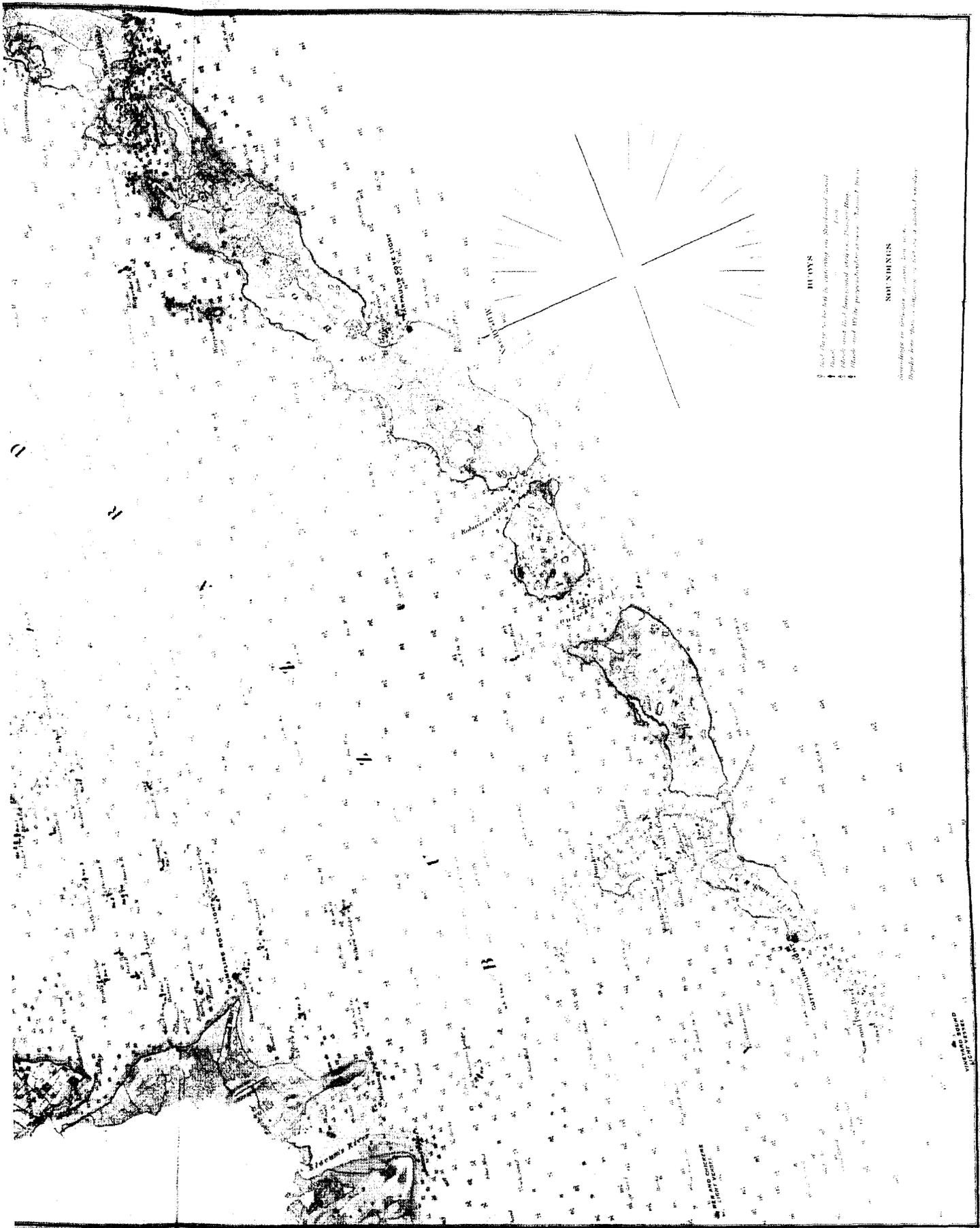
III. To come through Quick's Hole and enter Buzzard's Bay.—From abreast of the black buoy on Nashawena Flats, in six fathoms water, the course is **N. $\frac{3}{4}$ W.** for three-quarters of a mile, which leads, with not less than five fathoms, to abreast of the red buoy on Quick's Hole Ledge. Thence the course is **N. $\frac{1}{4}$ E.**, with not less than five fathoms, until Dumpling Rock Light-house bears **NW. by N. $\frac{1}{2}$ N.** and Clark's Point Light-house **N. $\frac{1}{2}$ W. Westerly.** Here the depth will be about nine fathoms, and **N. $\frac{1}{4}$ W.** will lead up to the entrance to the Eastern Channel into New Bedford; or, **NE. $\frac{1}{2}$ N.** will lead up the bay until Ned's Point Light-house bears **N. $\frac{1}{2}$ E.** and Bird Island Light-house **NE. $\frac{3}{4}$ N.**, when the depth will be eight fathoms, and **NE.** should be steered, following the directions given above. These courses pass three hundred yards to the eastward of the black buoy on Nashawena Flats; one hundred and fifty yards to the westward of the red buoy on Quick's Hole Ledge; and a quarter of a mile to the eastward of the striped buoy on Lone Rock.

On the above courses, to enter Cuttyhunk Harbor.—On the **N. $\frac{1}{4}$ E.** course, when within three-eighths of a mile of the striped buoy on Lone Rock, with Dumpling Rock Light-house bearing **N NW.**, you will have four and three-quarter fathoms, and **W. by S. $\frac{1}{4}$ S.** will lead, with not less than four and a half fathoms, between Gull Island and the northwestern end of Nashawena. When, on this course, Gull Island bears **N. by W.** and the northeastern end of Cuttyhunk **W. $\frac{1}{4}$ S.**, steer **SW. $\frac{1}{4}$ S.** to the anchor.



BUZZARD'S BAY
MASSACHUSETTS

1881
Scale in Fathoms



BUOYS

1 Red Buoy to be lit at intervals on the ground and
 2 Black Buoy to be lit at intervals on the ground and
 3 White Buoy to be lit at intervals on the ground and
 4 Black and White Buoy to be lit at intervals on the ground

SOUNDINGS

Soundings in fathoms of water, from mean
 low water, are indicated by the following symbols:

100 FATHOMS
 200 FATHOMS
 300 FATHOMS
 400 FATHOMS
 500 FATHOMS
 600 FATHOMS
 700 FATHOMS
 800 FATHOMS
 900 FATHOMS
 1000 FATHOMS

IV. Having come through Wood's Hole, to enter and pass through Buzzard's Sailing Directions--Buzzard's Bay.—When past Middle Ledge and up with the striped buoy on Hadley's Rock, (having it bearing **S.** by **E.** $\frac{1}{4}$ **E.**, distant nearly an eighth of a mile,) **N.** by **W.** $\frac{1}{4}$ **W.** will lead safely into the bay, passing to the westward of the red spar-buoy on Long Neck Rock and to the eastward of the black spar-buoy on Naushon Point Shoal, and carrying not less than four and a quarter fathoms water. On this course, when Ned's Point Light-house bears **N.** by **W.** $\frac{3}{4}$ **W.**, eight miles and a quarter, and Bird Island Light-house **N.** $\frac{3}{8}$ **E.**, eight miles and an eighth distant, Clark's Point Light-house will bear **NW.** by **W.**, nearly ten miles; Dumpling Rock Light-house **W.** by **N.** $\frac{1}{8}$ **N.**, ten miles; and Wing's Neck Light-house **N.** by **E.** $\frac{1}{8}$ **E.**, nearly nine miles distant. The depth will be six fathoms, and from this position the course for New Bedford Entrance will be **WNW.**, carrying not less than five and a half fathoms, until Clark's Point Light-house bears **NW.** by **N.** $\frac{3}{8}$ **N.** and Dumpling Rock Light-house **W.** by **S.** $\frac{1}{2}$ **S.**; when the depth will be five and a half fathoms, and **N.** by **W.** will lead to the entrance to the Inner Harbor. These courses pass three-eighths of a mile to the northward of the buoy on Woepecket Rock; nearly a mile to the southward of the black buoy on West Island Point; half a mile to the southward of the red buoy on West Island Ledge; five-eighths of a mile to the northward of Hursell Rock; three-eighths of a mile to the southward, and half a mile to the westward, of the red buoy on Mosher Ledge.

Or, wishing to enter Mattapoiset Harbor.—With Ned's Point Light-house bearing **N.** by **W.** $\frac{3}{4}$ **W.** and Bird Island Light-house **N.** $\frac{3}{8}$ **E.**, as before, the course will be **N.** by **W.** $\frac{3}{8}$ **W.**, carrying not less than five and a half fathoms, until Bird Island Light-house bears **NE.** $\frac{3}{4}$ **N.**, nearly four miles, and Wing's Neck Light-house **NE.** $\frac{1}{8}$ **E.**, nearly six miles distant, when the depth will be six fathoms, "blue mud," and **NW.** by **N.** $\frac{3}{4}$ **N.** will lead directly for Ned's Point Light-house and as far up as Gallatin Rock with not less than three and three-quarter fathoms. These courses pass a quarter of a mile to the eastward of the striped buoy on Nye's Ledge, and the same distance to the eastward of Gallatin Rock.

Wishing to enter Sippican Harbor.—With Ned's Point Light-house bearing **N.** by **W.** $\frac{3}{4}$ **W.** and Bird Island Light-house **N.** $\frac{3}{8}$ **E.**, as before, **N.** $\frac{1}{8}$ **W.** will lead, with not less than four fathoms, into the harbor and as far up as Seal Rocks. This course passes half a mile to the eastward of The Bow Bells, and five-eighths of a mile to the westward of Bird Island Light-house.

Or, if bound up the Bay: When Ned's Point Light-house bears **N.** by **W.** $\frac{3}{4}$ **W.** and Bird Island Light-house **N.** $\frac{3}{8}$ **E.**, as before, **N.** by **E.** will lead, with not less than three fathoms, up the bay, until Bird Island Light-house bears **W.** $\frac{1}{4}$ **N.**, a mile and an eighth, and Wing's Neck Light-house **E.** by **N.**, a mile and a half distant; when the depth will be six fathoms, and **N.** by **W.** will lead to the entrance to Wareham River with not less than fifteen feet; and **NE.** by **E.** $\frac{3}{4}$ **E.** will lead, with not less than three fathoms, to the entrance to Cohasset Narrows. The **N.** by **E.** course up the bay passes a mile and a quarter to the westward of Hamlin Point Rocks; the same distance to the westward of the red buoy on Gifford's Ledge; a little over a mile to the westward of the red buoy on the southern end of Southwest Ledge; exactly a mile to the westward of the red buoy on the northern end of the same ledge; and three-quarters of a mile to the eastward of Bird Island Reef.

HARBORS IN BUZZARD'S BAY.

The principal harbors in this bay lie on the northern shore, although good anchorage is found in the numerous small coves on the eastern and southern shores. Of those on the northern shore, but one (New Bedford) is of much commercial importance at present; while those on the southern shore, with the exception of Wood's Hole, are worthy of mention only as anchorages.

CUTTYHUNK HARBOR.

This harbor, a semicircular cove about three-quarters of a mile wide, is formed by the western end of Nashawena, the eastern end of Cuttyhunk, and a long spit extending from the latter to within a hundred and fifty yards of Nashawena. Anchorage in from two to four fathoms is found here, although somewhat exposed to easterly and northeasterly winds. It is sheltered on the north by Penikese Island and the shoals connecting that island with Gull Island,—(a low islet three-eighths of a mile to the southward of Penikese,)—and is sometimes used by weather-bound coasters.

The eastern shore of this harbor is formed by the western end of Nashawena Island, and is composed of a series of sand hillocks covered only with grass. The western shore is formed by the northeastern end of Cuttyhunk, composed of nearly level land, partly under cultivation. The southern shore is formed by the low sand-spit above mentioned, which terminates at its eastern end in a number of sand hillocks with a few trees upon them. There is no passage between this sand point and Nashawena, but the opening between the two is known as Canapissett Gut.

DANGERS

IN APPROACHING AND ENTERING CUTTYHUNK HARBOR.

I. *From the Westward, having come through the Main Channel into Buzzard's Bay.*—Being abreast of Hen and Chickens Light-vessel and wishing to enter Cuttyhunk Harbor, the course leads to the eastward; and there will soon appear, well to the southward, bearing about **SE. $\frac{1}{2}$ S.**, and about a mile off, a nun-buoy,* painted red and black in horizontal stripes. This is on Ribbon Reef, a detached ledge, with fifteen feet at low water, which lies two miles **SE. $\frac{3}{4}$ E.** from Hen and Chickens Light-vessel and nearly a mile and a half **NW. $\frac{1}{4}$ W.** from Cuttyhunk Light-house. The buoy is of the second class, and is placed in four fathoms off the north-western end of the reef. Vessels of the largest size will find plenty of water on all sides of the shoal by giving the buoy a berth of a quarter of a mile.

When past Ribbon Reef the course continues to the eastward, and on nearing Penikese Island a black spar-buoy will be seen directly ahead and half a mile off. This is on The Middle Ground, a detached ledge, with eight feet at mean low water, lying almost exactly in the middle of the passage between Penikese and Cuttyhunk islands. From the buoy it extends to the north-westward about four hundred yards, leaving a passage three hundred yards wide, with four and a half fathoms, between it and Penikese; but it is usual to pass to the southward of the buoy, between it and Cuttyhunk.

The Middle Ground buoy is marked No. 1, placed on the southeastern end of the ledge, and bears from

	Miles.
Hen and Chickens Light-vessel, E. by S. $\frac{3}{8}$ S. -----	a little over 4
Ribbon Reef buoy, E. $\frac{1}{4}$ N. -----	2 $\frac{3}{8}$
The southern end of Penikese Island, S. by W. $\frac{3}{4}$ W. -----	3 $\frac{1}{8}$

From this buoy Gull Island Ledge buoy bears **E. $\frac{1}{2}$ S.**, three-eighths of a mile, and the striped buoy on Middle Ledge **SE.**, four hundred yards distant.

When up with The Middle Ground buoy another black spar-buoy will be seen nearly ahead, and two striped buoys to the southward of the course, off the northeastern end of Cuttyhunk. Of these, the first met with on entering the harbor will be the striped buoy on Middle Ledge, which lies nearly in the middle of the channel and has thirteen feet at mean low water. The buoy is painted red and black in horizontal stripes, and placed close to the western side of the rock, which is very small. It bears from the black buoy on The Middle Ground **SE.**, four hundred yards, and from the extreme northern end of Cuttyhunk Island **NE. by E. $\frac{1}{4}$ E.**, half a mile distant. From this buoy

The black buoy on Gull Island Ledge bears NE. by E. $\frac{3}{4}$ E. -----	$\frac{1}{8}$ mile.
The middle of Gull Island NE. by E. -----	$\frac{3}{4}$ "
The striped buoy on Edwards' Rock S. $\frac{1}{4}$ W. -----	300 yds.
The red buoy on Whale Rock S. by W. -----	$\frac{1}{8}$ mile.

Vessels may pass on either side of the buoy on Middle Ledge by giving it a berth; but it is usual to pass to the northward of it.

Continuing to the eastward, after passing Middle Ledge, the course leads about three hundred yards to the southward of a black spar-buoy, marked No. 3. This is on Gull Island Ledge, a large shoal extending to the southwestward from the southern side of Penikese and the southwestern side of Gull Island, with soundings over it varying from five to eleven feet. The buoy is placed on the southwestern end of this reef in sixteen feet and bears from

	MILE.
The black buoy on The Middle Ground, E. $\frac{1}{2}$ S. -----	$\frac{3}{8}$
The striped buoy on Middle Ledge, NE. by E. $\frac{3}{4}$ E. -----	$\frac{1}{8}$
The middle of Gull Island, SW. $\frac{1}{8}$ W. -----	$\frac{1}{2}$
The southwestern end of Penikese Island, SE. by S. $\frac{1}{4}$ S. -----	900 yds.

From this buoy the black buoy on Gull Island Point bears **E. $\frac{1}{4}$ S.**, three-eighths of a mile, and the red buoy on Pease's Ledge **S. by W. $\frac{1}{4}$ W.**, five-eighths of a mile distant.

When abreast of Gull Island Ledge the course turns to the southward, and two spar-buoys will be seen well to the westward and close together. The northernmost, which is painted red and black in horizontal stripes, is on Edwards' Rock; and the other, which is red, is on Whale Rock,—both on the western side of the entrance.

Edwards' Rock is the northernmost of the shoals **NE.** of Cuttyhunk, and has nine feet at mean low water upon it. From abreast of Gull Island Ledge the buoy (which is on its northeastern end, in fifteen feet water) bears **SW. $\frac{1}{4}$ W.**, a quarter of a mile off; and the sailing-line passes well to the eastward of it. From this buoy Gay Head Light-house will appear in the middle of the opening of Canapissett.

The southernmost of the two buoys is a red spar (No. 4) and is placed to the northeastward of Whale Rock, a small rock, awash at half tide, which lies a little over a quarter of a mile from the northeastern end of Cuttyhunk and about two hundred yards to the southwestward of Edwards' Rock. From this buoy the red buoy on Pease's Ledge bears S. by E. $\frac{3}{4}$ E., six hundred yards distant. *Whale Rock.*

Pease's Ledge, the red spar-buoy on which will be seen from off Gull Island Ledge, is the last danger met with in entering the harbor. It lies four hundred yards from the Cuttyhunk shore, is covered only at half tide, and is marked by a red spar-buoy (No. 6) placed in twelve feet close to its northeastern end. This buoy bears from *Pease's Ledge.*

	Mile.
The red buoy on Whale Rock, S. by E. $\frac{3}{4}$ E.-----a little over	$\frac{1}{3}$
The black buoy on Gull Island Ledge, S. by W. $\frac{1}{4}$ W.-----	$\frac{5}{8}$
The northeastern end of Cuttyhunk, SE. by E. $\frac{1}{2}$ E.-----	$\frac{1}{2}$

The sailing-line passes well to the eastward of it, and good anchorage is found in from two to three fathoms,—the deepest water being on the Nashawena side.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING CUTTYHUNK HARBOR.

I. *From the Westward, having come through the Main Channel into Buzzard's Bay.*—Being about an eighth of a mile S. $\frac{1}{2}$ E. from Hen and Chickens Light-vessel, steer E. by S. $\frac{1}{4}$ S., carrying not less than four and a half fathoms, until up with the northeastern end of Cuttyhunk and about three hundred yards from the black buoy on The Middle Ground. Pass to the southward of this buoy in about three fathoms, and continue the course until you come abreast of the black buoy on Gull Island Ledge. When the eastern extremity of Penikese Island bears N. by E. (with Gull Island Ledge buoy nearly in range with it) and the extreme northern end of Cuttyhunk bears SW. by W. $\frac{3}{4}$ W., five-eighths of a mile distant, steer S. by E. $\frac{1}{2}$ E., carrying not less than three fathoms, and anchor at discretion.

The above courses pass a little over five-eighths of a mile to the northward of Ribbon Reef; about fifty yards to the southward of the black buoy on The Middle Ground; a hundred yards to the northward of the striped buoy on Middle Ledge; an eighth of a mile to the southward of the black buoy on Gull Island Ledge; four hundred and fifty yards to the eastward of the striped buoy on Edwards' Rock; nearly six hundred yards to the eastward of the red buoy on Whale Rock; and the same distance to the eastward of the red buoy on Pease's Ledge.

Or, wishing to anchor under Penikese Island.—From the above-mentioned position, an eighth of a mile S. $\frac{1}{2}$ E. from Hen and Chickens Light-vessel, steer E. by S., carrying not less than four and a half fathoms, and passing nearly five hundred yards to the northward of the black buoy on The Middle Ground and three hundred yards to the southward of the southern end of Penikese. When nearly in line between the two, steer NE. by E. $\frac{3}{4}$ E. for about six hundred yards, and anchor in from two to three fathoms about four hundred yards from the southeastern shore of Penikese.

DANGERS

IN APPROACHING AND ENTERING CUTTYHUNK HARBOR.

II. *From the Westward, having come through the Channel between No Man's Land and Martha's Vineyard.*—On the course N. $\frac{1}{4}$ E. from Vineyard Sound Light-vessel into Buzzard's Bay there will be seen, immediately on leaving the light-vessel, a red can-buoy bearing about NE. $\frac{3}{4}$ N. and nearly a mile off. This is on Sow and Pigs Reef, making off from the western end of Cuttyhunk nearly W SW. for a mile and three-eighths. It is bare in several places at mean low water and has a number of boulders, which are always out, scattered along its length. The buoy is of the first class, marked No. 2, has the words "Sow and Pigs" painted in white letters on its head, and bears from *Sow and Pigs Reef.*

	Miles.
Vineyard Sound Light-vessel, NE. $\frac{3}{4}$ N.-----	1
Hen and Chickens Light-vessel, SE. by S. $\frac{1}{8}$ S.-----nearly	$3\frac{1}{4}$
Cuttyhunk Light-house, W SW.-----	1 $\frac{1}{2}$

When past this buoy the dangers met with are common to all the passages from the westward, and have been already described above.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING CUTTYHUNK HARBOR.

II. *From the Westward, having come through the Channel between No Man's Land and Martha's Vineyard.*—On the N. $\frac{1}{4}$ E. course from Vineyard Sound Light-vessel, when abreast of the red buoy on the western end of Sow and Pigs Reef bearing E. $\frac{1}{4}$ S., five-eighths of a mile distant, Cuttyhunk Light-house will bear E. by N. $\frac{1}{4}$ N., and NE. by E. $\frac{3}{4}$ E. will lead, with not less than three and a quarter fathoms, along the western face of Cuttyhunk Island and up to the entrance to the harbor. On this course, when the striped buoy on Middle Ledge is abeam and one hundred and fifty yards off and the eastern end of Penikese Island bears NE. by N. $\frac{1}{2}$ N., steer E. by S. $\frac{1}{4}$ S. for nearly a quarter of a mile, which will bring you up with the black buoy on Gull Island Ledge. When this buoy is abeam, bearing N. by E. $\frac{1}{4}$ E., an eighth of a mile distant, the eastern end of Penikese Island N. by E., and the extreme northern end of Cuttyhunk SW. by W. $\frac{3}{4}$ W., five-eighths of a mile distant, steer S. by E. $\frac{1}{2}$ E. to the anchorage, as before.

The above courses pass five-eighths of a mile to the westward and six hundred yards to the northward of the red can-buoy on Sow and Pigs Reef; a mile to the eastward of Ribbon Reef; an eighth of a mile to the southward of the black buoy on The Middle Ground; and one hundred and fifty yards to the northward of the striped buoy on Middle Ledge.

DANGERS

IN APPROACHING AND ENTERING CUTTYHUNK HARBOR.

III. *From the Eastward.*—This is the easiest and safest way of entering this harbor, the channel being about six hundred yards wide and unobstructed except by Gull Island Point, a rocky shoal, with nine feet at mean low water, lying nearly two hundred yards to the southward of Gull Island. There is a sandy shoal, covered only at high water, between this reef and the island, and a narrow passage close under the southern end of the latter, which is, however, unsafe for strangers. The southern end of the ledge is marked by a black spar-buoy (No. 5) placed in fifteen feet water. It bears from

	Miles.
The striped buoy on Lone Rock, W. by S. $\frac{3}{4}$ S. -----	2 $\frac{5}{8}$
The eastern end of Penikese, S. by E. $\frac{3}{4}$ E. -----	2 $\frac{3}{8}$
The northwestern end of Nashawena, N. by W. $\frac{3}{4}$ W. -----	nearly $\frac{1}{2}$

being exactly on a line between the two points. From this buoy the black buoy on Gull Island Ledge bears W. $\frac{1}{4}$ N., three-eighths of a mile, and the anchorage near the head of the harbor S. by W. $\frac{1}{2}$ W., three-quarters of a mile distant.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING CUTTYHUNK HARBOR.

III. *From the Eastward, by the Main Channel of Buzzard's Bay.*—On the course SW. $\frac{1}{2}$ W. towards the entrance of Quick's Hole, when Clark's Point Light-house bears N. $\frac{1}{2}$ W. Westerly and Dumpling Rock Light-house NW. by N. $\frac{1}{2}$ N., you will have about nine fathoms, and should steer SW. by W. $\frac{1}{8}$ W., carrying not less than four and a half fathoms, between Gull Island and the northwestern end of Nashawena. When the middle of Gull Island bears N. by W., the northwestern end of Nashawena S. by E., and the northeastern end of Cuttyhunk W. $\frac{3}{4}$ S., steer SW. $\frac{1}{4}$ S. into the harbor, and anchor at discretion. These courses pass eight hundred yards to the northward of Lone Rock; four hundred yards to the southward of the black buoy on the southern end of Gull Island Point; and a quarter of a mile to the northward of the northwestern end of Nashawena.

IV. *Having come through Quick's Hole, to enter Cuttyhunk Harbor.*—On the N. $\frac{1}{4}$ E. course from Quick's Hole into Buzzard's Bay, when within three-eighths of a mile of the striped buoy on Lone Rock, with Dumpling Rock Light-house bearing NNW., you will have four fathoms and three-quarters, and W. by S. $\frac{1}{4}$ S. will lead, with not less than four and a half fathoms, between Gull Island and the northwestern end of Nashawena. When the former bears N. by W., the latter S. by E., and the northeastern end of Cuttyhunk W. $\frac{3}{4}$ S., steer SW. $\frac{1}{8}$ W. to the anchorage. These courses pass six hundred yards to the southward of Lone Rock buoy, and three hundred and fifty yards to the northward of the northeastern end of Nashawena.

NEW BEDFORD HARBOR

lies at the mouth of the **Acushnet River** and was formerly the principal whaling port of the United States. It is easy of access, although the approach is much obstructed by outlying ledges. These are, however, well buoyed and the harbor well lighted, so that strangers need not fear to enter it, following the directions given below. It is naturally divided into an **Inner** and **Outer** harbor,—the former comprising all that portion to the northward of **Clark's Point**, and the latter, which is a mere roadstead, open to southerly winds, embracing all that portion to the southward of **Clark's Point** and between **Scouticut Neck** and **Round Hill**. Sixteen feet at mean low water may be taken through a narrow and crooked channel to abreast of the town; but not more than eleven feet up to the bridge.

As before remarked, (see page 186,) the western point of entrance to this harbor is called **Round Hill Point**, and receives its name from the remarkable round grassy hillock, with precipitous face to the southwestward, which rises abruptly from the otherwise low flat land just back of the extremity of the point. It is called **Round Round Hill Point Ell**, and is one of the principal landmarks in this vicinity. (See View.)

A reef of bare rocks, called **The Dumplings**, extends out from **Round Hill Point** to the southeastward, on the outermost of which is built a light-house, called **Dumpling Rock Light-house**. The lantern is on top of a small white dwelling, and shows a fixed white light, of the fifth order, from a height of forty-two feet above the sea, visible twelve miles. Its geographical position is

Latitude ----- 41° 32' 16" N.
Longitude ----- 70° 55' 18" W.,

and it bears from

	Miles.
Hen and Chickens Light-vessel, NE. ¼ E. -----	6 ½
Cuttyhunk Light-house, N. by E. ¾ E. -----	7 ½
The entrance to Quick's Hole, N. by W. ¾ W. -----	5 ½
The entrance to Wood's Hole, W. by N. ¼ N. -----	10

During thick weather a bell is struck by machinery twice in quick succession, alternately with a single blow, at intervals of thirty seconds. From this light-house **Clark's Point Light-house** bears **NE.** by **N. ¾ N.**, three miles and a quarter distant. The **Western Channel** into **New Bedford** leads close along by this light-house, between the black buoy on **The Dumplings** and the red buoy on **The Sand Spit**. The city of **New Bedford** will be plainly visible over the low land at the head of **Clark's Cove**,—bearing about **N. ¾ E.**

From **Round Hill Point** the western shore turns abruptly to the northward,—running about **N. ¾ W.** for nearly two miles to the entrance to **Apponagansett Bay**, or **Padanaram Harbor** as it is sometimes called. The shores between **Round Hill** and the bay are quite low and flat, diversified with cultivated fields and groves of trees, and dotted with houses.

This bay or cove is in reality a narrow arm of **Buzzard's Bay**, a little over half a mile wide at its mouth, and gradually contracting to less than a quarter of a mile abreast of the village of **Padanaram**, where it is crossed by a bridge. Good anchorage in two fathoms, soft bottom, may be found in this bay, and ten feet at mean low water may be taken through a very narrow channel as far as the lower wharves, just below the bridge. The village is built on the eastern shore of the bay, nearly three-quarters of a mile above **Rickettson's Point**,—its northeastern point of entrance. Both shores are low and nearly level, and for the most part cleared, cultivated and settled.

Apponagansett Bay.

Just above **Rickettson's Point** is the entrance to **Clark's Cove**, a long indentation extending about **N. ¼ W.** for a mile and a half, with an average width of five-eighths of a mile and a depth of water of from nine to eighteen feet. Its entrance is contained between **Clark's Point** on the east and **Mosher's Point** on the west,—both shores being gently sloping, for the most part cleared and cultivated, with occasional groves of trees separating the cleared fields. Good anchorage is found in this cove in from two to three fathoms, soft bottom, well sheltered from all except southerly winds: and it is almost entirely unobstructed. **Clark's Point**, which separates this cove from the **Inner Harbor** of **New Bedford**, is a nearly level peninsula, almost entirely cleared and well settled, but showing occasional groves of trees. It is easily recognized, on coming into the harbor, by the large granite fort on its southern extremity, a little to the eastward of which will be seen a white tower, from which the light was formerly shown.

Clark's Cove.

The present light-house is on the fort, and is called **Clark's Point Light-house**. It shows a fixed white light, of the fifth order, from a height of sixty-eight feet above the sea, visible thirteen miles. Its geographical position is

Latitude ----- 41° 35' 32" N.
Longitude ----- 70° 54' 5" W.,

and it bears from

	Miles.
Dumpling Rock Light-house, NE. by N. ¾ N. -----	a little over 3 ½
The entrance to Quick's Hole, N. ¼ W. -----	nearly 8 ¾
The entrance to Wood's Hole, NW. by W. -----	nearly 10

The eastern shore of the **Outer Harbor** is formed, as before remarked, (see page 190,) by **Scouticut Neck**, a long peninsula of low, nearly flat land, well wooded except near the shore line, where cleared and cultivated fields are seen dotted with houses. Its southern extremity, called **Scouticut Point**, bears from **Clark's Point Light-house** **SE.** by **E. ¼ E.**, nearly two miles and a quarter distant. It is dangerous to approach this point on account of

Scouticut Neck.

the many outlying ledges off its southern end. The western shore of the neck runs about **N. $\frac{1}{4}$ W.** for two miles and five-eighths, where it joins the mainland; and here the shore turns abruptly to the westward, running first about **NW.** by **W.** for three-quarters of a mile; then about **SW.** for a little over half a mile; and then **W. $\frac{1}{4}$ N.** to the northeastern point of entrance to the Inner Harbor. Thus is formed a large and wide cove, in which anchorage may be found in from ten to sixteen feet, sheltered from all except southerly winds. In coming into the harbor from the eastward a large high rock will be seen off Sconticut Point, and distant from it four hundred yards in a **WSW.** direction. This is called **Black Rock.**

The northeastern point of entrance to the Inner Harbor is called Fort Point, and seen from the southward will appear as a rocky point of moderate height, with flat summit, on which stands a white-walled fort surmounted by an earthwork. There is also a large white building, formerly used as a barrack; and about an eighth of a mile to the eastward of this will be seen a large white triangular beacon. This is called **Fort Point Beacon,** and is used in connection with the beacon on Egg Rock as a range in coming into the Eastern Channel. The tall conical beacon, which will be visible a little to the eastward of the fort, is on **Egg Rock,** to the southwestward of the **Egg Islands,**—two low, bare, rocky islets, lying **NNE.** and **SSW.** from each other, and nearly half a mile apart. They occupy the middle of the flats making off from Fort Point to the southward, and separating the harbor proper from the large cove contained between Fort Point and Sconticut Neck.

The western shore of the harbor has a general course about **N. $\frac{1}{4}$ W.** for nearly two miles to the city of New Bedford, and is low, nearly level, under fine cultivation, diversified with ornamental grounds surrounding handsome houses. When a little above Clark's Point, Palmer's Island will be seen to the northward about a mile and a half off, and apparently in the middle of the passage. It will appear as a high rocky islet with undulating surface, a few low spruce trees showing here and there, and a white house to the eastward of them. On approaching this island its northern part will be seen to be quite low and flat, and a white light-tower, with another white house near it, will be visible. This is Palmer's Island Light-house, built on the northeastern extremity of the island, and serving as a guide to the anchorage off the town. It is thirty-four feet high, and shows a fixed white light, of the fifth order, from a height of thirty-eight feet above the sea, visible twelve miles. Its geographical position is

Latitude	41° 37' 35" N.
Longitude	70° 54' 33" W.,

and it bears from Clark's Point Light-house **N.,** nearly two miles, and from Egg Rock Beacon **NW.** by **N. $\frac{1}{4}$ N.,** a little over a mile and a quarter distant. The tower stands on a stone causeway extending out from the island for one hundred feet.

The large square brick tower surmounting a church on the eastern side of the harbor is what remains of **Fairhaven Spire,** which was formerly one of the principal landmarks for making New Bedford Harbor; but the whole of the conical part of the spire was destroyed in a great gale some years ago and has not been rebuilt.

The two large stone buildings, with three tall chimneys, which will appear in range with Palmer's Island, are the **Wamsutta Mills,** situated on the western side of the harbor, about two-thirds of a mile above the bridge, and form, with Palmer's Island Light-house, the range for coming into the harbor after passing Butler's Flats. The small village on the eastern shore, exactly opposite to New Bedford, is called **Fairhaven,** and is connected with the former by the bridge above mentioned.

Between Palmer's Island and Fort Point the channel is extremely narrow,—being in some places scarcely two hundred yards in width;—but above the light-house it is somewhat wider, and keeps the Fairhaven shore for about a quarter of a mile, when it turns to the northwestward, running directly towards the wharf-line of the city at its point of junction with the bridge. The draw in the bridge is close in with the wharf-line and is not visible until nearly up with it.

On the Fairhaven side, half a mile above Palmer's Island Light-house and two hundred and fifty yards from shore, will appear a low, flat, grassy islet, with perpendicular sandy faces, and one or two small bushes on its surface. This is **Crow Island,** and serves as a mark for the turning-point in the channel, which turns to the northwestward about two hundred and fifty yards below the island.

About midway of the bridge connecting New Bedford and Fairhaven will be seen another low and flat islet, with several houses upon it, called **Pope's Island.** The bridge crosses its southern end, and thence to the westward, to another low islet covered with buildings, and lying close in with the New Bedford shore. The draw in the bridge is just on the western side of this last-mentioned islet, which prevents it from being seen until nearly up with it.

Sixteen feet at mean low water can be taken to the anchorage just above Palmer's Island; but only eleven feet in channel way to the New Bedford wharves, and this through a very narrow channel, fit only for towing or steaming.

DANGERS

IN APPROACHING AND ENTERING NEW BEDFORD HARBOR.

I. By the Western Channel.—When abreast of Penikese Island, on the **NE.** by **E. $\frac{1}{4}$ E.** course up the bay, if bound in by the Western Channel, the course turns to the northward, leading nearly for Dumppling Rock Light-house. On this course there are no dangers in the channel; but if beating in, vessels should look out, when standing to the eastward, for **Wilkes' Ledge,** on the eastern side of the entrance, about three-quarters of a mile from the middle of the channel. It is marked by a can-buoy* of the first class, painted red and black in horizon-



Black Rock

Black shore of the bay
at night - 100 ft. distance

Approach to New Bedford by Eastern Channel, Cape Point, New Bedford, N. by W. 1/2 W. distance 3 1/2 Miles.

Light House



Light House

Towers in New Bedford

Light House

Light House

Light House

West Entrance to New Bedford, Pumping Station, New Bedford, N. by W. distance 1 1/2 Miles.

tal stripes, and placed in sixteen feet on its southern side. Wilkes' Ledge has nine feet at mean low water and eight at low spring tides, and the buoy on it bears from Dumpling Rock Light-house S. $\frac{1}{2}$ E., one mile and three-quarters, and from Hen and Chickens Light-vessel NE. by E. $\frac{1}{2}$ E., six miles and an eighth distant. From the buoy Clark's Point Light-house bears N. by E. $\frac{3}{4}$ E., four miles and three-quarters, and the red buoy on the western end of The Sand Spit N. Westerly, a mile and an eighth distant. To avoid Wilkes' Ledge, in beating in by this channel, vessels should not stand to the eastward of Dumpling Rock Light-house bearing N. $\frac{1}{4}$ E.

After passing Wilkes' Ledge, if standing to the westward, it is necessary to look out for Salter's Point Ledge, out at extreme low tides, and marked by a black spar-buoy (No. 5) placed in fifteen feet water on its eastern side and close to it. This buoy bears from

Salter's Point Ledge.

	Miles.
Mishaum Point, NE. by E. $\frac{1}{4}$ E. -----	1
Dumpling Rock Light-house, SW. $\frac{1}{2}$ W. -----	1
Wilkes' Ledge buoy, NW. $\frac{1}{8}$ N. -----	1 $\frac{3}{8}$
Hen and Chickens Light-vessel, NE. $\frac{1}{4}$ E. -----	nearly 6

To avoid it, vessels should not stand to the westward of Dumpling Rock Light-house bearing NE. $\frac{1}{2}$ N.

On approaching the light-house, when about a mile from it, a red can-buoy* will be seen to the eastward of the course and about five-eighths of a mile off, and a black spar-buoy to the northward of the course, close in with the light-house, and about three-quarters of a mile off. The former is on The Sand Spit, a shoal with seven feet water, about a quarter of a mile long in an E. and W. direction, and lying on the southeastern side of the entrance to this channel. The buoy (marked No. 4) is placed in sixteen feet on its western side, and bears from the buoy on Wilkes' Ledge N. Westerly, one mile and a quarter, and from Dumpling Rock Light-house S. by E. $\frac{5}{8}$ E., half a mile distant. To avoid it, at night, vessels should not stand to the eastward of Clark's Point Light-house bearing N. by E. $\frac{3}{4}$ E.

The Sand Spit.

The black spar-buoy on the northern side of the entrance is on the southwestern extremity of the shoal water surrounding the Dumpling Rocks. These rocks, before described, (see page 205,) make off from Round Hill Point in a SE. $\frac{1}{4}$ E. direction for about half a mile. They form a line of rocky islets, on the easternmost of which is built the light-house, and are surrounded by shoal water and sunken ledges. The buoy, which is marked No. 7, is placed in three fathoms off the southeastern end of the reef, and bears from

Dumpling Rocks.

Dumpling Rock Light-house, S. $\frac{1}{2}$ E. -----	nearly 400 yds.
The can-buoy on The Sand Spit, NW. by N. $\frac{1}{8}$ N. -----	650 "
Wilkes' Ledge buoy, N. $\frac{1}{2}$ W. -----	1 $\frac{1}{8}$ miles.

When up with the buoy on Dumpling Rocks two spar-buoys nearly in line with each other, and about seven-eighths of a mile to the eastward, will be seen, bearing about E. $\frac{1}{4}$ N. These are on Great Ledge, a detached shoal, about four hundred and fifty yards in diameter, and awash at its shoalest part. The westernmost of the two buoys, which is painted red and marked No. 6, is placed upon the western end of the shoal in three fathoms water, bearing from Wilkes' Ledge buoy NE. by N. $\frac{1}{2}$ N. and from Dumpling Rock Light-house E. $\frac{3}{8}$ S. Clark's Point Light-house bears from this buoy N. $\frac{3}{8}$ E., three miles and an eighth distant.

Great Ledge.

Great Ledge is not in the way of vessels using the Western Channel unless they are standing to the eastward on a wind, in which case they should not go to the eastward of Clark's Point Light-house bearing N. by E.

When to the northward of Dumpling Rock Light-house it will be necessary to look out for Middle Ledge,—the striped buoy on which will soon appear a little to the northward of the course, bearing about N NE., and three-quarters of a mile off. The ledge has three feet water upon it at low tides, and from four to five fathoms on all sides of it. The buoy is placed on its southeastern side in eighteen feet water,—bearing from Dumpling Rock Light-house NE. $\frac{3}{4}$ N., a mile and a quarter, and from the red buoy on the western end of Great Ledge N. by W., a mile and an eighth distant. From this buoy

Miles.

The striped spar-buoy on Inez Rock bears NE. by N. $\frac{7}{8}$ N. -----	$\frac{3}{8}$
The red spar-buoy on Church Rock (on eastern side of the channel) E. $\frac{1}{8}$ S. -----	$\frac{1}{8}$
Clark's Point Light-house N. by E. $\frac{3}{4}$ E. -----	2 $\frac{1}{8}$

The black spar and striped spar-buoys seen to the westward of Middle Ledge are not in this channel, but are on Lone Rock and Hussey Rock, in the approaches to Apponagansett Bay. Vessels using the Western Channel should not, in order to avoid Middle Ledge, go to the westward of Clark's Point Light-house bearing N. by E. $\frac{3}{8}$ E.

Inez Rock is a small detached ledge, with six feet at mean low water, lying three-eighths of a mile NE. by N. $\frac{3}{8}$ N. from the buoy on Middle Ledge and a mile and a half NE. by N. from Dumpling Rock Light-house. It is marked by a spar-buoy painted red and black in horizontal stripes, and placed in sixteen feet on its eastern side and close-to,— Clark's Point Light-house bearing N. by E. $\frac{5}{8}$ E., a mile and three-quarters distant. When near it vessels should not stand to the westward of this light-house bearing N. by E.

When up with Middle Ledge a red spar-buoy will be seen about three-quarters of a mile to the eastward, bearing nearly E. This is on Church Rock, a detached ledge, with nine feet at mean low water and from three to five fathoms on all sides of it. The buoy is in three fathoms on its southwestern side, is marked No. 6 A, and bears from Dumpling Rock Light-house NE. by E. Easterly, a mile and three-quarters, and from Clark's Point Light-house S. $\frac{1}{4}$ E., two miles distant. To avoid it, as well as Decatur Rock, (just to the northward of it,) vessels should not stand to the eastward of Clark's Point Light-house bearing N.

Decatur Rock, which is between three and four hundred yards to the northward of Church Rock, is another detached ledge with five feet at mean low water, and lies nearly opposite to Inez Rock, from which it bears E. by S. $\frac{1}{2}$ S., distant three-quarters of a mile, which is here the width of the channel. It is marked by a red spar-buoy (No. 8) placed in three fathoms on its southwestern side, bearing from Dumpling Rock Light-house NE. $\frac{3}{8}$ E., two miles, and from Clark's Point Light-house S. $\frac{1}{2}$ E., a little over a mile and three-quarters distant. From this buoy the black buoy on the southern end of North Ledge bears NE. $\frac{3}{4}$ E., three-eighths of a mile, and the red buoy on Bent's Ledge (in the approaches to Padanaram) NW. by W., one mile distant.

North Ledge is an extensive piece of shoal ground, nearly half a mile long in a N. and S. direction, and about three hundred yards wide between the lines of three fathoms. Near its southern end, where the shoalest water is found, it has seven feet at mean low water. A black nun-buoy* (No. 3) has been placed in three fathoms on the eastern side of this shoal as a guide to the Eastern Channel. There is no buoy on its western side, and it is not considered to be in the way of vessels bound in by the Western Channel; but to avoid it, when to the northward of Decatur Rock, vessels should not go to the eastward of Clark's Point Light-house bearing N. $\frac{3}{8}$ W., or the beacon on Egg Rock N. by E.

The black buoy on the southeastern end of North Ledge bears from

	Miles.
Decatur Rock buoy, NE. $\frac{1}{8}$ E.-----	$\frac{3}{8}$
Dumpling Rock Light-house, NE. $\frac{1}{8}$ E.-----	$2\frac{1}{4}$
Clark's Point Light-house, S. by E. $\frac{1}{4}$ E.-----	$1\frac{3}{4}$

To the northward of North Ledge the channel is clear until near Clark's Point, which should receive a berth of a quarter of a mile to the westward on account of a long shoal, with from two to five feet water, which makes in a southeasterly direction from the southern extremity of the point to a distance of two hundred and fifty yards. It is called Clark's Point Shoal, and is not buoyed, but is easily avoided by not going to the westward of Palmer's Island Light-house bearing N. $\frac{3}{4}$ W., or the beacon on Egg Rock N. by E. $\frac{3}{4}$ E.

When abreast of Clark's Point Light-house a black spar-buoy will be seen to the westward of the course and about a quarter of a mile off. This is on Old Bartlemy, a ledge with one foot water, lying an eighth of a mile from the eastern shore of Clark's Point. A reef with from **Old Bartlemy.** two to five feet upon it extends from this rock to the shore, so that there is no passage to the westward of the buoy. This buoy is marked No. 7, placed in eighteen feet water just to the eastward of the shoal of the rock, and bears from Clark's Point Light-house E. by N., distant four hundred yards. From the buoy Butler's Flats buoy bears NE. by N. $\frac{1}{8}$ N., five-eighths of a mile, and the beacon on Egg Rock NE. by N. $\frac{3}{4}$ N., seven-eighths of a mile distant.

To avoid Old Bartlemy, vessels should not stand to the westward of the beacon on Egg Rock bearing NNE. or Palmer's Island Light-house N. $\frac{3}{4}$ W.

When past the Old Bartlemy buoy a black spar will appear a little to the northward of the course, and a red spar a little to the eastward, while a conical beacon, painted white, will be seen ahead and about seven-eighths of a mile off. The beacon is on Egg Rock, the red spar on Egg Island Flats,

and the black spar on Butler's Flats, which last make off from the western side of the harbor about five-eighths of a mile to the northward of Clark's Point Light-house. **Butler's Flats.** Four feet at mean low water is found on these flats about two hundred and fifty yards from shore, and fourteen feet six hundred yards from shore and one hundred and fifty yards inside of the buoy. The buoy (marked No. 9) is placed in three fathoms three-eighths of a mile from shore, and bears from Clark's Point Light-house NE. $\frac{3}{4}$ N., three-quarters of a mile, and from Old Bartlemy buoy NE. by N. $\frac{1}{8}$ N., five-eighths of a mile distant. From the buoy Egg Rock Beacon bears NE. by N. $\frac{1}{4}$ N., six hundred and fifty yards, and Palmer's Island Light-house N. by W. $\frac{1}{2}$ W., a little over a mile and a half distant.

The red spar-buoy on the eastern side of the channel is on Egg Island Flats, that extensive area of shoal ground surrounding the Egg Islands and extending to Fort Point, and bare in places at low water,—there being no passage even for vessels of light draught between the buoy and Fort Point. The buoy (marked No. 10) is placed on the southwestern side of the flats in twelve feet water, and bears from

Egg Island Flats.

	Miles.
Clark's Point Light-house, NE. $\frac{1}{4}$ N.-----	1
The buoy on Old Bartlemy, NE. by N.----- a little over	$\frac{3}{4}$
Butler's Flats buoy, NE. by E.-----	$\frac{1}{4}$

From it the beacon on Egg Rock bears N. by W., three hundred yards, and Palmer's Island Light-house NW. by N. $\frac{1}{2}$ N., a mile and a half distant. To avoid these flats vessels should not stand to the eastward of Palmer's Island Light-house bearing N NW.

The white conical beacon just to the northward of the buoy on these flats is on Egg Rock and is known as Egg Rock Beacon. The rock is small and always out, and the beacon is a granite cone, surmounted by a spindle and vane. The beacon bears from

The northernmost of the Egg Islands, SW. by S. $\frac{1}{3}$ S.-----	$\frac{5}{8}$ mile.
Butler's Flats buoy, NE. by N. $\frac{1}{4}$ N.-----	650 yds.
Clark's Point Light-house, NE. by N.----- a little over	1 mile.

From this beacon

	Miles.
Fort Point bears N. by W. $\frac{1}{4}$ W.-----	1
Fairhaven Tower N. by W.-----	$1\frac{3}{4}$
Palmer's Island Light-house NW. by N. $\frac{1}{2}$ N.-----	$1\frac{3}{8}$
The red buoy on Fort Flat NW. by N. $\frac{1}{4}$ N.----- a little over	1

In coming in by the Western and Middle channels the course from abreast of North Ledge leads directly for this beacon until nearly up with the buoy on Butler's Flats.

Above Egg Rock Beacon the water gradually shoals, but sixteen feet can be carried up as far as Palmer's Island Light-house. On the course for this light-house there will soon appear, a little to the westward of it, two black spar-buoys nearly in range with each other. That which is nearest is on Eleven Feet Bank, a shoal making off from the western side of the harbor, and which has ten feet at low water upon it six hundred yards from shore. The buoy is marked No. 11, placed in thirteen feet off the eastern end of the bank, and bears from

Eleven Feet Bank.

	Miles.
Egg Rock Beacon, NW. $\frac{1}{2}$ N.-----	$\frac{7}{8}$
The buoy on Butler's Flats, N NW.-----	1
Clark's Point Light-house, N. $\frac{1}{4}$ E.-----	$1\frac{1}{2}$

From this buoy

Fort Point Beacon bears NE.-----	800 yds.
The earthwork on Fort Point NE. by N. $\frac{3}{4}$ N.-----	650 "
The red buoy on Fort Flat N. $\frac{1}{8}$ W.-----	$\frac{1}{4}$ mile.
Palmer's Island Light-house N. by W.----- a little over	$\frac{1}{2}$ "

To avoid Eleven Feet Bank vessels should not stand to the westward of Palmer's Island Light-house bearing N. by W. $\frac{1}{4}$ W.

The black spar-buoy an eighth of a mile to the northward of Eleven Feet Bank buoy is on the southeastern end of Palmer's Island Shoal, which extends off to the southward from Palmer's Island for a quarter of a mile, with soundings of from four to five feet and occasional groups of bare rocks. The buoy, which is one hundred and fifty yards to the eastward of Palmer's Island Shoal, is placed near a detached rock with six feet at mean low water upon it, and is marked No. 13. It bears from the buoy on Eleven Feet Bank N. by W. $\frac{1}{2}$ W., an eighth of a mile, and from Egg Rock Beacon NW. $\frac{3}{4}$ N., one mile distant. From this buoy the red buoy on Fort Flat bears N. by E. $\frac{1}{4}$ E., two hundred and fifty yards, and Palmer's Island Light-house N. $\frac{3}{8}$ W., eight hundred and fifty yards distant.

When up with the buoy on Palmer's Island Shoal a red spar-buoy will be seen nearly ahead and about an eighth of a mile off. This is on Fort Flat, a shoal with from two to five feet water, making off in a southerly and westerly direction from Fort Point for an eighth of a mile. The buoy (marked No. 12) is placed in fifteen feet at mean low water, and bears from Fort Point W. by S. $\frac{1}{2}$ S., a little over three hundred yards, and from the black buoy on Butler's Flats N. by W. $\frac{1}{2}$ W., a mile and a quarter distant. Palmer's Island Light-house bears from this buoy N. by W. $\frac{1}{4}$ W., nearly six hundred yards, and the red spar-buoy on the western side

Fort Flat.

of the northern end of Fort Flat $N. \frac{1}{4} E.$, an eighth of a mile distant. The latter is marked No. 14, placed in fifteen feet water nearly three hundred yards from shore, on the western edge of the flat, and bears from Palmer's Island Light-house $SE. \frac{1}{2} S.$, three hundred and fifty yards distant.

When up with the buoy on the western edge of Fort Flat a black spar-buoy will appear a little to the westward of the course and close in with Palmer's Island Light-house. This is on the northeastern point of the shoal surrounding Palmer's Island, and marks the western limits of the channel. It is marked No. 15, placed in sixteen feet at mean low water, and bears from the red buoy on the northwestern end of Fort Flat $NW. by N. \frac{1}{4} N.$, three hundred yards distant. Nearly abreast of it, bearing nearly $E NE.$ and distant an eighth of a mile, will be seen a red spar-buoy, marked No. 16. This is on Dix Ledge, a detached rock, with three feet, at mean low water, which lies two hundred yards from the Fairhaven shore and six hundred yards to the northward of Fort Point. The buoy is in fifteen feet, and bears from Palmer's Island Light-house $E. by N. \frac{1}{2} N.$, distant three hundred yards. When past it strangers should anchor in from three to four fathoms, on the Fairhaven side of the harbor, as there are no buoys above this point.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING NEW BEDFORD HARBOR.

I. *By the Western Channel.*—On the $NE. by E. \frac{3}{4} E.$ course through the bay, when Dumpling Rock Light-house bears $NE. by N. \frac{5}{8} N.$, three miles and three-quarters, and Cuttyhunk Light-house $S. by W. \frac{1}{8} W.$, three miles and a half distant, the depth will be fifteen fathoms, "sand and shells," and the course $NE. by N. \frac{1}{4} N.$, passing midway between the red buoy on The Sand Spit and the black buoy on Dumpling Rocks and carrying not less than four fathoms at low water. This course continued will lead, with not less than three and three-quarter fathoms, up to Clark's Point, and when that light-house bears $W. by N.$, about five-eighths of a mile distant, the depth will be four and three-quarter fathoms, and the course $N. \frac{1}{2} W.$ (with Fairhaven Tower in range with Fort Point Beacon) until nearly up with the black buoy on Butler's Flats, carrying not less than four and a half fathoms. Here the depth will be nearly twenty-seven feet, Palmer's Island Light-house will bear $N. by W. \frac{1}{4} W.$, (in range with the tallest chimney of the Wamsutta Mills,) and that course will lead, with not less than sixteen feet, past the black buoys on Eleven Feet Bank and the southern end of Palmer's Island Shoal, and up with the red buoy on the southern end of Fort Flat. When up with this buoy, $N. \frac{1}{4} W.$ will lead, with not less than sixteen feet, past Palmer's Island Light-house, and up to the anchorage on the Fairhaven shore, in from three to four fathoms water. Beyond this vessels should not attempt to go without a pilot; but it may be remarked in passing that the bearing of the tall chimney of the Wamsutta Mills ($N. by W. \frac{3}{4} W.$) will lead, with not less than ten feet water, up to the bridge. It is usual, however, for strangers to anchor on the Fairhaven shore just after passing Palmer's Island Light-house.

The above courses pass three-quarters of a mile to the westward of Wilkes' Ledge; an eighth of a mile to the westward of the red buoy on The Sand Spit; four hundred yards to the eastward of the black buoy on Dumpling Rocks; five-eighths of a mile to the westward of the red buoy on the western side of Great Ledge; nearly half a mile to the eastward of White Rock; three hundred yards to the eastward of Middle Ledge; four hundred yards to the eastward of Inez Rock; half a mile to the westward of the red buoy on Church Rock; three-eighths of a mile to the westward of the red buoy on Decatur Rock; half a mile to the westward of North Ledge; nearly five-eighths of a mile to the eastward of the red buoy on Bent's Ledge; eight hundred and fifty yards to the eastward of Clark's Point Shoal; the same distance to the eastward of the black buoy on Old Bartlemy; one hundred yards to the eastward of the black buoy on Butler's Flats; three hundred yards to the westward of the red buoy on Egg Island Flats; four hundred yards to the westward of Egg Rock Beacon; a little over one hundred yards to the eastward of the black buoy on Eleven Feet Bank; one hundred and fifty yards to the eastward of the black buoy on the southern end of Palmer's Island Shoal; thirty yards to the westward of the red buoy on Fort Flat; fifty yards to the westward of the red buoy on the northern end of Fort Flat; the same distance to the eastward of the black buoy on the northern end of Palmer's Island Shoal; and one hundred and fifty yards to the westward of the red buoy on Dix Ledge.

Or, in place of continuing the $NE. by N. \frac{1}{4} N.$ course to abreast of Clark's Point Light-house, vessels may, as soon as that light-house bears $N. \frac{1}{4} W.$ and Egg Rock Beacon $N. by E. \frac{1}{4} E.$, steer for the

latter until within about six hundred yards of it and nearly up with the black buoy on Butler's Flats. On this course there will not be less than three and a half fathoms, and Palmer's Island Light-house will bear **N. by W. $\frac{3}{4}$ W.**, which course will lead, with not less than sixteen feet, up to the red spar-buoy on the southern end of Fort Flat; after which the directions given above for the Inner Harbor must be followed.

By this course vessels pass within three hundred and fifty yards of the eastern edge of Clark's Point Shoal and the same distance to the eastward of Old Bartlemy.

DANGERS

IN APPROACHING AND ENTERING NEW BEDFORD HARBOR.

II. By the Middle Channel.—As Wilkes' Ledge lies in the middle of the approach by the Middle Channel and has equally good water and a wide passage on either side of it, it is passed on either hand by vessels entering, as circumstances may require.

Wilkes' Ledge is a detached rock with nine feet at mean low water and eight at low spring tides, and is marked by a can-buoy* of the first class, painted red and black in horizontal stripes, placed in sixteen feet on its southern side. The buoy bears from Dumpling Rock Light-house **S. $\frac{1}{2}$ E.**, one mile and three-quarters, and from Hen and Chickens Light-vessel **NE. by Wilkes' Ledge. E. $\frac{1}{4}$ E.**, six miles and an eighth distant. From it Clark's Point Light-house bears **N. by E. $\frac{3}{8}$ E.**, four and three-quarter miles, and the red buoy on the western end of The Sand Spit **N. Westerly**, one mile and an eighth distant.

To avoid Wilkes' Ledge, in beating in by this channel, vessels should not stand to the eastward of Dumpling Rock Light-house bearing **N. $\frac{1}{4}$ E.**

After passing Wilkes' Ledge there are no dangers until up with The Sand Spit, when a vessel entering the Middle Channel by this passage must be careful of her course,—not going to the westward of Clark's Point Light-house bearing **N. by E. $\frac{1}{4}$ E.**,—as the course passes within two hundred yards of the shoal. It must be remembered that the red buoy on The Sand Spit is upon its *western* end, and is a guide for the Western Channel only;—so that vessels entering the *The Sand Spit.* Middle Channel should give it a berth to the westward of not less than six hundred and fifty yards. The Sand Spit is a shoal with seven feet water upon it, about a quarter of a mile long in an **E.** and **W.** direction, and lies between the Western and Middle channels. The buoy is a red can,* of the second class, marked No. 4, and placed in sixteen feet water on its western side. From the buoy on Wilkes' Ledge this buoy bears **N. Westerly**, one mile and a quarter, and from Dumpling Rock Light-house **S. by E. $\frac{1}{8}$ E.**, half a mile distant.

When past The Sand Spit it will be necessary to look out, on the eastern side of the channel, for Great Ledge,—the two spar-buoys on which will be seen bearing about **NE. by E.**, and half a mile distant. This is a detached shoal, about four hundred and fifty yards in diameter, awash upon its shoalest part, and lies in the middle of the entrance to the Middle *Great Ledge.* Channel, with a black spar-buoy on its eastern side, near the part which is awash, and a red spar-buoy, marked No. 6, placed in three fathoms water on its western end. The red spar bears from Wilkes' Ledge buoy **NE. by N. $\frac{1}{2}$ N.**, and from Dumpling Rock Light-house **E. $\frac{3}{8}$ S.**; while from it Clark's Point Light-house bears **N. $\frac{3}{8}$ E.**, three miles and an eighth distant.

To avoid Great Ledge, vessels using this passage into the Middle Channel should not go to the eastward of Clark's Point Light-house bearing **N. by E.**

When past Great Ledge a black spar-buoy will be seen to the eastward, about three-quarters of a mile off. This is on Phinney's Rock, a small detached ledge, with eleven feet at mean low water, lying about five-eighths of a mile to the southward of Church Rock and between the Middle and Eastern channels. Vessels which have entered the Middle Channel by *Phinney's Rock.* either of the passages on the western side of Great Ledge pay no attention to it,—the courses passing over five-eighths of a mile to the westward of it;—but if standing to the eastward on a wind they should, in order to avoid it, go about as soon as Clark's Point Light-house bears **N. $\frac{1}{2}$ W.**

The black buoy on Phinney's Rock is marked No. 1 A, and placed in three fathoms water close to the eastern side of the rock.

On the western side of the channel there will be seen, when just to the northward of Great Ledge, a spar-buoy, painted red and black in horizontal stripes,—bearing about **N. by W.**, and three-quarters of a mile distant. This is on Middle Ledge, a detached ledge, about one hundred and fifty yards in diameter, with three feet at mean low water upon its shoalest part and from four to five *Middle Ledge.* fathoms on all sides of it. The buoy is placed on its southeastern side in eighteen feet water, and bears from Dumpling Rock Light-house **NE. $\frac{3}{4}$ N.**, one mile and a quarter, and from the red buoy on the western end of Great Ledge **N. by W.**, one mile and an eighth distant. The striped spar-buoy on Inez Rock bears from this buoy **NE. by N. $\frac{1}{8}$ N.**, three-eighths of a mile; the red spar-buoy on Church Rock **E. $\frac{1}{4}$ S.**, seven-eighths of a mile; and Clark's Point Light-house **N. by E. $\frac{3}{4}$ E.**, two miles and an eighth distant.

To avoid Middle Ledge, vessels coming in by this passage should not go to the westward of Clark's Point Light-house bearing **N. by E. $\frac{1}{4}$ E.**

When up with Middle Ledge the course passes midway between it and a red spar-buoy on the eastern side of the channel. This is on Church Rock, a detached ledge, with nine feet at mean low water and from three to five fathoms on all sides of it. The buoy is marked No. 6 A, is placed in three fathoms on the southwestern side of the rock, bears from Dumpling Rock Light-house **NE. by E. Easterly**, a mile and three-quarters, and from Clark's Point Light-house **S. $\frac{1}{4}$ E.**, two miles distant. To avoid it, vessels using the Middle Channel should not go to the eastward of Clark's Point Light-house bearing **N.**

On the western side of the channel, nearly opposite to Church Rock buoy, will be seen a spar-buoy, painted red and black in horizontal stripes. This is on Inez Rock, a small detached ledge, with six feet at mean low water, lying three-eighths of a mile **NE. by N. $\frac{1}{8}$ N.** from the buoy on Middle Ledge and a mile and a half **NE. by N.** from Dumpling Rock Light-house.

The buoy is placed in sixteen feet on the eastern side of the rock, close to it,—Clark's Point Light-house bearing **N. by E. $\frac{3}{8}$ E.**, a mile and three-quarters distant. The striped buoy seen about three-eighths of a mile to the westward of Inez Rock buoy is on Lone Rock; and the red spar nearly half a mile to the northward is on Bent's Ledge,—both of these rocks lying in the approaches to Apponagansett.

To avoid Inez Rock, when in its vicinity vessels should not stand to the westward of Clark's Point Light-house bearing **N. by E.**

On the eastern side of the channel, between three and four hundred yards to the northward of the buoy on Church Rock, will be seen another red spar-buoy. This is on Decatur Rock, a detached ledge, with five feet at mean low water, lying about **E. by S. $\frac{1}{2}$ S.** from Inez Rock, distant three-quarters of a mile, which is here the width of the channel. The buoy is marked No. 8, placed in three fathoms on the southwestern side of the rock, and bears from Dumpling Rock

Light-house **NE. $\frac{1}{8}$ E.**, two miles, and from Clark's Point Light-house **S. $\frac{1}{2}$ E.**, a little over a mile and three-quarters. From this buoy the black spar-buoy on the southern end of North Ledge bears **NE. $\frac{3}{4}$ E.**, three-eighths of a mile, and the red spar on Bent's Ledge (in the approaches to Padanaram) **NW. by W.**, one mile distant.

To avoid Decatur Rock, vessels should not go to the eastward of Clark's Point Light-house bearing **N.**

North Ledge is an extensive piece of shoal ground nearly half a mile long in a **N.** and **S.** direction, and about three hundred yards wide between the lines of three fathoms. Near its southern end, where it is shoalest, it has seven feet at mean low water; and a black nun-buoy* (No. 3) has

been placed in three fathoms on the eastern side of this shoal part as a guide to the Eastern Channel. There is no buoy on the western side, and to avoid the shoal vessels

bound in by the Middle Channel should not go to the eastward of Clark's Point Light-house bearing **N. $\frac{3}{8}$ W.**, or the beacon on Egg Rock **N. by E.** The buoy on the southeastern end of this ledge bears from

	Miles.
Decatur Rock buoy, NE. $\frac{1}{8}$ E. -----	$\frac{3}{4}$
Dumpling Rock Light-house, NE. $\frac{1}{8}$ E. -----	$2\frac{1}{4}$
Clark's Point Light-house, S. by E. $\frac{1}{4}$ E. ----- nearly	$1\frac{1}{2}$

North Ledge, Decatur, Church and Phinney's rocks lie in a line about **N. $\frac{1}{4}$ E.** and **S. $\frac{1}{4}$ W.** between the Middle and Eastern channels; and all the channels into New Bedford unite just to the northward of North Ledge. For description of the dangers obstructing the approach to the Inner Harbor see pages 208-210.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING NEW BEDFORD HARBOR.

II. By the Middle Channel.—1. To the Westward of Wilkes' Ledge.—When, on the **NE. by E. $\frac{3}{8}$ E.** course through Buzzard's Bay, Dumpling Rock Light-house bears **N. by E.**, two miles and seven-eighths distant, **NE. by N. $\frac{3}{4}$ N.** will lead, with not less than five fathoms, past Wilkes' Ledge, between The Sand Spit and Great Ledge, and into the Middle Channel. On this course, when Clark's Point Light-house bears **N. $\frac{3}{4}$ E.** and the beacon on Egg Rock **N. by E. $\frac{1}{2}$ E.**, the depth will be five fathoms, and the latter course should be steered for the beacon, (carrying not less than four fathoms,) past Clark's Point Shoal and Old Bartlemy, until nearly up with the black buoy on Butler's Flats and within six hundred and fifty yards of Egg Rock Beacon, when Palmer's Island Light-house will bear **N. by W. $\frac{3}{4}$ W.** and must be steered for, following the directions given for the Inner Harbor, on page 210.

The above courses pass four hundred and fifty yards to the westward of the striped buoy on Wilkes' Ledge; two hundred yards to the eastward of the eastern end of The Sand Spit, and nearly

seven hundred yards to the eastward of the red buoy on its western end; a quarter of a mile to the westward of the red buoy on the western side of Great Ledge; five-eighths of a mile to the westward of Phinney's Rock; nearly nine hundred yards to the eastward of the striped buoy on Middle Ledge; nearly seven hundred yards to the westward of the red buoy on Church Rock; eight hundred and fifty yards to the eastward of the striped buoy on Inez Rock; a quarter of a mile to the westward of the red buoy on Decatur Rock; half a mile to the westward of the black buoy on the southeastern extremity of North Ledge; four hundred yards to the eastward of the eastern edge of Clark's Point Shoal; and three hundred and fifty yards to the eastward of the black buoy on Old Bartlemy.

Sailing Directions—New Bedford Harbor.

2. *To enter the Middle Channel by passing to the Eastward of Wilkes' Ledge and to the Westward of Great Ledge.*—On the NE. by E. $\frac{3}{4}$ E. course through Buzzard's Bay, when Clark's Point Light-house bears N. $\frac{7}{8}$ E. and Dumpling Rock Light-house N. $\frac{3}{4}$ W., vessels should steer for the former, carrying not less than six and three-quarter fathoms, until abreast of the red buoy on the western end of Great Ledge, with Dumpling Rock Light-house bearing W. $\frac{3}{4}$ N.—where the depth will be seven and a half fathoms and the course N. by E. $\frac{1}{2}$ E. for the beacon on Egg Rock; which course will lead, with not less than four fathoms, past Clark's Point and nearly up with the black buoy on Butler's Flats. Palmer's Island Light-house will now bear N. by W. $\frac{3}{4}$ W. and must be steered for, following the directions given for the Inner Harbor.

The above courses pass six hundred yards to the eastward of Wilkes' Ledge buoy; three-eighths of a mile to the eastward of the eastern end of The Sand Spit; an eighth of a mile to the westward of the red buoy on the western end of Great Ledge; five-eighths of a mile to the westward of the black buoy on Phinney's Rock; nearly nine hundred yards to the eastward of Middle Ledge; about seven hundred yards to the westward of the buoy on Church Rock; eight hundred and fifty yards to the eastward of the buoy on Inez Rock; a quarter of a mile to the westward of Decatur Rock; six hundred and fifty yards to the westward of North Ledge; four hundred yards to the eastward of the eastern edge of Clark's Point Shoal; and three hundred and fifty yards to the eastward of the black buoy on Old Bartlemy.

3. *To enter the Middle Channel to the Eastward of Great Ledge.*—This is an excellent channel, and is frequently used by vessels from Vineyard Sound which have come through Quick's Hole or Wood's Hole. Vessels from the westward steering NE. by E. $\frac{3}{4}$ E. through the bay should, when Dumpling Rock Light-house bears NW. by N. $\frac{1}{4}$ N. and Clark's Point Light-house N. $\frac{1}{4}$ E., steer for the latter, carrying not less than four and a quarter fathoms, until to the northward of Church and Decatur rocks; when the depth will be four fathoms, and the beacon on Egg Rock will bear N. by E. $\frac{1}{2}$ E., and that course will lead, with not less than three and a half fathoms, nearly up with Butler's Flats buoy; after which the directions for the Inner Harbor must be followed.

The above courses pass a mile to the eastward of Wilkes' Ledge buoy; three hundred and fifty yards to the eastward of the black buoy on the eastern end of Great Ledge; six hundred yards to the westward of the black buoy on Phinney's Rock; five-eighths of a mile to the eastward of the buoy on Middle Ledge; four hundred yards to the westward of the red buoy on Church Rock; half a mile to the eastward of the buoy on Inez Rock; four hundred yards to the westward of the red buoy on Decatur Rock; and six hundred and fifty yards to the westward of the western extremity of North Ledge.

Vessels from Quick's Hole are accustomed to bring Clark's Point Light-house to bear N. and steer for it, carrying not less than four fathoms, until past North Ledge and the beacon on Egg Rock bears N. by E. $\frac{1}{2}$ E., which course leads to nearly abreast of the black buoy on Butler's Flats; after which the directions for the Inner Harbor must be followed.

These latter courses pass six hundred and fifty yards to the eastward of the black buoy on the eastern end of Great Ledge; four hundred yards to the westward of the black buoy on Phinney's Rock; three-quarters of a mile to the eastward of Middle Ledge; two hundred yards to the westward of the buoy on Church Rock; five-eighths of a mile to the eastward of the buoy on Inez Rock; two hundred and fifty yards to the westward of the buoy on Decatur Rock; and five hundred yards to the westward of the western extremity of North Ledge.

DANGERS

IN APPROACHING AND ENTERING NEW BEDFORD HARBOR.

III. *By the Eastern Channel.*—Vessels which have come from the eastern or northern part of the bay, or from Wood's Hole or Quick's Hole, generally use this channel, which passes to the eastward of Phinney's, Church, and Decatur rocks and North Ledge. On approaching the harbor by this channel the first danger met with is known as Hursell Rock, a sunken ledge, with fourteen feet at mean low water, forming the shoalest spot on an extensive mass of shoal ground known as *Negro Ledge*. The rock is small and surrounded by soundings of from three to four fathoms. It is marked by a spar-buoy painted red and black in horizontal stripes, and vessels should be careful while in its vicinity not to stand to the eastward of Sconticut Point bearing NE. by N. $\frac{1}{2}$ N., or Clark's Point Light-house N. by W. $\frac{3}{4}$ W. Hursell Rock bears from

	Miles.
Dumpling Rock Light-house, E. $\frac{1}{4}$ N.	2 $\frac{3}{8}$
Black buoy on Phinney's Rock, E. by S. $\frac{1}{4}$ S.	1
Clark's Point Light-house, S. by E. $\frac{3}{8}$ E.	3 $\frac{1}{8}$
Sconticut Point, S SW. Nearly	a little over 2

From it

	Miles.
The buoy on North Ledge bears NW. by N. $\frac{1}{4}$ N.	1 $\frac{1}{2}$
The buoy on Henrietta Rock N.	1 $\frac{3}{8}$
The buoy on Mosher Ledge NE. by N. $\frac{1}{2}$ N.	1

When abreast of Hursell Rock there will be seen, on the western side of the channel, a black spar-buoy bearing about W NW. and five-eighths of a mile distant. This is on Phinney's Rock, a small detached rock, with eleven feet at mean low water, lying about five-eighths of a mile to the southward of Church Rock and between this channel and the Middle Channel. The buoy is marked No. 1 A, placed in three fathoms water close to the eastern side of the rock, and bears from Dumpling Rock Light-house E. by N. $\frac{1}{8}$ N., one mile and three-quarters, and from Clark's Point Light-house S. $\frac{1}{8}$ E., two miles and three-quarters distant. From this buoy

	Miles.
The black buoy on North Ledge bears nearly N. by E.	1
The striped buoy on Henrietta Rock NE. $\frac{1}{2}$ N.	1 $\frac{1}{2}$
The red buoy on Mosher Ledge NE. by E. $\frac{3}{8}$ E.	1 $\frac{1}{2}$

To avoid Phinney's Rock, in coming in by the East Channel, vessels should not stand to the westward of Clark's Point Light-house bearing N. $\frac{3}{4}$ W.

After passing Phinney's Rock there are no dangers in the channel; but the eastern side is guarded by Mosher, Henrietta and Packet rocks, and the western side by Church and Decatur rocks and North Ledge. Vessels beating into the harbor by this channel will, therefore, encounter the first three when standing to the eastward, and the last three on the western board.

Mosher Ledge is a detached rock with six feet at mean low water, and surrounded by a mass of shoal ground having an average diameter of three-eighths of a mile between the lines of three fathoms. It is marked by a red spar-buoy (No. 4) placed in three fathoms about an eighth of a mile to the westward of the shoalest part of the ledge, and bearing from

	Miles.
Dumpling Rock Light-house, E. by N. $\frac{3}{8}$ N.	3 $\frac{1}{8}$
Clark's Point Light-house, SE. $\frac{3}{4}$ S.	2 $\frac{3}{8}$
The black buoy on Phinney's Rock, NE. by E. $\frac{1}{8}$ E.	1 $\frac{1}{8}$

Vessels falling in with this buoy in thick weather will notice that the black buoy on the southeastern end of North Ledge bears W. by N. $\frac{1}{2}$ N. from it, a mile and a quarter, and the striped buoy on Henrietta Rock NW. $\frac{3}{4}$ N.,—being in range with Clark's Point Light-house. Any course between these two will, therefore, lead clear of all danger to the northward of Mosher Ledge buoy, as Henrietta Rock is upon the eastern and North Ledge upon the western side of this channel.

North Ledge, whose northern end, as before mentioned, lies a mile and a quarter W. by N. $\frac{1}{2}$ N. from the buoy on Mosher Ledge and on the western side of the channel, is an extensive piece of shoal ground nearly half a mile long in a N. and S. direction, and about three hundred yards wide between the lines of three fathoms. Near its southern end, where it is shoalest, it has seven feet at mean low water, and near this spot is placed, in eighteen feet, a black nun-buoy* (No. 3), which bears from

	Miles.
Decatur Rock buoy, NE. $\frac{7}{8}$ E. -----	$\frac{3}{4}$
Dumping Rock Light-house, NE. $\frac{7}{8}$ E. -----	$2\frac{1}{4}$
Phinney's Rock buoy, N. by E. Northerly ----- a little over	1
The black buoy on the eastern side of Great Ledge, NE. by N. $\frac{1}{2}$ N. -----	$1\frac{3}{4}$

From this buoy

	Miles
The striped buoy on Henrietta Rock bears E. by N. $\frac{1}{4}$ N. -----	$\frac{3}{4}$
The red buoy on the western side of Packet Rock NE. $\frac{1}{2}$ E. ----- nearly	1
The black buoy on Butler's Flats N. $\frac{1}{8}$ E. -----	$2\frac{1}{4}$
The beacon on Egg Rock N. $\frac{1}{2}$ E. -----	$2\frac{1}{2}$
Clark's Point Light-house N. by W. $\frac{1}{4}$ W. ----- nearly	$1\frac{3}{4}$

When nearly up with North Ledge buoy the striped buoy on Henrietta Rock will be seen well to the eastward. This rock is a detached ledge, with eleven feet upon it, lying nearly one mile SW. by W. $\frac{1}{2}$ W. from Scoticut Point. There is deep water to the eastward of it, but strangers should not pass on that side of the rock, although fishing vessels and others who are acquainted with the dangers are accustomed to pass across the shoals to the eastward of this rock and between Packet Rock and Scoticut Neck. Henrietta Rock is marked by a spar-buoy painted red and black in horizontal stripes, and placed in three and a quarter fathoms on its western side, and on the following bearings: From

	Miles.
Scoticut Point, SW. by W. $\frac{1}{2}$ W. ----- nearly	1
The red buoy on Mosher Ledge, NW. $\frac{3}{4}$ N. ----- nearly	$\frac{3}{4}$
The black buoy on Phinney's Rock, NE. $\frac{1}{2}$ N. -----	$1\frac{1}{2}$
Dumpling Rock Light-house, NE. by E. $\frac{1}{4}$ E. -----	3
The black buoy on the southeastern end of North Ledge, E. by N. $\frac{1}{8}$ N. -----	$\frac{3}{4}$
Clark's Point Light-house, SE. $\frac{3}{4}$ S. ----- nearly	2

From this buoy

The red buoy to the westward of Packet Rock bears N. $\frac{1}{2}$ E. -----	850 yds.
The beacon on Egg Rock N. by W. (with the red buoy on Egg Island Flats in range) -----	$2\frac{3}{4}$ miles.
The black buoy on Butler's Flats N. by W. $\frac{1}{2}$ W. ----- a little over	$2\frac{1}{8}$ "

To avoid Henrietta Rock, vessels should not stand to the eastward of Palmer's Island Light-house bearing N. by W. $\frac{1}{4}$ W.

When abreast of Henrietta Rock there will be seen, on the eastern side of the channel and about three-quarters of a mile off, two spar-buoys—one red and one black. The westernmost, which is red and marked No. 6, is on the western side of a five feet rock, called Packet Rock Ledge, lying just to the westward of Packet Rock; while the black buoy is on the eastern side of the rock itself, and marks the western limits of the slue channel between it and Scoticut Neck. The buoy on Packet Rock Ledge is in fifteen feet at low water, and bears from

Packet Rock Ledge.

The red buoy on Mosher Ledge, NW. by N. $\frac{3}{4}$ N. -----	$1\frac{1}{8}$ miles.
The striped buoy on Henrietta Rock, N. $\frac{1}{2}$ E. -----	850 yds.
The black buoy on southeastern end of North Ledge, NE. $\frac{1}{2}$ E., a little over	$\frac{7}{8}$ mile.
Clark's Point Light-house, SE. Easterly -----	$1\frac{5}{8}$ "

From this buoy

	Miles.
The beacon on Egg Rock bears N. by W. $\frac{1}{4}$ W. -----	2
The black buoy on Butler's Flats N NW. Nearly -----	$1\frac{3}{4}$
Palmer's Island Light-house N. by W. $\frac{3}{4}$ W. -----	$3\frac{1}{4}$

To avoid Packet Rock Ledge, vessels should not stand to the eastward of Palmer's Island Light-house bearing N. by W. $\frac{3}{4}$ W.

After passing Packet Rock Ledge the Eastern Channel joins the others, and there are no dangers in the passage until up with Clark's Point,—it being only necessary, in beating, not to approach the shore of Scoticut Neck nearer than five-eighths of a mile to avoid the flats extending from it to the westward.

Clark's Point should also be given a berth of not less than six hundred yards to avoid Clark's Point Shoal, with from two to five feet water upon it, which makes in a southeasterly direction from the southern extremity of the point to a distance of two hundred and fifty yards. It is not buoyed, but is easily avoided by not going to the westward of Palmer's Island Light-house bearing N. $\frac{1}{4}$ W. or the beacon on Egg Rock N. by E. $\frac{3}{4}$ E.

Clark's Point Shoal.

When abreast of Clark's Point Light-house a black spar-buoy will be seen well to the westward, bearing about **W. by N.**, and about eight hundred yards distant. This is on Old Bartlemy, a ledge with one foot water, lying an eighth of a mile from the eastern shore of Clark's Point. A **Old Bartlemy** reef with from two to five feet upon it extends from this rock to the shore, so that there is no passage to the westward of the buoy. This buoy is marked No. 7, placed in eighteen feet water just to the eastward of the shoal of the rock, and bears from Clark's Point Light-house **E. by N.**, distant four hundred yards. From the buoy Butler's Flats buoy bears **NE. by N.**, five-eighths of a mile, and the beacon on Egg Rock **NE. by N. $\frac{3}{4}$ N.**, seven-eighths of a mile distant.

To avoid Old Bartlemy, vessels should not stand to the westward of the beacon on Egg Rock bearing **N NE.** or Palmer's Island Light-house **N. $\frac{3}{4}$ W.**

When past the Old Bartlemy buoy a black spar will appear a little to the westward of the course and a red spar a little to the eastward, with a conical beacon, painted white, just open to the westward of the latter and about three-quarters of a mile off. The beacon is on Egg Rock, the red spar on Egg

Butler's Flats. Island Flats, and the black spar on Butler's Flats, which make off from the western side of the harbor about five-eighths of a mile to the northward of Clark's Point Light-house. Four feet at mean low water is found on these flats about two hundred and fifty yards from shore, and fourteen feet six hundred yards from shore and one hundred and fifty yards inside of the buoy. The buoy (No. 9) is placed in three fathoms three-eighths of a mile from shore, and bears from Clark's Point Light-house **NE. $\frac{3}{4}$ N.**, three-quarters of a mile, and from Old Bartlemy buoy **NE. by N. $\frac{5}{8}$ N.**, five-eighths of a mile distant. From the buoy the beacon on Egg Rock bears **NE. by N. $\frac{1}{4}$ N.**, six hundred and fifty yards, and Palmer's Island Light-house **N. by W. $\frac{1}{2}$ W.**, a little over a mile and a half distant.

The red spar-buoy on the eastern side of the channel is on Egg Island Flats, that extensive area of shoal ground surrounding the Egg Islands and extending to Fort Point. They are bare in places at low water,—there being no passage even for vessels of light draught between the buoy and Fort Point. The buoy, which is marked No. 10, is placed on the southwestern side of the flats in twelve feet water, and bears from

	Mile.
Clark's Point Light-house, NE. $\frac{1}{4}$ N. -----	1
The buoy on Old Bartlemy, NE. by N. -----	a little over $\frac{3}{4}$
Butler's Flats buoy, NE. by E. -----	$\frac{1}{4}$

From this buoy the beacon on Egg Rock bears **N. by W.**, three hundred yards, and Palmer's Island Light-house **NW. by N. $\frac{1}{2}$ N.**, a mile and a half distant. To avoid these flats, therefore, vessels should not stand to the eastward of Palmer's Island Light-house bearing **NNW.**

The white conical beacon just to the northward of the buoy on Egg Island Flats is on Egg Rock, and is known as **Egg Rock Beacon**. The rock is small and always out. The beacon is a granite cone surmounted by a spindle and vane, and bears from

The northernmost (and largest) of the Egg Islands, SW. by S. $\frac{1}{2}$ S. -----	$\frac{5}{8}$ mile.
Butler's Flats buoy, NE. by N. $\frac{1}{4}$ N. -----	650 yds.
Clark's Point Light-house, NE. by N. -----	a little over 1 mile.

From this beacon

	Miles
Fort Point bears N. by W. $\frac{1}{4}$ W. -----	1
Fairhaven Tower N. by W. -----	1 $\frac{3}{4}$
Palmer's Island Light-house NW. by N. $\frac{1}{2}$ N. -----	1 $\frac{3}{8}$
The red buoy on Fort Flat NW. by N. $\frac{1}{4}$ N. -----	a little over 1

Above Egg Rock Beacon the water gradually shoals, but sixteen feet can be carried up as far as Palmer's Island Light-house. On the course for this light-house there will soon appear, a little to the westward of it, two black spar-buoys nearly in range with each other. That which is nearest is on **Eleven Feet Bank**, a shoal, with ten feet at low water upon it, making off from the western side of the harbor to a distance of six hundred yards. The buoy is marked No. 11, placed in thirteen feet off the eastern end of the bank, and bears from

	Miles.
Egg Rock Beacon, NW. $\frac{1}{2}$ N. -----	$\frac{7}{8}$
The buoy on Butler's Flats, NNW. -----	1
Clark's Point Light-house, N. $\frac{1}{4}$ E. -----	1 $\frac{1}{2}$

From this buoy

Fort Point Beacon bears NE. -----	800 yds.
The earthwork on Fort Point NE. by N. $\frac{3}{4}$ N. -----	650 "
The red buoy on Fort Flat N. $\frac{1}{2}$ W. -----	$\frac{1}{4}$ mile.
Palmer's Island Light-house N. by W. -----	a little over $\frac{1}{2}$ "

To avoid Eleven Feet Bank, vessels should not stand to the westward of Palmer's Island Light-house bearing **N.** by **W.** $\frac{1}{4}$ **W.**

The black spar-buoy an eighth of a mile to the northward of Eleven Feet Bank buoy is on the southeastern end of Palmer's Island Shoal, which extends off to the southward from Palmer's Island for a quarter of a mile, with soundings of from four to five feet and occasional groups of bare rocks. The buoy, which is one hundred and fifty yards to the eastward of the *Palmer's Island Shoal*, is placed near a detached rock with six feet at mean low water upon it, and is marked No. 13. It bears from the buoy on Eleven Feet Bank **N.** by **W.** $\frac{1}{2}$ **W.**, an eighth of a mile, and from the beacon on Egg Rock **NW.** $\frac{3}{4}$ **N.**, one mile distant. From this buoy the red buoy on Fort Flat bears **N.** by **E.** $\frac{1}{4}$ **E.**, two hundred and fifty yards, and Palmer's Island Light-house **N.** $\frac{3}{8}$ **W.**, eight hundred and fifty yards distant.

When up with this buoy a red spar-buoy will be seen nearly ahead, and about an eighth of a mile off. This is on Fort Flat, a shoal with from two to five feet water making off in a westerly direction from Fort Point for an eighth of a mile. The buoy is marked No. 12, placed in fifteen feet at mean low water, and bears from Fort Point **W.** by **S.** $\frac{1}{2}$ **S.**, a little over three hundred yards, and from the black buoy on Butler's Flats **N.** by **W.** $\frac{1}{2}$ **W.**, a mile and a quarter distant. Palmer's Island Light-house bears from this buoy **N.** by **W.** $\frac{3}{4}$ **W.**, nearly six hundred yards, and the red spar-buoy on the western side of the northern end of Fort Flat **N.** $\frac{1}{4}$ **E.**, an eighth of a mile distant. The latter buoy is marked No. 14, placed in fifteen feet water nearly three hundred yards from shore, on the western edge of the flat, and bears from Palmer's Island Light-house **SE.** $\frac{1}{2}$ **E.**, three hundred and fifty yards distant. When up with it a black spar-buoy will appear a little to the westward of the course and close in with Palmer's Island Light-house. This is on the northeastern point of the shoal surrounding Palmer's Island and marks the western limits of the channel. It is numbered 15, placed in sixteen feet at mean low water, and bears from the red buoy on the northwestern end of Fort Flat **NW.** by **N.** $\frac{1}{4}$ **N.**, three hundred yards distant.

Nearly abreast of this last-mentioned buoy (No. 15), bearing nearly **E NE.**, and an eighth of a mile off, will be seen a red spar-buoy, marked No. 16. This is on Dix Ledge, a detached rock, with three feet at mean low water, lying two hundred yards from the Fairhaven shore and six hundred yards to the northward of Fort Point. The buoy is in fifteen feet, and bears from Palmer's Island Light-house **E.** by **N.** $\frac{1}{2}$ **N.**, distant three hundred yards. When past it strangers should anchor in from three to four fathoms on the Fairhaven side of the harbor, as there are no buoys above this point.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING NEW BEDFORD HARBOR.

III. *By the Eastern Channel.* 1. *Vessels from the upper part of the Bay.*—When, on the **SW.** by **W.** $\frac{3}{4}$ **W.** course, Dumpling Rock Light-house bears **W.** $\frac{1}{4}$ **N.**, five miles distant, and Clark's Point Light-house **NW.** $\frac{1}{4}$ **W.**, a little over four miles and three-quarters distant, steer **W NW.**, carrying not less than five and a half fathoms, until Dumpling Rock Light-house bears **W.** by **S.** $\frac{1}{2}$ **S.** and Clark's Point Light-house **NW.** by **N.** $\frac{5}{8}$ **N.**; when the depth will be six fathoms and the course **N.** by **W.** $\frac{1}{4}$ **W.**, carrying not less than four and a half fathoms, until Clark's Point Light-house bears **W.** by **N.**, when Fort Point Beacon will be in range with Fairhaven Tower bearing **N.** $\frac{1}{2}$ **W.**, and that course must be steered for about seven-eighths of a mile, carrying not less than four fathoms, until nearly up with the black buoy on Butler's Flats, when Palmer's Island Light-house will bear **N.** by **W.** $\frac{3}{4}$ **W.** and should be steered for. This will lead, with not less than sixteen feet, past the black buoy on Eleven Feet Bank, the southern end of Palmer's Island Shoal, and up with the red buoy on the southern end of Fort Flat. When up with this buoy, **N.** $\frac{1}{4}$ **W.** will lead, with not less than sixteen feet, past Palmer's Island Light-house and up to the anchorage on the Fairhaven shore, in from three to four fathoms water. Beyond this vessels should not go without a pilot; but it may be remarked, in passing, that the bearing of the tall chimney of the Wamsutta Mills (**N.** by **W.** $\frac{3}{8}$ **W.**) will lead, with not less than ten feet water, up to the bridge. It is usual, however, for strangers to anchor on the Fairhaven shore just after passing Palmer's Island Light-house.

The above courses pass three-eighths of a mile to the southward and then nearly half a mile to the westward of the buoy on Mosher Ledge; nearly five-eighths of a mile to the northward of Hursell Rock; a mile to the eastward of Phinney's Rock; three hundred yards to the westward of the buoy on Henrietta Rock; a little over half a mile to the eastward of the black buoy on North Ledge; six hundred yards to the westward of the buoy on Packet Rock Ledge; nearly half a mile to the eastward of the eastern edge of Clark's Point Shoal; three-eighths of a mile to the eastward of the black buoy

Sailing Direc- on Old Bartlemy; one hundred yards to the eastward of the black buoy on Butler's
tions---New Flats; three hundred yards to the westward of the red buoy on Egg Island Flats; four
Bedford Har- hundred yards to the westward of the beacon on Egg Rock; a little over one hundred
bor. yards to the eastward of the black buoy on Eleven Feet Bank; one hundred and fifty
 yards to the eastward of the black buoy on the southern end of Palmer's Island Shoal;
 thirty yards to the westward of the red buoy on Fort Flat; fifty yards to the westward of the red buoy
 on the northern end of Fort Flat; the same distance to the eastward of the black buoy on the northern
 end of Palmer's Island Shoal; and one hundred and fifty yards to the westward of the red buoy on
 Dix Ledge.

Or, the W NW. course may be continued until Fort Point Beacon is brought in range with
 Fairhaven Tower on a bearing of $N. \frac{1}{2} W.$, when that course must be steered, keeping the range and
 carrying not less than four fathoms until nearly up with Butler's Flats buoy and Palmer's Island
 Light-house is in range with the tallest chimney of the Wamsutta Mills on a bearing of $N. \text{ by } W. \frac{3}{4}$
 $W.$; when the light-house should be steered for, following the directions given above.

These courses pass three-eighths of a mile to the southward and then three-quarters of a mile to
 the westward of the red buoy on Mosher Ledge; five-eighths of a mile to the westward of Hursell
 Rock; three-eighths of a mile to the westward of Henrietta Rock; the same distance to the eastward
 of the black buoy on North Ledge; and eight hundred and fifty yards to the westward of the red buoy
 on Packet Rock Ledge. From abreast of Clark's Point the courses and distances are the same as those
 just given for the Eastern Channel.

2. *Having come through Wood's Hole from Vineyard Sound, to enter New Bedford Harbor by
 the Eastern Channel.*—After passing the black spar-buoy on Naushon Point Shoal, (see page 148,) when
 Ned's Point Light-house is brought to bear $N. \text{ by } W. \frac{3}{4} W.$ and Bird Island Light-house $N. \frac{1}{2}$
 $E.$, Clark's Point Light-house will bear $NW.$ by $W.$, ten miles distant, and Dumpling Rock Light-
 house $W.$ by $N. \frac{1}{2} N.$, the same distance. The depth will be six fathoms, and from this position the
 course will be $W NW.$, carrying not less than five and a half fathoms, until Clark's Point Light-house
 bears $NW.$ by $N. \frac{3}{4} N.$ and Dumpling Rock Light-house $W.$ by $S. \frac{1}{2} S.$; when the depth will be five
 and a half fathoms and the course $N. \text{ by } W. \frac{1}{4} W.$, following the directions given for the Eastern
 Channel. *Or, the W NW. course may be continued* until Fort Point Beacon is in range with Fairhaven
 Tower on a bearing of $N. \frac{1}{2} W.$, when that course must be steered, keeping the range and following
 the directions previously given.

3. *Vessels which have come through Quick's Hole, and wish to enter New Bedford Harbor,*
 must, when abreast of the red buoy on Quick's Hole Ledge, steer $N. \frac{1}{4} E.$, carrying not less than five
 fathoms, until Dumpling Rock Light-house bears $NW.$ by $N. \frac{1}{2} N.$ and Clark's Point Light-house
 $N. \frac{1}{2} W.$ *Westerly*. Here the depth will be about nine fathoms and $N. \frac{1}{4} W.$ will lead up to the
 entrance to the Eastern Channel. On this course, when Dumpling Rock Light-house bears $NW. \frac{3}{4} W.$,
 two miles and five-eighths, and Clark's Point Light-house $N. \frac{3}{4} W.$, about four miles and five-eighths
 distant, the depth will be eight fathoms and the course $N. \frac{1}{2} E.$ for about two miles, passing to the
 westward of Hursell Rock, and carrying not less than five fathoms water. On this course, when Fort
 Point Beacon is in range with Fairhaven Tower on a bearing of $N. \frac{1}{2} W.$, Dumpling Rock Light-house
 will bear $W.$ by $S.$ and Clark's Point Light-house $N. \text{ by } W. \frac{3}{4} W.$; and $N. \frac{1}{2} W.$ must be steered,
 keeping the range of the beacon and tower, and following the directions given above for the Eastern
 Channel. These courses pass between five and six hundred yards to the westward of Hursell Rock;
 five-eighths of a mile to the eastward of Phinney's Rock; and a little over three-quarters of a mile to
 the westward of the red buoy on Mosher Ledge.

Or, Fort Point Beacon may be brought in range with Fairhaven Tower as soon as the range can
 be seen and steered for on a $N. \frac{1}{4} W.$ course, which will lead safely in. This course will pass a quarter
 of a mile to the westward of Hursell Rock, and between thirteen and fourteen hundred yards to the
 eastward of the black buoy on Phinney's Rock.

There is still another passage into New Bedford, called the Slue Channel,—the entrance to which
 is between West Island Ledge and Mosher Ledge,—passing to the eastward of the latter. Through
 this channel not less than fourteen feet may be taken, but it is not safe for strangers. The rule for

entering it is to bring Clark's Point Light-house to bear **NW.** and steer for it; when a red can-buoy* with a pole and bush on top will soon be seen a little to the northward of the course and about a mile off. This is on *West Island Ledge*, and marks the eastern side of the *Slue Channel into* entrance to this channel. The red spar-buoy on Mosher Ledge will be seen on the *New Bedford Harbor.* western side of the entrance; and to this a berth of not less than six hundred and fifty yards must be given, passing to the eastward of it, as it is on the western side of the rock,—the shoal of which is an eighth of a mile nearer the sailing-line than the buoy. This **NW.** course continued will cross the tail of the bank off Sconticut in not less than fourteen feet at mean low water; and when Fort Point Beacon and Fairhaven Tower are brought in range on a bearing of **N. $\frac{1}{2}$ W.**, that course must be steered, and the directions given above for the Eastern Channel must be followed.

The above courses pass an eighth of a mile to the westward of the red can-buoy on West Island Ledge; six hundred and fifty yards to the eastward of the red spar-buoy on Mosher Ledge, and four hundred yards to the eastward of the ledge itself; a quarter of a mile to the westward of Black Rock; the same distance to the eastward of Henrietta Rock; and a hundred and fifty yards to the westward of the red spar-buoy on Packet Rock Ledge.

Small vessels, whose masters are well acquainted with the dangers, or are under the charge of a good local pilot, frequently pass to the eastward of Packet Rock with thirteen feet at mean low water. To do this with safety, they steer **N.** by **W. $\frac{1}{4}$ W.** as soon as they have come abreast of Black Rock on the **NW.** course for Clark's Point Light-house. This **N.** by **W. $\frac{1}{4}$ W.** course leads across the flats with not less than thirteen feet, passes a hundred and twenty-five yards to the eastward of the black buoy on Packet Rock; and when past it, with Clark's Point Light-house bearing **NW. $\frac{1}{2}$ W.**, **NW.** by **N. $\frac{3}{4}$ N.** will lead safely up the channel, with not less than three and a half fathoms, until the beacon on Egg Rock bears **N.** by **E. $\frac{1}{2}$ E.** and Palmer's Island Light-house **N.** by **W. $\frac{3}{8}$ W.**, in range with the tallest chimney of the Wamsutta Mills. This course must now be steered, following the directions for the Inner Harbor, on page 210.

APPONAGANSETT BAY.

This bay, sometimes called **Padanaram Harbor**, lies on the western side of the Outer Harbor of New Bedford,—its entrance being about two miles to the northward of **Round Hill Point**. The name **Dartmouth Harbor** is also sometimes given to the anchorage in this bay. As before mentioned, (see page 190,) it is a narrow arm of Buzzard's Bay, a little over half a mile wide at its mouth, and gradually contracting to less than a quarter of a mile abreast of the village, where it is crossed by a bridge. Above the bridge it again expands to a width of over half a mile,—forming a broad but shallow lagoon, into the northern end of which empties the **Apponagansett River**. Good anchorage in two fathoms, soft bottom, may be found in this bay, and ten feet at mean low water may be taken through a very narrow channel as far as the lower wharves, just below the bridge. The village of **Padanaram**, or **Dartmouth**, is built on the eastern shore of the bay, nearly three-quarters of a mile above **Rickettson's Point**,—its northeastern point of entrance. Both shores are low and nearly level, and are for the most part cleared, cultivated and settled.

DANGERS

IN APPROACHING AND ENTERING APPONAGANSETT BAY.

I. By the Western Channel of New Bedford.—This harbor is entered from the Western Channel by steering to the northward (**N. $\frac{1}{2}$ E.**) as soon as Dumpling Rock Light-house bears **NW.** by **W. $\frac{1}{4}$ W.**, or, in other words, is abeam. On this course the first danger met with will be seen on the western side of the passage, above five-eighths of a mile off, and is called **White Rock**. It is a rocky islet, from ten to fifteen feet above high-water mark, lies half a mile from the western shore, and bears from

	Mile.
Dumpling Rock Light-house, N. by E. a little over	$\frac{1}{2}$
The black buoy on Dumpling Rocks, N. by E. Northerly..... nearly	$\frac{1}{4}$
The red buoy on The Sand Spit, N. by W. $\frac{1}{4}$ W.	1
The summit of Round Hill, NE. by E. nearly	$\frac{5}{8}$
From this rock	
	Miles.
Clark's Point Light-house bears NE. by N. $\frac{1}{2}$ N.	2 $\frac{7}{8}$
The black buoy on Hussey Rock N. by E. $\frac{1}{2}$ W. a little over	$\frac{1}{2}$
The striped buoy on Lone Rock NE. by N. $\frac{1}{2}$ N.	$\frac{1}{4}$
The striped buoy on Middle Ledge NE. by E. $\frac{3}{4}$ E.	$\frac{1}{4}$

About an eighth of a mile inshore of White Rock, bearing about $W. \frac{1}{2} N.$, lies a group of bare rocks, surrounded by sunken ledges with from three to four feet water upon them, and called the *Ragged Rocks*. There is a passage inside of them, through which seventeen feet at low water may be taken; but it is very unsafe. An eighth of a mile to the westward of these rocks, and a quarter of a mile $W.$ by $S.$ Southerly from White Rock, lies a sunken ledge, with five feet at mean low water, called *Fatal Rock*. None of these ledges are buoyed, and vessels to avoid them should not, when in their vicinity, stand to the westward of Dumpling Rock Light-house bearing $S SW.$ or Clark's Point Light-house $NE.$ by $N. \frac{3}{4} N.$

When past White Rock a spar-buoy, painted red and black in horizontal stripes, will be seen well to the eastward of the course and about half a mile off. This is on Middle Ledge, already described on pages 207 and 211 as a detached shoal, with three feet upon it at low tides and from four to five fathoms on all sides of it. It lies on the eastern side of the entrance to this harbor

Middle Ledge. and on the western side of the Western Channel of New Bedford. The buoy is placed on its southeastern side in eighteen feet water,—bearing from Dumpling Rock Light-house $NE. \frac{3}{4} N.$, a mile and a quarter, and from White Rock $NE. \frac{3}{4} E.$, three-quarters of a mile distant. From it Rickettson's Point bears $NW.$ by $N.$; the buoy on Lone Rock $NW.$, nearly seven hundred yards; and the black buoy on Hussey Rock $W. \frac{7}{8} N.$, five-eighths of a mile distant. To avoid it, vessels using this channel should not stand to the eastward of Rickettson's Point bearing $NW.$ by $N.$

When past White Rock there will also be seen, on the western side of the channel, opposite to the buoy on Middle Ledge and a little over half a mile off, a black spar-buoy. This is **Hussey Rock.** on Hussey Rock, which has four feet upon it and shoal water extending nearly three hundred yards to the northwestward. It is a little over half a mile from shore, and a channel three hundred and fifty yards wide, with not less than three fathoms in it, leads between the rock and the western shore. This channel is not, however, available for strangers.

The buoy on Hussey Rock is marked No. 1, placed in fifteen feet close to the rock, on its eastern side, and bears from

	Miles.
Dumpling Rock Light-house, $N. \frac{1}{2} E.$	1 $\frac{1}{2}$
White Rock, $N.$	a little over
The striped buoy on Middle Ledge, $W. \frac{7}{8} N.$	$\frac{1}{2}$

From this buoy Rickettson's Point bears $N.$ by $W. \frac{1}{2} W.$, a mile and three-eighths distant.

When between Middle Ledge and Hussey Rock a spar-buoy, painted red and black in horizontal stripes, will be seen about a quarter of a mile off and to the eastward of the course.

Lone Rock. This is on Lone Rock, a detached ledge, with two feet at mean low water, lying in the middle of the entrance to Apponagansett Bay and surrounded by deep water. The buoy is placed close to the rock, on its western side, and bears from

The black spar-buoy on Hussey Rock, $E.$ by $N. \frac{7}{8} N.$	850 yds.
White Rock, $NE.$ by $N. \frac{1}{2} N.$	a little over $\frac{3}{4}$ mile.
Dumpling Rock Light-house, $N NE.$	a little over 1 $\frac{1}{4}$ "
The striped buoy on Middle Ledge, $NW. \frac{1}{4} N.$	nearly 700 yds.

From this buoy

	Miles.
The red buoy on Bent's Ledge bears $N.$ by $E. \frac{3}{4} E.$	a little over
Rickettson's Point $NW.$ by $N.$	1 $\frac{1}{2}$
The red buoy on Dartmouth Rock $NW. \frac{3}{8} N.$	1 $\frac{1}{2}$

All the channels leading into Padanaram pass to the southward of the buoy on Lone Rock with the exception of that from New Bedford, which passes to the northward of it.

It must also be remarked that the western shore of the approach to this harbor is foul, and there are several dangerous sunken rocks lying on the eastern edge of the shoals, close to the deep water. Of these may be mentioned, first, *Lazy Rock*, which is awash at low water, lies three hundred and fifty yards from shore, and bears from

	Miles.
White Rock, $NW. \frac{3}{4} W.$	$\frac{3}{4}$
Dumpling Rock Light-house, $N NW.$	nearly 1
The black buoy on Hussey Rock, $W.$ by $S. \frac{3}{4} S.$	$\frac{1}{2}$

Second, about four hundred yards $NE.$ by $N. \frac{1}{2} N.$ from *Lazy Rock* lies another sunken rock with three feet at mean low water, and known as *Bare-kneed Rock*. It is the outermost of a group of rocks lying off this part of the shore, most of which are always out and some of them bare at low water. The sunken rock is three hundred and fifty yards from shore and bears from

	Miles.
Dumpling Rock Light-house, $N.$ by $W. \frac{1}{4} W.$	nearly 1 $\frac{1}{4}$
White Rock, $NW. \frac{3}{4} N.$	a little over
The black buoy on Hussey Rock, $W.$	$\frac{1}{2}$

An eighth of a mile **N.** by **E.** $\frac{1}{2}$ **E.** from it lies another sunken rock with four feet, known as *Keel Rock*. It is four hundred yards from shore, and bears from the black buoy on Hussey Rock **W.** by **N.** $\frac{3}{4}$ **N.**, three-eighths of a mile distant.

None of these rocks are buoyed, but they are not at all in the way of vessels entering or leaving the harbor, which should under no circumstances go inside of the buoy on Hussey Rock.

When past Lone Rock there are no dangers in the channel; but vessels must not approach the western shore nearer than three hundred and fifty yards and should use the lead freely. On approaching Rickettson's Point they should give it a berth of at least three hundred yards, as a *line of bare and sunken ledges* extends off from it to the southwestward for an eighth of a mile. The best water in the channel abreast of this point is sixteen feet.

When nearly up with Rickettson's Point, a red spar-buoy (No. 4) will be seen a little to the northward of the course and about seven hundred yards distant. This is on Dartmouth Rock, a sunken rock, with seven feet at mean low water, lying about three hundred yards from the eastern shore of the harbor and five hundred yards **NW.** by **W.** $\frac{1}{4}$ **W.** from Rickettson's Point. The buoy is placed in fifteen feet on its western side, with Dumpling Rock Light-house bearing **S.** by **E.** When past this buoy, if bound up to the village, the course turns abruptly to the northward, and anchorage may be found in from ten to eleven feet off the lower wharves.

*Dartmouth
Rock.*

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING APPONAGANSETT BAY.

I. Having come through the Western Channel of New Bedford.—On the **NE.** by **N.** $\frac{1}{4}$ **N.** course through this channel, (see page 210,) when abreast of Dumpling Rock Light-house, in seven fathoms, having it bearing **NW.** by **W.** $\frac{1}{4}$ **W.**, six hundred yards distant, the course is **N.** $\frac{1}{4}$ **E.**, carrying not less than four and a quarter fathoms, until between Middle Ledge and Hussey Rock, with Clark's Point Light-house bearing **NE.** by **N.** $\frac{1}{2}$ **N.**, when the depth will be four and a quarter fathoms, and **NW.** by **N.** **Northerly** will lead, with not less than twelve feet, to abreast of the red buoy on Dartmouth Rock. Passing a little over one hundred yards to the westward of this buoy, the course turns abruptly to **N.** $\frac{1}{2}$ **E.** nearly for the draw in the bridge. Vessels should anchor according to their draught.

The above courses pass a quarter of a mile to the eastward of Dumpling Rock Light-house; four hundred yards to the eastward of White Rock; seven hundred yards to the westward of the buoy on Middle Ledge; a quarter of a mile to the eastward of Hussey Rock; three hundred and fifty yards to the westward of Lone Rock; and a little over one hundred yards to the westward of the red buoy on Dartmouth Rock.

Having come through the Middle Channel of New Bedford to the Westward of Great Ledge, to enter Apponagansett Bay.—On the **N.** by **E.** course for Clark's Point Light-house, when Dumpling Rock Light-house bears **W.** by **S.** $\frac{1}{4}$ **S.**, nearly a mile distant, **NW.** by **N.** **Northerly** will lead safely into the harbor and up with the red buoy on Dartmouth Rock. This course passes a quarter of a mile to the westward of the buoy on Middle Ledge; half a mile to the eastward of White Rock; nearly four hundred yards to the westward of Lone Rock; and about the same distance to the eastward of the black buoy on Hussey Rock.

Having come through the Middle Channel of New Bedford to the Eastward of Great Ledge.—On the **N.** $\frac{1}{4}$ **E.** course for Clark's Point Light-house, (see page 213,) when Dumpling Rock Light-house bears **W.** $\frac{1}{4}$ **S.**, or is exactly abeam, the depth will be four and three-quarter fathoms, and the course **NW.** $\frac{1}{2}$ **N.** until past Middle Ledge and nearly between the striped buoy on Lone Rock and the black spar on Hussey Rock,—when Clark's Point Light-house will bear **NE.** by **N.** $\frac{1}{2}$ **N.**, the depth will be four and a quarter fathoms, and **NW.** by **N.** **Northerly** will lead safely into the harbor, as before.

The above courses pass three hundred and fifty yards to the westward of the buoy on Middle Ledge; a little over four hundred yards to the eastward of the black buoy on Hussey Rock; and about three hundred and fifty yards to the westward of the striped buoy on Lone Rock.

.DANGERS

IN APPROACHING AND ENTERING APPONAGANSETT BAY.

II. Having come through the Eastern Channel of New Bedford to the Westward of Hursell Rock.—Vessels which have come through this passage leave the Eastern Channel when nearly abreast

of Dumpling Rock Light-house, having it bearing **W NW**. Nearly, and steer to the northwestward nearly for the middle of the entrance to the harbor. On this course there will soon appear well to the northward, and about five-eighths of a mile off, a black spar-buoy; while to the westward of the course, and nearly half a mile off, will be seen two spar-buoys—one red and one black. The black spar-buoy on the northern side of the channel is on Phinney's Rock, while the two buoys on the southern side are on Great Ledge.

Phinney's Rock is a small detached rock, with eleven feet at mean low water and deep water all around it, lying about a mile **W**. by **N. $\frac{1}{4}$ N.** from Hursell Rock, and between the Eastern and Middle channels of New Bedford. The buoy is marked No. 1 A, placed in three fathoms

Phinney's Rock. water close to the eastern side of the rock, and bears from Dumpling Rock Light-house **E.** by **N. $\frac{3}{8}$ N.**, one mile and three-quarters, and from Clark's Point Light-house **S. $\frac{1}{2}$ E.**, two miles and three-quarters distant. From this buoy the buoy on Middle Ledge bears **NW.** by **W. $\frac{1}{4}$ W.**, a little over a mile distant, and the buoy on Hussey Rock **W NW.**, a mile and five-eighths distant.

To avoid Phinney's Rock in passing through this channel vessels should not go to the northward of the southern end of Rickettson's Point bearing **NW. $\frac{1}{4}$ N.**

Great Ledge, which lies on the southwestern side of this channel and is marked by the two spar-buoys above mentioned, is a detached shoal about four hundred and fifty yards in diameter and wash

Great Ledge. upon its shoalest part, which lies three-quarters of a mile **SW. $\frac{1}{4}$ W.** from the black buoy on Phinney's Rock. The red spar-buoy is on its western side, and the black spar-buoy is placed close to the shoalest part on its eastern side, bearing from Dumpling Rock Light-house **E. $\frac{3}{4}$ S.**, a mile and an eighth, and from Clark's Point Light-house **S. $\frac{1}{2}$ W.**, a little over three miles and an eighth distant. The channel between this buoy and the black buoy on Phinney's Rock is nearly three-quarters of a mile wide.

When past Great Ledge the course continues to the northwestward, and there will soon appear, on the northern side of the passage, a spar-buoy painted red and black in horizontal stripes. This is on Middle Ledge, before described (see pages 211 and 220) as a detached ledge about one hundred and fifty yards in diameter, with three feet at low water upon its shoalest part and from four to five fathoms on all sides of it. The buoy is placed on its southeastern side in eighteen feet water, and bears from

	Miles.
Dumpling Rock Light-house, NE. $\frac{3}{4}$ N.	1 $\frac{1}{4}$
The black buoy on the eastern side of Great Ledge, N. by W. $\frac{3}{4}$ W.	1 $\frac{1}{8}$
The black spar-buoy on Phinney's Rock, NW. by W. $\frac{1}{4}$ W.	1 $\frac{1}{8}$

When up with Middle Ledge, the black spar-buoy on Hussey Rock will be seen well to the westward, bearing about **W NW.**, half a mile distant. This rock has four feet upon it, and shoal water extending nearly three hundred yards to the northwestward. **Hussey Rock.** The buoy is marked No. 1, placed in fifteen feet close to the rock, on its eastern side, and bears from

	Miles.
Dumpling Rock Light-house, N. $\frac{1}{2}$ E.	1 $\frac{1}{8}$
White Rock, N.	a little over $\frac{1}{8}$
The striped buoy on Middle Ledge, W. $\frac{1}{8}$ N.	$\frac{5}{8}$
The buoy on Phinney's Rock, W NW.	1 $\frac{1}{8}$

From this buoy Rickettson's Point bears **N. by W. $\frac{1}{2}$ W.**, a mile and three-eighths distant.

When between Middle Ledge and Hussey Rock a spar-buoy, painted red and black in horizontal stripes, will be seen about a quarter of a mile off and to the eastward of the course. **Lone Rock.** This is on Lone Rock, a detached ledge, with two feet at mean low water, lying in the middle of the entrance to Apponagansett Bay, and surrounded by deep water. The buoy is placed close to the rock, on its western side, and bears from

The black spar-buoy on Hussey Rock, E. by N. $\frac{1}{8}$ N.	850 yds.
White Rock, NE. by N. $\frac{1}{2}$ N.	a little over $\frac{3}{4}$ mile.
Dumpling Rock Light-house, N NE.	a little over 1 $\frac{1}{4}$ "
The striped buoy on Middle Ledge, NW. $\frac{1}{4}$ N.	nearly 700 yds.

From this buoy

	Miles.
The red buoy on Bent's Ledge bears N. by E. $\frac{3}{4}$ E.	a little over $\frac{3}{4}$
Rickettson's Point NW. by N.	1 $\frac{3}{8}$
The red buoy on Dartmouth Rock NW. $\frac{3}{4}$ N.	1 $\frac{5}{8}$

All the channels leading into Padanaram pass to the southward of the buoy on Lone Rock with the exception of the passage from New Bedford, which passes to the northward of it.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING APPONAGANSETT BAY.

II. *Having come through the Eastern Channel of New Bedford to the Westward of Hursell Rock.*—On the N. $\frac{1}{2}$ E. course, (see page 218,) when Dumpling Rock Light-house bears WNW. Westerly, two miles and three-eighths distant, the depth will be eight fathoms and the course NW. $\frac{1}{2}$ N., carrying not less than four and a quarter fathoms, until past Middle Ledge and nearly up with the buoys on Lone and Hussey rocks, with Clark's Point Light-house bearing NE. by N. $\frac{1}{2}$ N. Hence the course is NW. by N. Northerly, following the directions previously given.

The above courses pass half a mile to the southwestward of the black buoy on Phinney's Rock; a little over a quarter of a mile to the northeastward of the black buoy on the eastern end of Great Ledge; three hundred and fifty yards to the southwestward of the striped buoy on Middle Ledge; four hundred and fifty yards to the eastward of the black buoy on Hussey Rock; and three hundred and fifty yards to the westward of the striped buoy on Lone Rock.

DANGERS

IN APPROACHING AND ENTERING APPONAGANSETT BAY.

III. *Having come through the Eastern Channel of New Bedford to the Northward of Hursell Rock.*—Vessels which have come through this channel and wish to enter Dartmouth Harbor leave the channel as soon as Clark's Point Light-house bears NW. by N. $\frac{3}{8}$ N. and Dumpling Rock Light-house W. by S. $\frac{1}{2}$ S., and steer to the westward; on which course there will soon appear on the northern side of the channel a red spar-buoy, and well to the southward a black spar. The former is on Church Rock, a detached ledge, with nine feet at low water, lying between the Eastern Church Rock. and Middle channels, and having soundings of from three to five fathoms on all sides of it. The buoy is marked No. 6 A, is placed on the southwestern end of the ledge in three fathoms water, and bears from the red buoy on Mosher Ledge W. Southerly, a mile and a half, and from Dumpling Rock Light-house NE. by E. Easterly, a mile and three-quarters. From it the black buoy on Phinney's Rock bears S. by E. $\frac{1}{4}$ E., distant nearly five-eighths of a mile, (which is here the width of the channel,) and the striped buoy on Middle Ledge W. $\frac{1}{4}$ S., a little over three-quarters of a mile distant.

The black spar-buoy on the southern side of the channel is on Phinney's Rock, a small detached rock, with eleven feet at low water, which lies about five-eighths of a mile to the southward of Church Rock and has deep water on all sides of it. The buoy is marked Phinney's Rock. No. 1 A, placed in three fathoms close to the eastern side of the rock, and bears from

Mosher Ledge buoy, SW. by W. $\frac{3}{8}$ W. -----	nearly	1 $\frac{1}{2}$	Miles.
Church Rock buoy, S. by E. $\frac{1}{4}$ E. -----	nearly	1 $\frac{1}{2}$	Miles.
Dumpling Rock Light-house, E. by N. $\frac{1}{4}$ N. -----		1 $\frac{1}{4}$	

From this buoy the striped buoy on Middle Ledge bears NW by W. $\frac{1}{4}$ W., nearly a mile and an eighth, and the black buoy on Hussey Rock WNW., nearly a mile and three-quarters distant.

After passing between Church and Phinney's rocks the course continues to the westward and joins the other channel (which passes to the southward of Hursell Rock) a little to the southwestward of Middle Ledge,—the striped buoy on which will soon appear a little to the northward of the course, bearing about W. by N., and distant five-eighths of a mile. The dangers are the same and are met with in the same order as when entering to the westward of Hursell Rock.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING APPONAGANSETT BAY.

III. *Having come through the Eastern Channel of New Bedford to the Northward of Hursell Rock.*—On the WNW. course between Mosher Ledge and Hursell Rock, when Dumpling Rock Light-house bears W. by S. $\frac{1}{2}$ S. and Clark's Point Light-house NW. by N. $\frac{3}{8}$ N., the depth will be six fathoms and the course W. $\frac{1}{4}$ N., carrying not less than five fathoms, until Clark's Point Light-house bears NNE. and Dumpling Rock Light-house SW. by S. $\frac{1}{4}$ S. Here the depth will be four and three-quarter fathoms, and NW. by N. Northerly will lead safely into the harbor, following the directions previously given.

The above courses pass three-eighths of a mile to the southward of the red buoy on Mosher Ledge; nearly five-eighths of a mile to the northward of Hursell Rock; eight hundred and fifty yards to the northward of Phinney's Rock; three hundred and fifty yards to the southward of the red buoy on Church Rock; and two hundred yards to the southward of the striped buoy on Middle Ledge.

DANGERS

IN APPROACHING AND ENTERING APPONAGANSETT BAY.

IV. *From New Bedford.*—Vessels from New Bedford wishing to enter this harbor take the Western Channel after passing Butler's Flats buoy, and, when a little over a mile to the southward of Clark's Point, turn to the southwestward;—on which course there will soon be seen, on the northern side of the passage, a red spar-buoy, and well to the southward a spar-buoy painted *Bent's Ledge.* red and black in horizontal stripes. The red buoy is on Bent's Ledge, a spot with four feet at mean low water, lying at the southeastern end of an extensive fifteen feet bank, forming part of the outlying shoals off Clark's Cove. The buoy is marked No. 2, placed in seventeen feet close to the rock, on its southeastern side, and bears from Clark's Point Light-house SW. by S. $\frac{1}{4}$ S., a mile and a half, and from Rickettson's Point SE. by E., a little over a mile and an eighth distant. From this buoy the striped buoy on Inez Rock bears S SE. Easterly, distant a little over nine hundred yards, which is here the width of the channel.

The striped spar-buoy on the southern side of the channel is on Inez Rock, a small detached ledge, with six feet at mean low water, lying a mile and a half NE. by N. from Dumpling *Inez Rock.* Rock Light-house and a mile and three-quarters S. by W. $\frac{3}{4}$ W. from Clark's Point Light-house. The buoy is placed in sixteen feet on the eastern side of the rock, and from it Rickettson's Point bears NW. $\frac{1}{3}$ W., about a mile and five-eighths, and the striped buoy on Lone Rock W. by S. $\frac{1}{2}$ S., three-eighths of a mile distant.

Lone Rock is well to the southward of the sailing-lines, and is, therefore, not in the way of vessels using this channel unless they are standing to the southward on a wind. It is *Lone Rock.* a detached ledge with two feet at mean low water, but surrounded by deep water, and is marked by a spar-buoy painted red and black in horizontal stripes. This buoy bears from

	Miles.
Dumpling Rock Light-house, N NE.	a little over 1 $\frac{1}{4}$
The red buoy on Bent's Ledge, S. by W. $\frac{3}{4}$ W.	a little over 1 $\frac{1}{2}$
Inez Rock, W. by S. $\frac{1}{2}$ S.	1 $\frac{1}{2}$

From this buoy Rickettson's Point bears NW. by N., a mile and three-eighths distant.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING APPONAGANSETT BAY.

IV. *From New Bedford.*—Vessels from New Bedford, when just to the southward of the black buoy on Butler's Flats, with Fort Point Beacon and Fairhaven Tower in range on a bearing of N. $\frac{1}{2}$ W., and the beacon on Egg Rock bearing N. by E. $\frac{1}{2}$ E., steer S. by W. $\frac{1}{2}$ W., carrying not less than four and a quarter fathoms, until Clark's Point Light-house bears N. $\frac{1}{4}$ W., about a mile and an eighth distant, and Dumpling Rock Light-house SW. $\frac{3}{4}$ S., two miles and a half distant; when the depth will be four and a quarter fathoms and the course SW. by W. $\frac{1}{4}$ W. for seven-eighths of a mile, carrying not less than three and three-quarter fathoms, until nearly abreast of the red spar-buoy on Bent's Ledge and Clark's Point Light-house bears NE. by N. $\frac{3}{4}$ N. Here the depth will be four and a quarter fathoms, and W. $\frac{1}{3}$ N. will lead safely to the entrance to the harbor, carrying not less than three and a quarter fathoms. On this course, when Rickettson's Point bears N. by W. $\frac{3}{4}$ W., distant a little over five-eighths of a mile, and Clark's Point Light-house NE. $\frac{1}{4}$ E., NW. by N. Northerly will lead safely into the harbor, following the directions previously given.

The above courses pass six hundred yards to the northward of Inez Rock; two hundred and fifty yards to the southward of the red buoy on Bent's Ledge; and a little over eight hundred yards to the northward of the striped buoy on Lone Rock.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING CLARK'S COVE.

I. *Vessels which have come through the Western Channel of New Bedford* should continue their course NE. by N. $\frac{1}{4}$ N. (see page 210) until Clark's Point Light-house bears N. by E., a mile and three-quarters distant, when the depth will be five and a quarter fathoms and they will have just passed Inez Rock. Now, N. $\frac{3}{4}$ W. will lead safely into the cove; where anchorage may be found in from ten to eighteen feet at mean low water. This course passes a quarter of a mile to the eastward of Inez Rock and three-eighths of a mile to the eastward of Bent's Ledge.

II. A vessel which has come through the Middle Channel of New Bedford, to the Westward of Great Ledge, when (on the N. by E. $\frac{1}{2}$ E. course for Egg Rock Beacon) Clark's Point Light-house bears N. $\frac{3}{4}$ E., must steer N. $\frac{3}{4}$ W., which will lead safely into the cove, as before.

III. A vessel coming in by the Middle Channel of New Bedford, to the Eastward of Great Ledge, must, when (on her N. $\frac{1}{2}$ E. course for Clark's Point Light-house) Dumpling Rock Light-house bears W. $\frac{1}{4}$ N. and she has just passed Great Ledge, steer N. $\frac{3}{4}$ W., which will lead safely into the cove, as before.

IV. A vessel which has come in by the Eastern Channel of New Bedford should leave the N. $\frac{1}{2}$ W. course for Fort Point Beacon (in range with Fairhaven Tower) as soon as Clark's Point Light-house bears NW. by N. $\frac{1}{4}$ N., and steer NW. by W. $\frac{1}{4}$ W. until Clark's Point Light-house bears NE. $\frac{1}{4}$ E., nearly three-quarters of a mile distant, when N. $\frac{3}{4}$ W. will lead safely into the cove, as before.

LIGHT-HOUSES.

NAME.	Latitude.	Longitude West.			Fixed or Revolving.	Height above sea-level.	Distance visible in nautical miles.
		In arc.		In time.			
	° ' "	° ' "	h. m. s.		Feet.		
Dumpling Rock Light-house	41 32 16	70 55 18	4 43 41	Fixed.	42	12	
Clark's Point Light-house	41 35 32	70 54 5	4 43 36	Fixed.	68	13	
Palmer's Island Light-house	41 37 35	70 54 33	4 43 38	Fixed.	38	12	

TIDES.

Corrected Establishment	7 ^h 57 ^m
Mean Rise and Fall of tides	3.8 ft.
Mean Rise and Fall of Spring tides	4.6 ft.
Mean Rise and Fall of Neap tides	2.8 ft.
Mean duration of Rise	6 ^h 50 ^m
Mean duration of Fall	5 ^h 33 ^m
Rise of highest tide observed	5.3 ft.

CURRENTS.

The tidal current in New Bedford is weak and does not affect the sailing courses to any extent. The following table will show the set and drift at different times of tide. The courses are magnetic, and the drift is given in fractions of a nautical mile.

LOCALITY.	First Quarter.		Last Quarter.		Flood or Ebb.
	Set.	Drift.	Set.	Drift.	
Near Dumpling Rock Light-house, (Western Channel)	NE. by N. $\frac{1}{2}$ N.	$\frac{1}{8}$	E NE.	$\frac{1}{8}$	Flood.
Abreast of Packet Rock Ledge, (Eastern Channel)	SW. $\frac{1}{2}$ S.	$\frac{1}{8}$	S. by W. $\frac{1}{2}$ W.	$\frac{1}{8}$	Ebb.
	N. by E.	$\frac{1}{8}$	E. by N.	$\frac{1}{8}$	Flood.
	SW. $\frac{1}{2}$ S.	$\frac{1}{8}$	SW. by S. $\frac{1}{2}$ S.	$\frac{1}{8}$	Ebb.

VARIATION OF THE COMPASS.

The magnetic variation at the entrance to New Bedford for 1880 is 10° 46' W.,—the approximate annual increase being 3'.

MATTAPOISET HARBOR.

This harbor lies about four miles to the northeastward of New Bedford Entrance, and is formed by a large indentation in the north shore of the bay,—running NW. and SE., and about two miles long. It is contained between the mainland on the north and Mattapoiset Neck on the south. Sixteen feet at mean low water can be taken into it through a crooked channel as far up as Ned's Point, and above this anchorage may be found in from seven to twelve feet abreast of the village. The village of Mattapoiset occupies the northern shore, at the head of the harbor, about three-quarters of a mile above Ned's Point; but it is of little importance and the harbor itself is little frequented.

Angelica Point, the northern point of entrance to Mattapoiset Harbor, is low, flat and grassy, backed by trees and faced by a line of large boulders, which, extending to the southward, look somewhat like a breakwater. When viewed from the bay a solitary house will be seen on the point; but behind this and to the northward only dense woods appear. Angelica Point.

Mattapoiset Neck, which forms the southern point of entrance, is low and thickly wooded except near the shore-line, where the surface is flat and grassy. Long ledges and outlying rocks off its southeastern side make it unsafe to approach the point nearer than a mile and a half; but on the harbor side it can be safely approached, with not less than twelve feet, to within a quarter of a mile, until past Ned's Point.

On the northern side of the harbor, a mile and a half to the northwestward of Angelica Point, will be seen a low white tower, with two white houses close to it, standing on a flat plateau with perpendicular sandy faces. This is Ned's Point Light-house, on Ned's Point, three-quarters of a mile below the village of Mattapoiset, and shows a fixed white light, of the sixth order, from a height of forty-three feet above the sea, visible eleven miles. Its geographical position is

Latitude ----- 41° 39' 1" N.
Longitude ----- 70° 47' 45" W.,

and it bears from

	Miles.
The spindle on Cormorant Rock, N. $\frac{1}{2}$ E. -----	2 $\frac{1}{2}$
The entrance to Wood's Hole, N. by W. $\frac{1}{4}$ W. -----	8 $\frac{1}{2}$
Angelica Point, NW. $\frac{1}{4}$ W. -----	1 $\frac{1}{2}$

Between Angelica and Ned's points the northern shore is comparatively low, gently sloping, with perpendicular faces, for the most part cleared near the shore-line, but backed by thick woods. Just to the northward of Angelica Point there is a small shallow cove making into the northern shore, called Pine Neck Cove, but it is of no importance. To the northward and westward of Ned's Point will be seen, on coming into the harbor, the clustered houses in Mattapoiset, having the appearance of several small settlements separated by woods and cleared lands. The main portion of the village is, however, as before mentioned, to the eastward of Ned's Point, at the head of the harbor.

The southern face of Ned's Point is protected by a stone sea-wall, which it is intended to extend along the western face also.

DANGERS

IN APPROACHING AND ENTERING MATTAPOISET HARBOR.

In approaching this harbor from the bay, if coming from the southward, vessels standing to the northward on a wind must beware of Cormorant Rock, a dangerous detached ledge lying about a mile and three-eighths to the southward of Mattapoiset Neck and dry at low water. It is marked by an iron spindle twenty-six feet high, painted black and surmounted by a cage. This spindle bears from the black can-buoy* on West Island Point NE. by N. two miles and three-eighths; and to avoid the rock vessels should not stand to the northward of the southern end of West Island bearing W SW., or Dumpling Rock Light-house W. by S. $\frac{1}{4}$ S., seen over the point of the island. From the spindle on Cormorant Rock

Cormorant Rock.

	Miles.
The spar-buoy on Nye's Ledge bears NE. by E. $\frac{1}{2}$ E. -----	1 $\frac{1}{2}$
Bird Island Light-house NE. $\frac{1}{2}$ E. -----	5
Ned's Point Light-house N. $\frac{1}{2}$ E. -----	nearly 2 $\frac{3}{4}$

Nye's Ledge is the easternmost of the ledges off Mattapoiset Neck, and the first one met with on going into the harbor. It is nearly half a mile long NW. by N. and SE. by S., and has seven feet at mean low water on its shoalest part, which bears SE. $\frac{1}{4}$ E. from the middle of the southern end of the neck, a mile and a half distant. There is a channel a quarter of a mile wide, with from three to four fathoms in it, between this ledge and Mattapoiset Ledge, to the westward; but strangers should not attempt it. Nye's Ledge is marked by a spar-buoy painted red and black in horizontal stripes and placed in fifteen feet on the southern end of the ledge. This buoy bears from

Nye's Ledge.

	Miles.
The black can-buoy on West Island Point, NE. $\frac{1}{8}$ N. -----	3 $\frac{1}{2}$
Cormorant Rock spindle, NE. by E. $\frac{1}{2}$ E. -----	1 $\frac{1}{4}$
The entrance to Wood's Hole, N. by W. $\frac{1}{4}$ W. -----	6 $\frac{1}{4}$

From the buoy

	Miles.
Bird Island Light-house bears NE. $\frac{1}{4}$ E. -----	3 $\frac{3}{4}$
Angelica Point N. by E. $\frac{1}{2}$ E. -----	1 $\frac{3}{4}$
Snow's Rock buoy NW. by N. $\frac{1}{4}$ N. -----	nearly 1 $\frac{1}{2}$
Ned's Point Light-house N. by W. $\frac{1}{4}$ W. -----	2 $\frac{1}{4}$
The black buoy on Mattapoiset Ledge NW. $\frac{3}{8}$ W. -----	a little over $\frac{1}{2}$

When abreast of Nye's Ledge buoy, on the course into the harbor, there will be seen well to the westward, bearing about NW. by W. $\frac{1}{4}$ W., and seven-eighths of a mile off, a black spar-buoy. This is on the southeastern extremity of Mattapoiset Ledge, which makes off from the southeastern point

of Mattapoiset Neck in a SE. by E. direction for nearly seven-eighths of a mile and has soundings upon it varying from five to eleven feet. The buoy is marked No. 1 and placed in three fathoms, on the southeastern extremity of the ledge, to mark the northern side of the channel between it and Nye's Ledge. It bears from the spindle on Cormorant Rock NE. by N. $\frac{3}{8}$ N., a mile and an eighth, and from the striped buoy on the southeastern end of Nye's Ledge NW. $\frac{3}{8}$ W., a little over a quarter of a mile distant. From this buoy the black buoy on Gallatin Rock bears N., about five-eighths of a mile, and Ned's Point Light-house N. $\frac{5}{8}$ W., a mile and three-quarters distant. It is usual to keep the southern side of the harbor in going in, and the buoys are placed to mark this channel; but vessels from up the bay, or from any of the harbors on the eastern shore, may come in on the northern side of the harbor, passing to the eastward of all the buoys except that on Ned's Point Shoal and the one on Landing Rock.

Mattapoiset Ledge.

In coming in by the Main Channel the first danger met with, after passing the buoy on Mattapoiset Ledge, is called Gallatin Rock. It is a small detached rock, with ten feet at mean low water and from three to four fathoms on all sides of it, lying about eight hundred and fifty yards E. $\frac{1}{8}$ S. from the middle of Gravelly Island,—(the latter being a mere collection of sand and gravel, about two hundred yards long in a N. and S. direction, and lying about three hundred yards to the eastward of the southeastern point of Mattapoiset Neck, to which it is joined at low water.) It is marked by a black spar-buoy (No. 3) placed close to the rock, on its eastern side, and bearing from the black buoy on Mattapoiset Ledge N., nearly five-eighths of a mile, and from the striped buoy on Nye's Ledge NW. by N. $\frac{1}{2}$ N., a mile and a quarter distant. From this buoy

Gallatin Rock.

The red buoy on Snow's Rock bears N NW.....	900 yds.
The black buoy on Lone Rock or Sunken Ledge NW. by W.....	$\frac{1}{2}$ mile.
Ned's Point Light-house N. by W.....	a little over $1\frac{1}{8}$ "

When up with the buoy on Gallatin Rock, Lone Rock buoy will appear on the western side of the channel; while the red buoy on Snow's Rock will appear on the eastern side, open a little to the westward of Ned's Point Light-house.

Lone Rock, sometimes called *Sunken Ledge*, is a detached rock, with four feet upon it at mean low water, lying about four hundred and fifty yards to the northward of Gravelly Island and a little over a quarter of a mile from shore. The buoy is marked No. 5, and is placed in two fathoms close to the rock, on its eastern side,—bearing from

Lone Rock.

Gallatin Rock buoy, NW. by W.....	Mile. $\frac{1}{2}$
The buoy on Mattapoiset Ledge, NW. by N. $\frac{5}{8}$ N.....	nearly 1
The northern end of Gravelly Island, N. by E. $\frac{1}{8}$ E.....	nearly $\frac{1}{4}$

From this buoy

The buoy on Snow's Rock bears NE. $\frac{5}{8}$ E.....	Miles. about $\frac{1}{4}$
Ned's Point Light-house N. $\frac{7}{8}$ E.....	$\frac{7}{8}$
The red buoy on Landing Rock N. by W. $\frac{1}{4}$ W.....	about $1\frac{1}{4}$

Snow's Rock lies on the eastern side of the Main Channel, and is marked by a red spar-buoy (No. 2) placed in fifteen feet close to the rock, on its western side. The rock has five feet at mean low water, with soundings of twelve and fifteen feet on all sides of it; and the buoy bears from the black buoy on Gallatin Rock NW. by N. $\frac{5}{8}$ N., nearly half a mile, and from the black buoy on Mattapoiset Ledge N. $\frac{5}{8}$ W., a little over a mile distant. From this buoy the striped buoy on Barstow's Rock bears N. $\frac{1}{4}$ E. Nearly, about three hundred and fifty yards, and Ned's Point Light-house N. $\frac{1}{4}$ W., three-quarters of a mile distant. To avoid this rock, therefore, (should the buoy be gone,) it is only necessary not to stand to the eastward of Ned's Point Light-house bearing N.

Snow's Rock.

Barstow's Rock, the striped buoy upon which will be seen about three hundred and fifty yards to the northward of the red spar on Snow's Rock, is also a detached rock, with seven feet at mean low water, which lies nearly in the middle of the harbor, but on the eastern side of the Main Channel. The buoy is placed on the southern side of the rock in fifteen feet, and bears from

Barstow's Rock.

The buoy on Snow's Rock, N. $\frac{1}{4}$ E. Nearly.....	350 yds.
The black buoy on Sunken Ledge, NE. by N. Northerly.....	$\frac{3}{8}$ mile.
Angelica Point, W. by N. Northerly.....	$1\frac{1}{8}$ "

From this buoy Ned's Point Light-house bears N. $\frac{1}{4}$ W., nearly five-eighths of a mile, and the red buoy on Landing Rock NW. by N. $\frac{1}{4}$ N., one mile distant. When up with it a red spar-buoy (No. 4) will be seen about half a mile to the northeastward and close in with the northern shore at Ned's Point. This is on *Ned's Point Shoal*, which makes off from that point about two hundred yards and is not at all in the way of vessels using the Main Channel.

When past Barstow's Rock there are no dangers until nearly up to the head of the harbor, when, if intending to anchor off the wharves, it is necessary to look out for Landing Rock, the red spar-buoy on which will be seen well in with the northern shore. This is a small rock, with six feet at mean low water, lying near the northern shore, (about three hundred yards from it)—bearing from the buoy on Ned's Point Shoal about **NW. $\frac{1}{2}$ W.**, three-quarters of a mile distant. The buoy (No. 6) is in two fathoms on the southwestern side of the rock,—the end of the long wharf in Mattapoiset bearing **NW. by W.**

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING MATTAPOISET HARBOR.

I. From the Westward, by the Main Channel.—On the course **NE. by E. $\frac{3}{4}$ E.** through the bay, when Wing's Neck Light-house bears **NE. $\frac{3}{4}$ E.**, eight miles and three-quarters, and Bird Island Light-house **NE. $\frac{3}{4}$ N.**, six miles and three-quarters distant, the latter course should be steered, carrying not less than six fathoms, until Ned's Point Light-house bears **NW. by N. $\frac{3}{4}$ N.**, three miles distant. The depth here will be six and a quarter fathoms and the course **NW. by N. $\frac{3}{4}$ N.** for the light-house, carrying not less than three and three-quarter fathoms, until Bird Island Light-house bears **NE. by E. $\frac{1}{4}$ E.**, seen just clear of Angelica Point. Hence the course is **NW. $\frac{1}{4}$ W.**, carrying not less than seventeen feet for about a mile and an eighth, until past Sunken Ledge, Snow's Rock and Barstow's Rock, and Ned's Point Light-house bears **N NE.**, a little over five-eighths of a mile distant. Here the depth will be seventeen feet, soft bottom, and the course **N. by W. $\frac{3}{4}$ W.**, which will lead safely to the head of the harbor.

The above courses pass a little over four hundred yards to the eastward of the striped buoy on Nye's Ledge; about half a mile to the northeastward of the black buoy on Mattapoiset Ledge; two hundred yards to the northward of the black buoy on Gallatin Rock; one hundred and fifty yards to the southward of the red buoy on Snow's Rock; three hundred yards to the northward of the black buoy on Lone Rock; and six hundred yards to the westward of the striped buoy on Barstow's Rock.

II. Coming from the Head of the Bay or from the Harbors on the Eastern Shore, to enter by the Main Channel.—**1. Vessels from Wareham or Cohasset Narrows** bound into Mattapoiset, when, on their **SW.** course through the bay, they come abreast of Bird Island Light-house, having it bearing **NW.**, seven-eighths of a mile distant, steer **SW. by W.**, carrying not less than three and three-quarter fathoms, until Ned's Point Light-house is just on with the extreme southwestern end of Angelica Point on a bearing of **NW. $\frac{3}{4}$ W.** Here the depth will be four and three-quarter fathoms and the course **W. $\frac{1}{4}$ N.** for Mattapoiset Neck until Ned's Point Light-house bears **NW. by N. $\frac{3}{4}$ N.**; when the depth will be three and three-quarter fathoms and the course **NW. $\frac{1}{4}$ W.**, following the directions given above for this channel.

2. A vessel from Pocasset should, when clear of the red buoy on Southwest Ledge, bring Wing's Neck Light-house to bear **NE. by E. $\frac{1}{2}$ E.** and steer **SW. by W. $\frac{1}{2}$ W.**, carrying not less than three and a half fathoms, until Bird Island Light-house bears **NE. $\frac{3}{4}$ N.** and Ned's Point Light-house is just on with the southwestern end of Angelica Point on a bearing of **NW. $\frac{3}{4}$ W.**; when the depth will be four and three-quarter fathoms and the course **W. $\frac{1}{4}$ N.**, as before, following the directions given above.

3. A vessel from Cataumet should steer **W. $\frac{3}{4}$ S.** from the middle of the entrance, carrying not less than three and three-quarter fathoms, until Bird Island Light-house bears **NE. $\frac{3}{4}$ N.** and Ned's Point Light-house is on with Angelica Point, as before; when **W. $\frac{1}{4}$ N.** must be steered, following the directions previously given.

4. A vessel from Hog Island Harbor should, when clear of the entrance, steer **NW. by W. $\frac{1}{4}$ W.** carrying not less than three and a quarter fathoms, until Bird Island Light-house bears **NE. by E. $\frac{1}{4}$ E.** and Ned's Point Light-house **NW. by N. $\frac{3}{4}$ N.**; when the depth will be three and three-quarter fathoms and **NW. $\frac{1}{4}$ W.** will lead into the harbor, following the directions previously given.

III. To enter by the North Channel.—This channel is not recommended to strangers. Vessels from Wareham, Cohasset Narrows, or the eastern side of the bay, when, on their courses for the entrance, Bird Island Light-house bears **NE. $\frac{3}{4}$ N.** and Ned's Point Light-house **NW. $\frac{3}{4}$ W.**, (in range with the southwestern end of Angelica Point, as before,) steer **NW. by W. $\frac{1}{4}$ W.**, carrying not less than fourteen feet, which course will lead straight into the harbor, passing to the northward of all the dangers except Randall's Rock and the shoal off Ned's Point.

Randall's Rock is a detached ledge, with seven feet at low water and from eighteen to twenty feet on all sides of it, which lies nearly seven-eighths of a mile SE. from Ned's Point Light-house and between five and six hundred yards from the eastern shore. To avoid it, when in its vicinity, vessels should not go to the eastward of Ned's Point Light-house bearing NW. $\frac{1}{2}$ N. If this rock were buoyed the North Channel would be as safe as the Main.

When past *Randall's Rock* the red buoy on *Ned's Point Shoal* will be seen on the northern side of the channel and the striped spar-buoy on *Barstow's Rock* on the southern side. These two mark the limits of the North Channel, which is here eight hundred yards wide; and the course passes nearly midway between them. Anchorage may be found anywhere to the westward of the light-house.

The course into the North Channel crosses the shoal off the western side of *Angelica Point*, about three hundred and fifty yards from shore, in about fourteen feet water; passes two hundred yards to the southward of *Randall's Rock*; about four hundred yards to the southward of the red buoy on *Ned's Point Shoal*; and a little over three hundred yards to the northward of the striped buoy on *Barstow's Rock*.

LIGHT-HOUSE.

NAME.	Latitude.	Longitude West.			Fixed or Revolving.	Height above sea-level.	Distance visible in nautical miles.
		In arc.	In time.				
	° ' "	° ' "	h. m. s.		Feet.		
Ned's Point Light-house	41 39 1	70 47 45	4 43 11	Fixed.	43	11	

TIDES.

For Tides see tidal data of New Bedford Harbor, page 225.

VARIATION OF THE COMPASS.

The magnetic variation at the entrance to Mattapoiset for 1876 was 10° 35' W., with an approximate annual increase of 2 $\frac{1}{4}$ '. This gives, for 1880, variation 10° 45' W.

SIPPICAN HARBOR.

The entrance to this harbor is about two miles to the northeastward of Mattapoiset Entrance and is marked by *Bird Island Light-house*. The harbor is a long and narrow cove indenting the northwestern shores of the bay, and runs in a NNW. direction for two miles and three-quarters, between *Sippican Neck* on the east and *Charles' Neck* on the west. At its mouth it is a mile and an eighth wide, but gradually contracts on approaching the head of the harbor, where the width is a little over half a mile. The small village of *Sippican* is situated upon its western shore, about half a mile below its head; and nine feet at mean low water may be taken up as far as its long wharf; but the channel is narrow and crooked.

The most noticeable object on approaching *Sippican Harbor* is *Bird Island Light-house*, which will appear as a white tower rising from the middle of a group of white houses nearly half a mile to the southward of the extremity of *Sippican Neck*. It is built upon *Bird Island*,—a round, low and perfectly flat islet, entirely bare of trees, and faced by a stone sea-wall. The light-house, which is built near its southern end, is attached to the corner of a white dwelling, and shows a fixed light (varied by white flashes at intervals of a minute and a half) from a height of thirty-seven feet above the sea, visible eleven miles. The geographical position of this light-house is

Bird Island Light-house.

Latitude 41° 40' 8" N.
Longitude 70° 43' 3" W.,

and it bears from

	Miles.
The spindle on <i>Cormorant Rock</i> , NE. $\frac{1}{2}$ E.	5
The entrance to <i>Wood's Hole</i> , N. $\frac{1}{2}$ E.	8 $\frac{1}{2}$
<i>Wing's Neck Light-house</i> , W. $\frac{1}{2}$ S.	2 $\frac{1}{2}$

There is no safe passage to the northward of *Bird Island*,—the space between it and the neck being occupied by dangerous sunken ledges. On the northern end of the island will be seen a red boat-house.

Sippican Neck, which forms the eastern side of the harbor, is for the most part cleared, but backed by thick woods,—the whole of the northern and eastern part of the neck being densely wooded. *Sippican Point*, its southern extremity, is low, flat and grassy, faced by boulders, and bare of trees except for a clump of low bushes and scrubby trees a little to the northward of its extremity. The thick woods begin about half a mile to the northward of the point, and just on their southern edge will be seen a group of houses surrounded by cleared fields. The western face of the neck, from the point where the woods begin to *Planting Island*, a little over three-eighths of a mile above, is faced by a nearly perpendicular sand cliff, which is remarkable as being the only one in the harbor.

Sippican Neck.

Charles' Neck, which forms the western point of entrance to Sippican, when viewed from the southward shows as a low, flat, grassy point with somewhat steep faces, and backed by dense woods. Its southern and eastern faces are thickly strewn with innumerable boulders and bare ledges, which in some cases extend nearly four hundred yards from the shore. The general name **Seal Rocks** is given to these, and they extend from the southern point of the neck to Steward's Island, a mile above.

Planting Island, on the eastern shore, a mile and an eighth above Sippican Point, is not in reality an island, but a long narrow neck of land lying **NW.** by **N.** and **SE.** by **S.**, and joined to the main shore by a low narrow strip of sand, covered only with grass. The island is rocky, of moderate height, half a mile long, and has an average width of a little over two hundred yards. At its southern end it is somewhat steep, and its top is covered with scubby bushes; but the rest of the island is more level, bare of all but a scanty growth of grass, and terminates at its northern end in a low point backed by salt meadow.

Behind Planting Island (between it and Sippican Neck) there makes in a long, narrow and shallow cove, called **Blankenship's Cove**. It runs about **SE.** by **S.** for a little over half a mile, and five feet at mean low water may be taken into its mouth through a very narrow and crooked channel; but above this it is a mass of flats and is of no importance.

About a hundred yards from the northern end of Planting Island lies **Meadow Island**, a marshy island of irregular shape and about two hundred and fifty yards in diameter. There is no passage between it and Planting Island,—the space between them being filled with a mass of rocks and boulders, all of which are out at low water.

Ram Island, a hundred and seventy-five yards to the westward of Meadow Island, lies nearly **E.** and **W.**, and is a little over four hundred yards long. Its western end is only about three hundred and fifty yards from Nye's Wharf on the western side of the harbor,—the channel passing between them. Ram Island is low, flat and sandy, covered near its southwestern end with a thick growth of various kinds of trees; while the northern half has only a few low scrubby spruce. A single large bushy spruce tree, standing near the northern end, forms a prominent mark.

On the western side of the harbor, a little over a mile above the southern extremity of Charles' Neck, lies Steward's Island, low, flat and marshy, and has a thick clump of low trees in the middle. It is about a quarter of a mile long in a **NNW.** and **SSE.** direction, and lies close in with the shore, with which it is connected at low water. The marsh land, which begins about three-eighths of a mile below this island and extends about an eighth of a mile above it, is backed by cleared fields interspersed with clumps of woods. Here begin the cleared and cultivated lands which surround the village of Sippican and extend to the head of the harbor.

Nye's Wharf, about a third of a mile above Steward's Island, is the southernmost wharf in the village, and extends about sixty yards from shore. Between it and the island the land is low and nearly level, but has a barren appearance,—bare ledges cropping out all over the surface, and the shore being faced with innumerable boulders. There are several houses near Nye's Wharf, and the main settlement will be seen about three-eighths of a mile above.

Above Ram Island both shores of the harbor are gently sloping, of moderate height, cleared, cultivated, and backed by thick woods.

DANGERS

IN APPROACHING AND ENTERING SIPPICAN HARBOR.

In approaching this harbor on the northerly course, the first danger met with is a detached ledge a mile and a quarter **S. ¼ W.** from the southern end of Charles' Neck, and called **The Bow Bells**. Bow Bells. It is three-quarters of a mile **E. by S.** from Pease's Point, (which is three quarters of a mile to the northward of Angelica Point,) and is composed of four sunken rocks,—three having twelve feet at low water and the southernmost ten and a half feet. A black spar-buoy, marked No. 11, is placed in nineteen feet just to the eastward of the southernmost rock, and bears from the striped buoy on Nye's Ledge (off Mattapoiset) **NE. ¼ N.**, two miles and three-eighths distant. From this buoy

	Miles.
Bird Island Light-house bears NE. by E.	nearly 1 ½
The black buoy off the Seal Rocks, on the eastern side of Charles' Neck, N. ¼ E.	nearly 1 ¾
Mendell Rocks N. by E.	1 ¾
The southern extremity of Charles' Neck N. Easterly	nearly 1 ¼

The sailing-line passes nearly half a mile to the eastward of this buoy.

On the eastern side of the channel it is necessary to look out for **Centre-board Shoal**, a rock with twelve feet water, lying half a mile **SW. ¾ W.** from Bird Island Light-house and a little over a mile **SE. ¼ E.** from the southern extremity of Charles' Neck. It has from seventeen to nineteen feet on all sides of it and is not buoyed; but vessels should not approach Bird Island on its western side nearer than five-eighths of a mile, by which means they will avoid not only this shoal, but also the numerous ledges and sunken rocks which lie to the southward and westward of Bird Island. Of these latter rocks may be mentioned, first, **Blank Rock**, lying about two hundred and fifty yards **S.** from the light-house, with six feet water;

Eight Feet Rock, a quarter of a mile SW. $\frac{1}{2}$ W. from the light-house; and *Northwest Ledge*, an extensive mass of rocks, with from seven to thirteen feet, extending NW. by N. and SE. by S. for an eighth of a mile, and lying between the bearings W. by S. and W. by N. $\frac{1}{2}$ N. from the light-house. The shoal of this ledge is about four hundred and fifty yards W. $\frac{1}{2}$ N. from the light-house.

When to the northward of Bird Island, the next danger met with lies to the eastward of the southern end of Charles' Neck and on the western side of the channel. This is known as Mendell Rocks, two sunken rocks with eight and nine feet water upon them, which lie a quarter of a mile ENE. from the southern extremity of Charles' Neck and a little over a mile *Mendell Rocks*. NW. by W. $\frac{1}{2}$ W. from Bird Island Light-house. From the black buoy on The Bow Bells they bear N. by E., a mile and three-eighths distant, and from them the black buoy off Seal Rocks bears N., six hundred and fifty yards distant. They are not buoyed, and vessels to avoid them should not go to the westward of the western end of Ram Island bearing N. $\frac{3}{4}$ W.

When abreast of the southern end of Charles' Neck the black spar-buoy (No. 1) on Seal Rocks will be seen nearly ahead and about half a mile off. This is the general name given to that immense mass of boulders, ledges and dry rocks which extends along the eastern face of Charles' Neck from its southern extremity to Steward's Island, a distance of over a mile. Shoal *Seal Rocks*. water is found all along the eastern side of these rocks at an average distance of four hundred and fifty yards from shore, and it is not safe, therefore, to approach the eastern side of Charles' Neck nearer than a quarter of a mile. The black buoy on these rocks bears from

Bird Island Light-house, NW. $\frac{1}{2}$ W.-----	1 $\frac{1}{2}$ miles.
Mendell Rocks, N.-----	650 yds.
The black buoy on The Bow Bells, N. $\frac{3}{4}$ E.-----	a little over 1 $\frac{1}{2}$ miles.

When past it there are no dangers in the channel; but vessels drawing over eight feet should not approach Planting Island nearer than six hundred yards, as the flats make off from that shore for about a quarter of a mile.

A little over three hundred yards W. $\frac{1}{2}$ S. from the middle of Meadow Island lie two detached rocks awash at low water and bare at extreme low tides. They lie NW. and SE. from each other, six hundred yards apart,—the northernmost being known as *The Pulpit* and the other as *The Deacon's Seat*. Neither is buoyed, but they are not in the way, as vessels should not go to the eastward of the western end of Ram Island bearing N. by W. $\frac{3}{4}$ W.

On the western side of the channel, a little above these rocks, and about one hundred and twenty yards to the southeastward of Nye's Wharf, will be seen another black spar-buoy, marked No. 3. This is on Black Rock, a detached rock, with four feet upon it, lying nearly a hundred yards from shore. The buoy is placed in twelve feet about thirty yards from the rock, and bears from Bird Island Light-house NW. by N. and from the black buoy off Seal Rocks N. by *Black Rock*. W. $\frac{1}{2}$ W. From the buoy the end of Nye's Wharf bears NW. by N. Northerly, distant a hundred and twenty yards, and the red buoy on Ram Island Shoal N. $\frac{1}{4}$ W., two hundred yards distant. Strangers should anchor to the southward of Black Rock, where good shelter is found in from ten to twenty-one feet, except in southeasterly gales.

Vessels bound up to the village should here take a pilot, as above Black Rock the dangers are numerous,—many of them are not buoyed, the channel is narrow, and the currents strong. Of these dangers the first met with, after passing Black Rock, is Ram Island *Ram Island Shoal*. Shoal, which makes off from that island to the westward for a little over two hundred yards with from three to four feet upon it. Off its western end, in ten feet at mean low water, is placed a red spar-buoy (No. 2), marking the eastern limits of the channel.

About one hundred and twenty yards to the northwestward of Ram Island Shoal buoy, and a hundred and seventy-five yards above Nye's Wharf, lies a detached rock, with six feet *Berry Rock*. at mean low water, called Berry Rock. It is seventy-five yards from the western shore and is not buoyed, but the sailing-line passes to the eastward of it.

An eighth of a mile to the northward of Berry Rock, and about sixty yards to the northward of the northeastern end of Little Island, lies another sunken rock with six feet at mean low water, and one hundred and seventy-five yards from the Sippican shore. It is not buoyed, but the sailing-lines pass to the eastward of it.

On the eastern side of the channel, about one hundred and sixty yards to the northeastward of the last-mentioned rock, and between five and six hundred yards above Nye's Wharf, lies *Volant Rock*. Volant Rock, with nine feet at mean low water. The courses pass to the westward of it, but it is not dangerous, as nine feet is the best water that can be taken above Little Island.

When up with Little Island a black spar-buoy will be seen to the westward of the course and a little over three hundred yards off. This is on Gull Rock, awash at low water, lying about a hundred and thirty yards from the Sippican shore and the same distance SE. *Gull Rock*. from the end of the long wharf in the village. The buoy is marked No. 5, and placed in seven feet just to the northeastward of the rock.

About two hundred and seventy-five yards N. by W. $\frac{1}{2}$ W. from the buoy on Gull Rock, and nearly two hundred yards N. $\frac{1}{2}$ E. from the end of the long wharf in the village, will be seen another black spar-buoy (No. 7). This is on Lucas' Ledge, a sunken rock, with four feet, lying *Lucas' Ledge.* an eighth of a mile from shore and a hundred and seventy-five yards E. $\frac{1}{4}$ N. from the end of Lucas' Wharf. The buoy is placed close to the rock, on its eastern side, and marks the western limits of the channel, which is here not quite one hundred yards wide,—there being *another sunken rock, with four and a half feet, on its eastern side,* one hundred yards E. $\frac{1}{2}$ N. from the buoy on Lucas' Ledge.

Another four feet rock lies nearly midway between the eastern and western shores of the harbor, a hundred and sixty yards to the northward of the "four and a half feet rock," and a little over two hundred yards NE. by E. $\frac{1}{2}$ E. from the end of Lucas' Wharf. When past it there are no more rocks in the passage until within three hundred and fifty yards of Delano's Wharf, at the

Rescue Rock. head of the harbor, where there lies, exactly in the middle of the passage,—bearing from the end of Delano's Wharf SE. by S. $\frac{1}{2}$ S., nearly three hundred yards distant,—a small detached rock, with two feet at mean low water, called Rescue Rock; and an eighth of a mile to the northward of this, and about a hundred and twenty yards to the eastward of the end of Delano's Wharf, lies another, bare at low water, called *Bush Rock.* These are all the dangers in the harbor.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING SIPPICAN HARBOR.

On the NE. course towards the head of the bay, when Bird Island Light-house bears N. by E. $\frac{3}{8}$ E., two miles, and Wing's Neck Light-house NE. by E., three miles and seven-eighths distant, the depth will be five and a half fathoms and the course N. $\frac{1}{2}$ W., which will lead up to the black buoy off Seal Rocks with not less than thirteen feet. Passing about one hundred yards to the eastward of this buoy, in sixteen feet water, N. by W. $\frac{3}{4}$ W. will lead, with not less than thirteen feet, to the buoy on Black Rock. But vessels should anchor to the southward of that buoy, about a third of a mile above the northern end of Seal Rocks. Or, if bound up to the village, a pilot must be obtained at Nye's Wharf.

The above courses pass nearly half a mile to the eastward of the black buoy on The Bow Bells; three-eighths of a mile to the westward of Centre-board Shoal; one hundred and fifty yards to the eastward of Mendell Rocks; one hundred yards to the eastward of the black buoy off Seal Rocks; and a little over four hundred yards to the westward of The Pulpit and The Deacon's Seat.

At night, the N. $\frac{1}{2}$ W. course should be steered until Bird Island Light-house bears SE. $\frac{1}{4}$ E. when N. by W. $\frac{3}{4}$ W. will lead to the anchorage as before.

Thirteen feet at mean low water may be taken up to Black Rock buoy; but not over nine feet can be taken up to the village, and about four feet up to Delano's Wharf.

LIGHT-HOUSE.

NAME.	Latitude.	Longitude West.		Fixed or Revolving.	Interval of Flash.	Height above sea-level.	Distance visible in nautical miles.
		In arc.	In time.				
Bird Island Light-house	41 40 8	70 43 3	4 42 52	F. V. F.	m. s. 1 30	Feet. 37	11

TIDES.

Corrected Establishment	7 ^h 59 ^m
Mean Rise and Fall of tides	4.4 ft.
Mean Rise and Fall of Spring tides	5.3 ft.
Mean Rise and Fall of Neap tides	3.5 ft.
Mean duration of Rise	5 ^h 14 ^m
Mean duration of Fall	7 ^h 10 ^m
Rise of highest tide observed	6.2 ft.

VARIATION OF THE COMPASS.

The magnetic variation at the entrance to Sippican Harbor was, for 1876, 10° 40' W., with an approximate annual increase of 2 $\frac{1}{2}$ '. This gives, for 1880, variation 10° 50' W.

WAREHAM RIVER.

This river empties into the northwestern corner of Buzzard's Bay, between Warren Point on the east and Nobska Point (the northeastern point of Cromeset Neck) on the west, and runs through a narrow and crooked channel for nearly three miles to the village of Wareham, on its western bank. For upwards of one-third of this distance the channel at low water is a mere creek. The depth, however, has been increased, and the channel widened, by the United States Engineers, so that there is now a depth of nine feet at mean low water through a channel one hundred feet wide as far up as Quohog Bar; and six feet at mean low water may be taken up to the wharves. The numerous ledges and flats which obstruct the channel are well buoyed; but owing to its contracted limits, winding course, and the strength of the current, strangers should not enter it however light their draught.

The western point of entrance to Wareham River is called Nobska Point, and is the northeastern extremity of **Cromeset Neck**, which separates this river from **Weweantic River** to the westward. (See page 192.) Nobska Point is flat, with sandy faces, has a scattered growth of trees upon it and a number of large boulders upon its extremity. On its northern side makes in **Mark's Cove**, a shallow indentation of no importance, which has been partially filled up by the sand and mud dug from the channel of the river by the dredge boats. Warren Point, the eastern point of entrance to the river, is low, flat and sandy, bare of trees near its western end, but carrying a thick grove about a quarter of a mile back from the river. From it, at low water, a sand-spit extends to a low sandy islet, destitute of all vegetation; and about fifty yards to the westward of this there is another, which when viewed from the mouth of the river appears as a low sandy point covered with a dense growth of scrub. This is called **Long Beach Point**, and the spit connecting it with the mainland is called **Long Beach**. This point is quite bold-to.

**Nobska and
Warren Points.**

On the western bank of the river, above Mark's Cove, the shore has a general course **NE.** by **E.** $\frac{1}{2}$ **E.** for a little over three-quarters of a mile to **Swift's Neck**. This part of the shore is low, flat and sandy, for the most part cleared and covered with a thin growth of grass, but showing occasional clumps of trees separating the cleared fields. Near the river bank it is mostly marsh. **Swift's Neck** itself is low and sandy, and has a thick growth of low bushy trees on top. It extends off into a long, low, flat and marshy point, called **Quisset Point**, off which there was, in 1874, a stake surmounted by a barrel, which was used as a range mark in coming up the river.

Swift's Neck.

On the eastern bank the shore runs about **NNE.** from Warren Point to the entrance to **Crooked River**, five-eighths of a mile above. This is a shallow stream, of no importance, making into the eastern shore for about five-eighths of a mile, beyond which it is a mere brook. On its northern side, and nearly opposite to **Swift's Neck**, lies **Barney's Point**. **Barney's Point**, low, sandy, fringed with grass, and covered with low trees and bushes. The river is here but two hundred and fifty yards wide; but above **Barney's Point** it rapidly widens and spreads into a broad, shallow bay, between six and seven hundred yards wide, through which winds the narrow channel leading up to Wareham. Above **Barney's Point** the eastern shore is for the most part thickly wooded.

On the western bank, opposite to **Barney's Point**, makes in **Johnson's Creek**, on the northern side of **Swift's Neck**. It has a general direction about **NNW.**, is shallow and of very unequal width,—being only one hundred yards wide at its mouth, but spreading out into shallow bays, some of which are a quarter of a mile in width, connected by narrow passages not over one hundred yards wide.

The northern side of **Johnson's Creek** is formed by **Wareham Neck**, the site of the village of Wareham. At its southern end, locally known as **End of Neck**, it shows low sandy land, thickly covered with low trees and bushes; but when up with this point the eastern face of the neck will be seen thickly dotted with houses, prominent among which a large but low factory, with steep roof, will appear. This is the **Steel Works**; and a large wharf, surmounted by a derrick, is built out from the shore close to it.

Wareham Neck.

The principal business at **Wareham** is the manufacture of nails and of iron and steel. In the present improved condition of the channel not less than twelve and a half feet can be taken up to abreast of the wharves at ordinary high water. Abreast of the village the river is scarcely one hundred yards wide, and is crossed by a bridge carrying the Old Colony Railroad.

DANGERS

IN APPROACHING AND ENTERING WAREHAM RIVER.

As strangers cannot enter this river or pass beyond **Great Hill Point** without a pilot, owing to the tortuous character of the channel and the many ledges and shoals which obstruct it, it is not deemed necessary to give more than a cursory description of the dangers above that point. In approaching the river, when nearly up with **Bird Island Light-house** a black spar-buoy will be seen about three-eighths of a mile to the eastward of the light. This is **Bird Island Reef**, which has from four to six feet at mean low water and forms part of the shoal ground making off from **Sippican Neck** in a **SSE.** direction for half a mile. The buoy is marked **No. 13**, placed in three fathoms on the eastern edge of the shoal, and is near from **Bird Island Light-house E. $\frac{1}{4}$ S.**, three-eighths of a mile, and from **Wing's Neck Light-house W. $\frac{1}{2}$ S.**, nearly two miles and a quarter distant. To avoid this shoal vessels should give the light-house a berth to the westward of not less than three-quarters of a mile.

**Bird Island
Reef.**

When past Bird Island Reef, and heading up toward Great Hill, a black spar-buoy will soon be seen close in with the hill and off the mouth of Wing's Cove. This is on Wing's Cove Flats, making off from the southern end of the hill on the northern side of the entrance to the cove.

Wing's Cove Flats. Three feet at mean low water is found on these flats one hundred and fifty yards to the southeastward of the southern extremity of the point, and the buoy is placed in fifteen feet about two hundred and twenty-five yards to the eastward of the shoal. It is marked No. 15, and bears from the black buoy on Bird Island Reef nearly $N. \frac{1}{2} E.$, a mile and three-quarters, and from Wing's Neck Light-house $NW. \frac{3}{4} W.$, two miles and a half distant.

Nearly opposite to the buoy on Wing's Cove Flats, on the eastern side of the entrance, bearing about $E. \frac{1}{4} N.$, and three-quarters of a mile off, will be seen a red spar-buoy. This is on Dry Ledge, and the channel between the two buoys has fifteen feet at mean low water. Dry Ledge is the southern extremity of a long shoal or reef making off from Little Bird Island in a southerly direction for seven-eighths of a mile. Little Bird Island is scarcely more than a small sand-spit, about

Dry Ledge. a mile and an eighth $SE.$ by $S. \frac{1}{2} S.$ from Warren Point, and nearly one mile $E.$ by $N. \frac{3}{4} N.$ from the Marion House, at the eastern base of Great Hill. The shoal which makes to the southward from it has from one to eight feet upon it, with many sunken rocks, some of which are awash at low water. Dry Ledge, its southern end, is, however, bare at low tides, and the buoy, which is marked No. 12, is placed in two fathoms on its southwestern side. It bears from Bird Island Light-house $NE. \frac{1}{2} N.$, two miles and a quarter, and from Wing's Neck Light-house $NW. \frac{1}{2} N.$, nearly two miles distant.

When past the buoy on Dry Ledge and up with the Marion House, there will be seen to the northward, and about five-eighths of a mile off, two spar-buoys—one red and one black. The former

Great Flats. is on the southwestern point of Great Flats, which make off from Warren Point in a $S SW.$ direction for three-quarters of a mile, being in places bare at low water and having not more than five feet close to the buoy. This buoy is marked No. 14, and placed in nine feet water $SW.$ of the flats, bearing from the Marion House nearly $N.$, a little over half a mile distant, and from the red buoy on Dry Ledge $NW. \frac{3}{4} N.$, a mile and a quarter distant. From this buoy Nobska Point bears $N.$ by $W.$, three-quarters of a mile distant.

The black spar-buoy on the western side of the channel is on Weweantic River Flats, making off from the northern side of Great Hill to a distance of four hundred yards with less than six feet water,—four feet being found within seventy-five yards of the buoy. **Weweantic River Flats.** The channel between these flats and Great Flats has in no place more than nine feet at low water and is less than three hundred yards wide. The buoy, which is marked No. 17, bears from the Marion House $N.$ by $W. \frac{3}{4} W.$, distant five-eighths of a mile, and marks the western limits of the channel into Weweantic River.

A little over a quarter of a mile to the northward of the red buoy on Great Flats, and off the southern end of Cromeset Neck, will be seen four spar-buoys—two red and two black—in a group close together. These are on the Four Ledges, which are, however, in reality but two, **Four Ledges.** known as *Middle Ledge* and *Cromeset Ledge*,—the red buoys (Nos. 16 and 18) being placed on the northeastern and southwestern parts of the former, and the black buoys (Nos. 19 and 21) on the southwestern and northeastern parts of the latter ledge. The channel between them has seventeen feet at mean low water and is two hundred yards wide.

Four hundred yards to the northward of the red buoy on the northeastern end of Middle Ledge will be seen a black spar-buoy. This is on Fox Rocks,—dangerous rocks lying off the eastern face of Cromeset Neck. One of them, which is always bare, is two hundred feet from the shore, and four feet at mean low water is found a hundred yards farther out and quite close to the buoy, which is marked No. 23 and placed in twelve feet water.

Half a mile to the northward of this buoy will appear another black spar. This is on Beach Point Rock, which is one of the sunken rocks lying off the western shore, to the north- **Beach Point Rock.** westward of Long Beach Point. It is about two hundred and fifty yards from shore and nearly bare at low water. The buoy, which is marked No. 25, is placed in seven feet close to the eastern side of the rock, and bears from Long Beach Point $NW. \frac{1}{2} N.$, nearly four hundred yards distant.

The channel here takes an abrupt turn to the eastward, and two black spar-buoys will be seen **Swift's Flats.** between six and eight hundred yards off, on its northern side. They are numbered, respectively, 27 and 29; and are placed in nine feet at low water on the southern and northern ends of Swift's Flats,—extensive shoals making off from the southern side

of Swift's Neck to a distance of nearly a quarter of a mile with from one to five feet upon them. Here the channel is about two hundred feet wide, and has been dredged to a depth of nine feet at mean low water, and vessels with a fair wind may make a straight wake from the black buoy on the upper end of Swift's Flats to the red spar-buoy on Quohog Bar, carrying not less than nine feet at low tides.

Quohog Bar had formerly but three feet upon it, but the new channel now carries nine feet around the shoal of the bar with a width of about one hundred feet, except at the turn, where **Quohog Bar.** it is somewhat wider. There is here also a black spar-buoy, marking the western

border of the channel at the turn. It is placed in six feet water and is marked No. 31. Above this, in the narrow part of the river abreast of the village, will appear three red spar-buoys, the southernmost being on *The Lower Middle*, the next on *The Upper Middle*, and the northernmost on *Harlow Rocks*,—the last named lying just above the wharf of the Steel Works.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING WAREHAM RIVER.

On the NE. course towards the head of the bay, when Wing's Neck Light-house bears E. by N., a mile and a half, and Bird Island Light-house W. $\frac{1}{4}$ N., a mile and an eighth distant, the summit of Great Hill will bear N NW., two miles and a half distant, and N. by W. will lead into the entrance, carrying not less than fifteen feet at low water until abreast of the eastern point of Great Hill, on which the Marion House is built. Beyond this it is not safe to go without a pilot. These courses pass three-quarters of a mile to the eastward of the black buoy on Bird Island Reef; a quarter of a mile to the eastward of the black buoy on Wing's Cove Flats; and half a mile to the westward of the red buoy on Dry Ledge.

For Sailing Directions for Cohasset Narrows see page 200.

POCASSET AND RED BROOK HARBORS.

Full descriptions of these harbors will be found on page 189. In approaching them from the bay there are no dangers until nearly up to the entrance, when a red spar-buoy will be seen a little to the southward of the course, with another about five-eighths of a mile still farther to the southward. These are on Southwest Ledge, before described on pages 197-198 as a dangerous shoal lying to the westward of Scraggy Neck and awash in places at low water. It lies N. by E. and S. by W., is seven-eighths of a mile long, and there is no passage inshore of it. The buoy on its northern end is marked No. 10, placed in fifteen feet at low water, and marks the southern side of the entrance to Pocasset. It bears from

Southwest Ledge.

	Miles.
Bird Island Light-house, E. by S. $\frac{1}{4}$ S.-----	2 $\frac{1}{8}$
The buoy on Abiel's Ledge, S. $\frac{3}{8}$ W.----- a little over	1 $\frac{1}{4}$
Wing's Neck Light-house, SW. by S.-----	1 $\frac{1}{8}$
The northern end of Scraggy Neck, W. $\frac{1}{4}$ S.-----	1 $\frac{1}{8}$

When past it there are no dangers unless it is desired to enter the Inner Harbor, in which case, on approaching Bassett's Island there will be seen a red spar-buoy off its eastern end. This is on the shoal making off from the western end of that island, (which is mostly dry at low water,) is marked No. 2, and placed in eleven feet close to the spit. When past it the channel into the Inner Harbor leads between Wenaumet Neck and Bassett's Island through a passage a little over two hundred yards wide with from ten to fifteen feet water.

Strangers should not attempt to enter Red Brook Harbor, although the various ledges and shoals in it are well buoyed. A pilot can always be obtained in Pocasset Harbor either at Wing's Neck Light-house or North Pocasset. The passage into this harbor leads from the Inner Harbor of Pocasset along the northern face of Bassett's Island and between its eastern face and the mainland, and not more than six feet can be taken through it. There is another, but very narrow, passage leading into Red Brook Harbor along the southern side of Bassett's Island, between it and Scraggy Neck, through which four feet may be taken.

Anchorage may be found in the Outer Harbor of Pocasset in from two to four fathoms and in the Inner Harbor in from ten to fifteen feet at low water.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING POCASSET HARBOR.

On the NE. course towards the head of the bay, when Bird Island Light-house bears NW. $\frac{1}{4}$ W., seven-eighths of a mile, and Wing's Neck Light-house ENE., two and an eighth miles distant, the depth will be four and a half fathoms, and the course E. by N. will lead safely into the Outer Harbor with not less than eighteen feet. Anchorage may be found on this course anywhere between Wenaumet and Scraggy necks, with soft bottom and depths varying from twelve feet to four and three-quarter fathoms. But, if bound into the Inner Harbor, when, on the E. by N. course, Wing's Neck Light-house bears NW. by N. $\frac{1}{4}$ N., nearly nine hundred yards distant, NE. by E. $\frac{3}{8}$ E. must be steered, which

will lead, with not less than twelve feet, into the Narrows between Wenaumet Neck and Bassett's Island, passing to the northward of the red buoy on the shoal off the northwestern end of that island. In the Narrows the middle of the passage must be kept until fairly into the Inner Harbor,—giving the northern shore of Bassett's Island a berth to the southward of about eighty yards, and anchoring in the bight between the northeastern and northwestern ends of the island in fifteen feet water.

The above courses pass four hundred and fifty yards to the northward of the red buoy on the northern end of Southwest Ledge; eight hundred and fifty yards to the southward of Wing's Neck Light-house; and a little over one hundred yards to the northward of the red buoy off the northwestern point of Bassett's Island.

LIGHT-HOUSE.

NAME.	Latitude.	Longitude West.			Fixed or Revolving.	Height above sea-level.	Distance visible in nautical miles.
		In arc.		In time.			
	° ' "	° ' "	h. m. s.		Feet.		
Wing's Neck Light-house	41 40 50	70 39 37	4 42 38	Fixed.	44	12	

TIDES.

Corrected Establishment at Bird Island Light-house	7 ^h 59 ^m
Mean Rise and Fall of tides	4.4 ft.
Mean Rise and Fall of Spring tides	5.3 ft.
Mean Rise and Fall of Neap tides	3.5 ft.
Mean duration of Rise	6 ^h 51 ^m
Mean duration of Fall	5 ^h 52 ^m
Rise of highest tide observed	6.2 ft.

VARIATION OF THE COMPASS.

The magnetic variation at Pocasset Entrance for 1876 was 10° 45' W., with an approximate annual increase of 2½'. This will give, for 1880, variation 10° 55' W.

CATAUMET HARBOR.

This harbor, the first to the southward of Pocasset, has been fully described on pages 188-189. It is very easy of access, and may be safely entered by strangers by following the directions given below.

DANGERS

IN APPROACHING AND ENTERING CATAUMET HARBOR.

In approaching this harbor there are no dangers in the channel; but when within a mile of Nye's Neck a red spar-buoy will be seen well to the northward of the course and about half a mile off. This is on the southern end of Southwest Ledge, a dangerous shoal lying to the westward of Scraggy Neck, and awash in several places at low water. It lies N. by E. and S. by W., is seven-eighths of a mile long, and there is no passage inshore of it. The buoy is marked No. 8, placed in fifteen feet, and bears from Nye's Neck N N W., a mile and a quarter; from the southern end of Scraggy Neck W., a mile and a quarter; and from Bird Island Light-house S E. by E. ¼ E., two miles and a quarter distant. There is also a red spar-buoy on the northern end of this shoal, marking the southern point of entrance to Pocasset Harbor.

When up with the red buoy on the southern end of Southwest Ledge, a black spar-buoy will be seen to the northward of the course, in range with the middle of Scraggy Neck, and about three-quarters of a mile off. This is on the southern end of Seal Ledge, a mass of rock, bare at half tide, lying about a quarter of a mile from the western shore of Scraggy Neck and nearly three-quarters of a mile to the eastward of the red buoy on the southern end of Southwest Ledge. The buoy is marked No. 1, placed in thirteen feet, and bears from the red buoy on the southern end of Southwest Ledge E. ¼ N., five-eighths of a mile, and from Wing's Neck Light-house S. Easterly, a mile and three-eighths distant. The sailing-lines pass one-third of a mile to the southward of it.

When nearly up with Seal Ledge buoy, a red spar-buoy will appear a little to the southward of the course and a little over half a mile distant. This is on Cataumet Ledge, a detached ledge, with four feet at mean low water, lying on the southern side of the channel, about four hundred yards from shore, and bearing from the red buoy on Southwest Ledge E. by S. ½ S., nearly a mile and a quarter, and from the black buoy on Seal Ledge S E. ¼ E., five-eighths of a mile distant. The buoy is marked No. 2, and placed in fifteen feet on the northern side of the ledge.

When up with the buoy on Cataumet Ledge there will be seen, about a quarter of a mile to the eastward, but on the northern side of the channel, a black spar-buoy. This is on the Southeastern Point of Scraggy Neck, where a long flat makes off for three hundred yards with less than six feet at mean low water. The buoy is marked No. 3, is placed in eight feet water, and bears from the red buoy on the southern end of Southwest Ledge **E. by S.**, a mile and three-quarters distant. *S. E. Point of Scraggy Neck.*

It is not safe for strangers to go much beyond the buoy on the Southeastern Point of Scraggy Neck,—anchorage being found in from two to three fathoms about midway between the northern and southern shores of the harbor, anywhere from three hundred to nine hundred yards to the eastward of the buoy on the southern end of Southwest Ledge. From the anchorage two spar-buoys will be seen near the head of the harbor and about a quarter of a mile off. The black buoy on the northern side of the channel is on *Channel Rock*, awash at low water, and the red buoy on the southern side is on the northern end of *Nye's Flat*, which makes off from the southern shore of the harbor to a distance of three hundred yards. The channel here is very narrow and strangers must not attempt to pass between these buoys.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING CATAUMET HARBOR.

On the **NE.** course through the bay, when Bird Island Light-house bears **N. by E. $\frac{3}{4}$ E.**, a little over two miles, and Wing's Neck Light-house **NE. by E.**, three miles and seven-eighths distant, the depth will be about four fathoms and the course **E. $\frac{3}{4}$ N.**,—which will lead, with not less than three and three-quarter fathoms, to the entrance to the harbor. On this course, when past the red buoy on Southwest Ledge and Wing's Neck Light-house bears **N.**, (with the black buoy on Seal Ledge open a little to the eastward of it,) **E. $\frac{1}{2}$ N.** will lead safely into the harbor, and up to the anchorage, with not less than ten feet at mean low tide.

The above courses pass three-eighths of a mile to the southward of the red buoy on the southern end of Southwest Ledge; one-third of a mile to the southward of the black buoy on Seal Ledge; one hundred and fifty yards to the northward of the red buoy on Cataumet Ledge; and one hundred yards to the southward of the black buoy on the Southeastern Point of Scraggy Neck.

WILD HARBOR.

A full description of this little harbor is given on page 188. It is entirely unobstructed and affords excellent anchorage in from six to fifteen feet at low water. It is, however, seldom used,—vessels as a rule making either Cataumet Harbor or Pocasset Harbor, to the northward of it.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING WILD HARBOR.

On the NE. course up the Bay, when off the harbor of Mattapoiset, in six fathoms, with Ned's Point Light-house bearing **NW. by N. $\frac{1}{2}$ N.**, three miles and three-eighths distant, **E. by N.** will lead directly into Wild Harbor, where vessels may anchor according to their draught. In entering the harbor it is only necessary to keep about midway between Nye's Neck and the southern point of the entrance.

Or, having come along shore, on the Eastern side of the Bay, Nye's Neck should be brought to bear **NE. $\frac{1}{2}$ N.** and steered for until the vessel is within four hundred and fifty yards of the neck, with Wing's Neck Light-house bearing **N. $\frac{3}{4}$ E.**, when **E. by N.** will lead safely into the harbor, as before.

HOG ISLAND HARBOR.

This harbor has also been fully described on page 188. It is a mile and three-quarters to the southward of Wild Harbor and four miles and a half below Wing's Neck Light-house. Strangers cannot enter it, as the channel is very narrow and crooked and has but five feet in it at low tides. The obstructions off the entrance are marked by buoys, but there are no day-marks inside the harbor, and no complete sailing directions can, therefore, be given.

DANGERS

IN APPROACHING AND ENTERING HOG ISLAND HARBOR.

In approaching this harbor from the Southward, or from the vicinity of Wood's Hole, there will be seen, when about two miles from the entrance and well to the eastward of the course, a red spar-buoy

(No. 6). This is on the northwestern end of Gifford's Ledge, a rocky shoal making off from the eastern shore about five-eighths of a mile below Hog Island Point, and bare at low water in some places a quarter of a mile from shore. There is ten feet water close to the buoy, which is placed in fifteen feet three-quarters of a mile from the shore, and bears from Hog Island Point SW. $\frac{3}{4}$ W., seven-eighths of a mile, and from the red buoy on Hamlin Point Rocks (see page 196) N. by E. $\frac{1}{4}$ E., a mile and an eighth distant. From this buoy Wing's Neck Light-house bears N. by E. $\frac{1}{8}$ E.; and it is consequently dangerous, when in its vicinity, to stand to the eastward of that light-house bearing N. by E. $\frac{3}{8}$ E.

When past Gifford's Ledge, and nearly up to the entrance, another red spar-buoy will be seen about a quarter of a mile to the westward of Hog Island Point. This is on Hog Island Ledge, a detached ledge, with four feet at mean low water, lying about four hundred and fifty yards W. $\frac{1}{4}$ S. from Hog Island Point. The buoy is placed in twelve feet just to the westward of the outermost rock, and bears from the red buoy on Gifford's Ledge NE. $\frac{3}{8}$ N., three-quarters of a mile distant. From this buoy Wing's Neck Light-house bears N. $\frac{3}{4}$ E., and it is therefore dangerous for a vessel to go to the eastward of that light-house bearing N. by E. until she is to the northward of the ledge.

If bound into the Harbor.—When up with Hog Island Ledge buoy another red spar-buoy will be seen to the eastward, off the northern side of Hog Island Point, and a quarter of a mile distant. This is on Hog Island Point Shoal, a rocky shoal making off from the northern side of the point for one hundred and fifty yards and bare in some places at low water. The buoy is placed in eight feet on its northern end, marking the southern limits of the channel at this point, and bears from the red buoy on Hog Island Ledge E. $\frac{1}{4}$ N., a quarter of a mile distant. Above this buoy there are no marks.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING HOG ISLAND HARBOR.

I. *From the Northern part of the Bay.*—With Wing's Neck Light-house bearing E., a little over half a mile distant, S. by W. will lead safely along the eastern shore until Nye's Neck bears E. $\frac{3}{8}$ S., when the depth will be five and a half fathoms and the course S. by E., carrying not less than eighteen feet, until off the entrance to Hog Island Harbor, with the southern extremity of Little Island bearing E. $\frac{1}{2}$ S., five-eighths of a mile, or the northwestern end of Hog Island Point SE. $\frac{1}{2}$ E., six hundred and fifty yards distant; when SE. by E. $\frac{3}{4}$ E. will lead safely, with not less than nine feet, to abreast of the red buoy on Hog Island Point Shoal. Or, with Bird Island Light-house bearing W. $\frac{1}{4}$ N., a little over a mile and an eighth distant, S. by E. will lead to the entrance to the harbor; and when the southern point of Little Island bears E. $\frac{1}{2}$ S., five-eighths of a mile distant, SE. by E. $\frac{3}{4}$ E. will lead safely in, as before.

II. *Coming from the Southward.*—On the NE. by E. $\frac{3}{4}$ E. course through the bay, when Ned's Point Light-house bears N. $\frac{1}{2}$ E. and Bird Island Light-house NE. $\frac{3}{4}$ N., E. by N. $\frac{1}{4}$ N. will lead, with not less than four fathoms, up to the entrance, passing half a mile to the northward of the red buoy on Gifford's Ledge. When up with the buoy on Hog Island Ledge it should receive a berth to the southward of about two hundred yards, and the course must be shaped to the eastward so as to pass to the northward of the red buoy on Hog Island Point Shoal.

Or, having come along the Southern shore of the Bay, or from the vicinity of Wood's Hole, as soon as Wing's Neck Light-house can be seen it may be brought to bear NNE. and steered for until Nye's Neck bears NE. $\frac{1}{4}$ N. and the northern extremity of Hog Island Point E. $\frac{3}{4}$ N., a little over a mile and a half distant; when E. by N. $\frac{1}{4}$ N. will lead up to the entrance, as before.

QUISSET HARBOR.

This harbor cannot be entered by strangers and no sailing directions can be given for it, as the channel is very narrow, crooked and shoal, and is obstructed by many dangerous sunken ledges. Seven feet at mean low water can be taken into the harbor, and the more important ledges are buoyed, but no stranger should attempt to enter without a pilot. Quisset Entrance is a mile and seven-eighths to the southward of Hamlin Point, nearly four miles below Hog Island Harbor, and a mile and a half to the northeastward of Wood's Hole. There is a mass of sunken rocks off East Point, marked by a black spar-buoy (No. 1); another dangerous ledge off West Point, marked by a red spar-buoy (No. 2); and a detached rock, with two feet upon it in the middle of the harbor, called Lone Rock, and marked by a spar-buoy painted red and black in horizontal stripes, placed in nine feet on the southern side of the rock.

As before remarked, no sailing directions can be given for this harbor. It is used only by small vessels whose masters are well acquainted with its dangers.

LIGHT-HOUSES IN BUZZARD'S BAY.

NAME.	Latitude.	Longitude West.			Fixed or Revolving.	Interval of Flash.	Height above sea-level.	Distance visible in nautical miles.
		In arc.		In time.				
	° ' "	° ' "	h. m. s.			m. s.	Feet.	
Cuttyhunk Light-house	41 24 50	70 56 59	4 43 48		Fixed.		42	12
Dumpling Rock Light-house	41 32 16	70 55 18	4 43 41		Fixed.		42	12
Clark's Point Light-house	41 35 32	70 54 5	4 43 36		Fixed.		68	13
Ned's Point Light-house	41 39 1	70 47 45	4 43 11		Fixed.		43	11
Bird Island Light-house	41 40 8	70 43 3	4 42 52		F. V. F.	1 30	37	11
Wing's Neck Light-house	41 40 50	70 39 37	4 42 38		Fixed.		44	12

TIDES IN BUZZARD'S BAY.

	Dumpling Rock.	Bird Island Light-house.	Quick's Hole, North Side.	Wood's Hole, North Side.
Corrected Establishment	7 ^h 57 ^m	7 ^h 59 ^m	7 ^h 31 ^m	7 ^h 59 ^m
Mean Rise and Fall of tides	3.8 ft.	4.4 ft.	3.7 ft.	4.0 ft.
Mean Rise and Fall of Spring tides	4.6 ft.	5.3 ft.	4.3 ft.	4.7 ft.
Mean Rise and Fall of Neap tides	2.8 ft.	3.5 ft.	2.9 ft.	3.1 ft.
Mean duration of Rise	6 ^h 50 ^m	6 ^h 50 ^m	6 ^h 31 ^m	6 ^h 51 ^m
Mean duration of Fall	5 ^h 33 ^m	5 ^h 58 ^m	5 ^h 54 ^m	5 ^h 31 ^m
Rise of highest tide observed	5.3 ft.	6.2 ft.	4.8 ft.	5.4 ft.

VARIATION OF THE COMPASS IN BUZZARD'S BAY.

The magnetic variation for 1880 is as follows :

At the entrance to the Bay	10° 20' W.
Off New Bedford	10° 32' W.
Near Quick's Hole	10° 30' W.
Near Wood's Hole	10° 43' W.
Head of the Bay	11° 0' W.

The approximate annual increase is at present 2½'.

ICE IN BUZZARD'S BAY.

The head of the bay and the harbors in its vicinity are generally closed to navigation during the winter months, and the approaches to the harbors on the eastern shore are rendered dangerous by drift-ice, which in severe winters extends across the bay and joins the local formations on the western shore,—thus forming an impassable barrier. In the severe winter of 1874-75 the whole bay was closed, during the larger part of the month of February, as far down as a line from Round Hill Point to Cuttyhunk Island.

Ice forms more rapidly in the bay with the wind from N. to W., as the western shore forms a shelter from such winds; and when the field-ice extends sufficiently far out towards the channel to be affected by these winds, the outer edges are broken up and carried off to the eastern or southern shore, where they form, as drift-ice, a dangerous obstruction to navigation, as above mentioned.

Under ordinary circumstances a NE. wind, if continued for forty-eight hours, will clear the bay of ice. Southerly winds, especially southeasters, bring in a heavy swell, and are of course accompanied by a rise in the temperature, which will be likely to diminish the extent and weaken the strength of the pack.

In New Bedford Harbor steamers can generally make their way in and out during the winter, but sailing vessels require the assistance of a powerful tug-boat to break the ice. During very severe winters, however, like that of 1874-75, the harbor is at times entirely closed to all navigation. Ice forms more rapidly in calms or light winds from N. to W., and strong winds from N. to NE. break it up and carry it off. Other winds have little effect in any way, and the same is true of the tides.

The ice does not usually affect the positions of the spar-buoys in the bay, as they are generally surrounded by air-holes which do not freeze, and permit sufficient movement of the spars to allow the ice to pass over without injuring or displacing them; but the light-vessels, and even the buoys, are sometimes carried away by unusually heavy floes of drift-ice.

WESTPORT HARBOR.

On the western side of Gooseberry Neck (the western point of entrance to Buzzard's Bay) extends Horse Neck Beach in about a NW. by W. direction for two miles and a half to the entrance to Acoakset River, sometimes called Westport Harbor. This beach presents, when viewed from the southward, a mass of sand hillocks with steep faces, forming a line along the shore, and these continue, varying in height and exceedingly irregular and ragged in outline, all the way to the mouth of the river. The beach is backed by thick woods, is rather shoal in its approaches, and is not considered safe to approach within six hundred and fifty yards.

The entrance to this harbor is easily recognized by the long line of sand hillocks on Horse Neck, which extends to the eastern point of entrance to Acoakset River. The river, at its mouth, is but two hundred and fifty yards wide, with a narrow

but crooked channel, and runs in a nearly N. by E. direction for half a mile, where it branches,—the eastern arm running to the eastward for seven-eighths of a mile to the village of **Westport Point**, and then, curving to the northwest-
Acoakset River. ward and northward, spreads out into a wide but shallow bay, having an average width of three-quarters of a mile. This arm is called the **Eastern Branch**, and runs to the northward for about two miles and a half, preserving nearly the same width. It then contracts abruptly to a width of about two hundred yards and runs nearly NNE. for a little over four miles to **Westport Village**, at which point it is a mere creek.

The **Western Branch** has an average width of half a mile for a distance of a little over a mile and a half above the "divide," and above this a width of about three-eighths of a mile, but is very shallow, full of marshy islands, and unfit for navigation except by very small vessels. It runs in a nearly NE. by N. direction for a little over three miles to its head, where empties a small stream connecting the river with **Watuppa Pond**. On the banks of this stream, nearly three-eighths of a mile above its mouth, is built the village of **Adamsville**, which is partly in Massachusetts and partly in Rhode Island.

The eastern point of entrance to Acoakset River is formed, as above mentioned, by the western extremity of **Horse Neck Beach**, while the western point is a remarkable rocky knubble, about thirty feet high, with a peculiar-looking round summit, surmounted by pole and vane,—used as the pilots' mark for entering the river. The Knubble is the more remarkable from the fact that the shore in its vicinity is all low and sandy and covered with short grass. Several large houses
The Knubble. will appear on the southwestern bank about an eighth of a mile to the westward of The Knubble, where the shore forms a sort of cove, and good anchorage is found there in from ten to fifteen feet at low water. The western shore, from The Knubble to the "divide," is of moderate height, very gently sloping, and almost all under cultivation. The higher lands are, however, dotted with thick groves of trees. At the "divide" the houses and shipping at Westport Point are visible over the low marsh lands on the southern shore of the Eastern Branch,—the whole of this southern shore being composed of marshy islands, backed by low flat lands partly wooded and partly cleared.

The northern shore of the Eastern Branch is composed of moderately high, gently sloping land,—the slopes cleared and cultivated and the summit dotted with houses. A few low islets, composed of salt meadow, lie on the northern side of the channel, and parts of the northern shore, also, are fringed with marsh.

About a mile below the wharf at Westport Point lies a large bare rock, called **Crack Rock**, situated close to the northern edge of the channel and within one hundred and fifty yards of a long marshy island. The channel passes close to it.

Above the southern end of The Middle Ground the channel is staked out to Westport Point. In some places both sides are marked, so that it is very easy for a small vessel with a fair wind to go up to the village; but it is not advisable for strangers to attempt to pass above the anchorage on the northern side of The Knubble without a pilot, on account of the winding course and contracted limits of the channel.

Two large rocks, always out, lie nearly in the middle of the river, about an eighth of a mile to the eastward of **Westport Wharf**, and vessels must anchor to the westward of them, as it is not safe, under any circumstances, to pass beyond them without a pilot. Not more than eight feet at low water can be taken up to Westport Point, and this only through a very narrow channel. The shoalest water is between the mouth of the river and The Middle Ground,—eight feet being the deepest found in the channel abreast of the black buoy on the southern end of that shoal.

DANGERS

IN APPROACHING AND ENTERING WESTPORT HARBOR.

I. From the Eastward.—When up with Hen and Chickens Light-vessel there will be seen, about a mile to the northward, a black spar-buoy, with an iron spindle just to the northward of it. Both
The Old Cock. buoy and spindle mark the position of The Old Cock, the southernmost of the long line of shoals, known as *The Hen and Chickens*, making off from Gooseberry Neck to the southward for a mile and three-eighths. The Old Cock is three feet out of water at high tide, and is surmounted by an iron spindle thirty-six feet high with a cage of open work on top,—the whole being painted black. The buoy, which is marked No. 1, is placed just to the southeastward of the spindle in three and a half fathoms, and vessels bound to Westport pass to the westward of it notwithstanding its color,—as it is marked and numbered for Buzzard's Bay.

When up with the buoy on The Old Cock there will be seen, a little to the northward of the course and a mile and an eighth distant, a red nun-buoy. This is on **Lumber Rock**, the southernmost of a group of sunken rocks lying half a mile to the southwestward of Gooseberry Neck and
Lumber Rock. having from three to five feet water upon them. There is no passage between these rocks and the neck. Lumber Rock has five feet; one hundred and fifty yards to the eastward of it is another rock with four feet; and the northernmost rock of the group, called *Hicks' Rock*, has three feet, and is two hundred and fifty yards N. by W. from Lumber Rock. The buoy is a nun of the third class, marked No. 2, and placed in four fathoms on the southwestern side of the rock. It bears from

	Miles.
Hen and Chickens Light-vessel, NW. by N. $\frac{1}{2}$ N.-----	2
The spindle on The Old Cock, NW. $\frac{1}{2}$ N.-----	1 $\frac{1}{2}$
The southern extremity of Gooseberry Neck, SW. $\frac{1}{2}$ W.-----	$\frac{3}{8}$

From this buoy the black spindle on Two Mile Rocks bears **NW. $\frac{1}{4}$ N.**, a mile and five-eighths, and Half Mile Rocks (at the entrance to the river) **NW. by N. $\frac{1}{2}$ N.**, two miles and a half distant. At night, to avoid this rock, as well as The Hen and Chickens, vessels should not go to the eastward of Hen and Chickens Light-vessel bearing **SE. by S. $\frac{1}{4}$ S.**

When past Lumber Rock the course turns more to the northward, and there will soon appear, to the westward of the course, and about three-quarters of a mile off, an iron spindle, thirty-five feet high, with a spherical cage on top,—the whole painted black. This is on Two Mile Rocks, two bare rocks lying **E. and W.** of each other, and about eighty yards apart. **Two Mile Rocks.** From them *shoal water* extends to the southward for one hundred and twenty yards; and a *detached rock, with eight feet at low water*, lies six hundred and fifty yards **SW. $\frac{3}{4}$ S.** from them. The easternmost of the bare rocks bears from

	Miles.
Hen and Chickens Light-vessel, NW. by N. $\frac{1}{4}$ N.-----	3 $\frac{3}{4}$
The spindle on The Old Cock, NW. $\frac{3}{4}$ N.-----	2 $\frac{3}{4}$
The red nun-buoy on Lumber Rock, NW. $\frac{7}{8}$ N.-----	nearly 1 $\frac{3}{4}$

Half Mile Rocks (at the entrance to the river) bear **N. by W. $\frac{3}{8}$ W.**, seven-eighths of a mile distant. The black spindle on Two Mile Rocks is placed on the northwestern end of the dry part of the shoal, and must receive a berth to the southwestward from vessels intending to enter Westport Harbor. The sailing-lines pass six hundred and fifty yards to the eastward of it.

Half a mile to the westward of Two Mile Rocks lies a *group of sunken rocks* extending over a space of a quarter of a mile in a **N NE.** and **S SW.** direction, with soundings varying from six to twelve feet. This group is not buoyed; but the *six feet rock* on its southern end bears from

	Miles.
Hen and Chickens Light-vessel, NW. $\frac{5}{8}$ N.-----	a little over 4
The red nun-buoy on Lumber Rock, NW. $\frac{1}{4}$ W.-----	a little over 2
The black spindle on Two Mile Rocks, W NW-----	a little over $\frac{1}{2}$

Although there is an excellent channel, in no place less than three-eighths of a mile wide, between this ledge and Two Mile Rocks, it is not safe, in the absence of buoys, to attempt to pass through it.

When up with the easternmost of the Two Mile Rocks there will be seen well to the westward, and about three-quarters of a mile off, a black spar-buoy. This is on Dog Fish Ledge, a detached rock, with six feet at mean low water, lying half a mile **S. $\frac{1}{4}$ W.** from The Knubble at the western point of entrance to the river. The buoy is marked No. 3, placed in three **Dog Fish Ledge.** fathoms on the western side of the rock, and bears from the easternmost of the Two Mile Rocks **NW. $\frac{1}{4}$ N.**, a little over five-eighths of a mile distant. From this buoy the red spar-buoy on Half Mile Shoal bears **NE. $\frac{1}{2}$ N.**, half a mile distant. Dog Fish Ledge is often called *Flat Rock.*

When nearly up to the entrance of the river, a red spar-buoy will be seen about six hundred and fifty yards to the eastward of The Knubble and four hundred yards from Horse Neck Beach. This is on the southern end of Half Mile Shoal, a flat making off from the beach to the southwestward for three hundred and fifty yards and having six feet at low water **Half Mile Shoal.** close to the buoy, which is marked No. 4, and bears from the easternmost of the Two Mile Rocks **N. $\frac{3}{4}$ W.**, seven-eighths of a mile distant. From it the mouth of the river bears **NW. by W. $\frac{1}{2}$ W.** and the buoy on The Middle Ground **NW. by W. Nearly.**

About three hundred yards **W. by N.** from the buoy on Half Mile Shoal and nearly the same distance from the western point of entrance to the river, will be seen two bare rocks called Half Mile Rocks. They are bold-to on both sides,—the deepest water lying to the westward of them; but it is usual to pass to the eastward of them through a channel with nine **Half Mile Rocks.** feet water, between these rocks and the buoy on Half Mile Shoal. It is, however, perfectly safe for vessels to pass between Half Mile Rocks and the western point of entrance to the river, and by so doing, with ordinary care, they will carry not less than eleven feet at low water.

On entering the river and standing to the westward towards the anchorage, a spar-buoy painted red and black in horizontal stripes will be seen a little to the northward of the course and about a quarter of a mile off. This is on the southern end of The Middle Ground, a long and narrow shoal making to the southward from the southernmost of the marsh islands in the entrance to Western Branch. It is half a mile long, bare at low water for one-third of its length, and next to the buoy has soundings varying from two to five feet upon it. **The Middle Ground.** The Middle Ground separates the channel leading into Western Branch from that leading to Westport Harbor,—vessels using the former passing to the westward of the buoy; those bound to Westport passing to the eastward of it; while those intending to anchor in the bight on the southern shore do not come within three hundred yards of it.

Above The Middle Ground buoy the channel is staked out up to the village. In some places both sides are marked, so that it is very easy for a vessel having a fair wind, and familiar with the turns of the channel, to go up to Westport Point. Strangers, however, should not attempt to enter the river without a pilot.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING WESTPORT HARBOR.

I. From the Eastward.—No intelligible sailing directions can be given for passing up this river to Westport Point,—the stakes, as above mentioned, being the best guides. But the following rules for approaching it from the eastward may be safely followed. From Hen and Chickens Light-vessel **NW.** by **N.** will lead, with not less than six and a half fathoms, past the spindle on The Old Cock; and should be continued until nearly up with the red buoy on Lumber Rock, which will be in range with the middle of the southern end of Gooseberry Neck on a bearing of **NE. $\frac{1}{2}$ E.** Here the depth will be six and a half fathoms and the course **NNW.**, which will lead, with not less than ten feet, to abreast of Half Mile Rocks, passing between them and the red buoy on Half Mile Shoal. When fairly past the latter, and in nine feet at low water, the mouth of the river will be fairly open bearing **WNW.**, and that course will lead, with not less than twelve feet, to the anchorage in the bight on the southern shore, passing fifty yards to the northward of The Knubble, at the southwestern point of entrance, with three fathoms water. Vessels may anchor anywhere on this shore between The Knubble and the striped buoy on The Middle Ground.

The above courses pass six hundred and fifty yards to the westward of the black buoy on The Hen and Chickens and the spindle on The Old Cock; four hundred yards to the westward of the westernmost rock of The Hen and Chickens; a quarter of a mile to the westward of the red buoy on Lumber Rock; six hundred yards to the eastward of the black spindle on the northwestern end of Two Mile Rocks; three hundred yards to the eastward of the easternmost of the Two Mile Rocks; three-eighths of a mile to the eastward of the black buoy on Dog Fish Ledge; a little over two hundred yards to the westward of the red buoy on Half Mile Shoal, and about seventy-five yards to the eastward of Half Mile Rocks.

DANGERS

IN APPROACHING AND ENTERING WESTPORT HARBOR.

II. From the Westward.—Strangers should not attempt to enter Westport Harbor by the western channel unless in a case of extreme urgency. In such a case, the shore to the eastward of Warren Point must not be approached closely, as it is very foul. *Dangerous bare and sunken rocks*, with six and seven fathoms on all sides of them, lie off this shore at distances varying from three-eighths to seven-eighths of a mile; and none of them are buoyed with the exception of Dog Fish Ledge, close to the mouth of the river. Of these rocks, the first met with after passing Warren Point is called Half Way Rock and is always out. It lies a mile and three-eighths **ENE.** from Warren Point and about six hundred and fifty yards from shore; is quite bold-to, and has soundings of six and seven fathoms on all sides of it. A mile **E.** by **N. $\frac{1}{2}$ N.** from it, and about the same distance from the shore, lie *two sunken rocks* about one hundred yards **N.** and **S.** of each other,—the southernmost having three feet and the northernmost five feet at low water. They should be buoyed, as they are very dangerous to vessels coming from the westward, and no bearings can be given for avoiding them at night. Soundings of from four to eight fathoms are found on all sides of these rocks. To avoid them, in day time, vessels should not stand to the northward of Warren Point bearing **W.** by **S. $\frac{1}{2}$ S.**

A little over three miles and a quarter to the eastward of Warren Point, and two miles **NE.** by **E. $\frac{1}{2}$ E.** from Half Way Rock, lies a *sunken rock, with six feet upon it*, half a mile from shore. There is no passage inshore of this rock, as dangerous shoals make off from Quicksand Point in a **S.** by **E. $\frac{1}{2}$ E.** direction for eight hundred yards, and eight feet is found upon these shoals six hundred yards from the point. It is dangerous to stand to the westward of the western point of entrance to Acokset River bearing **NE.**, which bearing avoids this rock and those inshore of it.

A quarter of a mile **N.** from the six feet rock mentioned above lies a large bare rock, about fifty yards in diameter, called Long Rock. It is about six hundred yards from shore and surrounded by shoal water; and seven hundred yards **E.** by **N. $\frac{1}{2}$ N.** from it, and half a mile **W.** by **N.** from the buoy on Dog Fish Ledge, lies *another detached rock*, a little over six hundred yards from shore, and bare at low spring tides.

None of the above ledges are buoyed, and this channel is, therefore, unsafe for strangers. In coming into the river the course passes an eighth of a mile (two hundred and fifty yards) to the southward, and the same distance to the eastward, of the striped buoy on Dog Fish Ledge, and then turns abruptly to the northward so as to pass about forty yards to the eastward of The Knubble at the western point of entrance to the river,—thus leaving the Half Mile Rocks to the eastward.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING WESTPORT HARBOR.

II. *From the Westward.*—On the course **E. $\frac{1}{2}$ S.** from Brenton's Reef Light-vessel, the light-vessel on The Hen and Chickens will be directly ahead. On this range, when past the mouth of Sakonnet River, with the hotel on West Island bearing **NW.** by **N. $\frac{3}{4}$ N.**, seven-eighths of a mile distant, the depth will be ten fathoms and the course **NE.** by **E. $\frac{1}{2}$ E.**, carrying not less than five fathoms; which will lead up to the black buoy on Dog Fish Ledge—passing an eighth of a mile to the southward of it. On this course, when the western point of entrance to the river bears **N. $\frac{1}{2}$ W.**, **N. $\frac{1}{4}$ W.** will lead, with not less than eleven feet, past Half Mile Rocks and The Knubble; and as soon as the river is fairly open and the large wharf on the southern shore (a few hundred yards to the westward of The Knubble) bears **W.**, that course will lead safely to the anchorage.

The above courses pass eight hundred yards to the southward of Half Way Rock; a quarter of a mile to the southeastward of the three feet rock; six hundred yards to the southeastward of the six feet rock off Quicksand Point; nine hundred yards to the southward of the rock awash to the eastward of Long Rock; two hundred and fifty yards to the southward, and the same distance to the eastward, of the buoy on Dog Fish Ledge; and two hundred yards to the westward of Half Mile Rocks.

VARIATION OF THE COMPASS.

The magnetic variation off Westport Entrance is, for 1880, **10° 20' W.**; with an approximate annual increase of **2 $\frac{1}{4}$ '**.

COAST FROM WESTPORT HARBOR TO SAKONNET RIVER.

From the mouth of Acoakset River the coast has a general course **SW.** by **W. $\frac{1}{4}$ W.** for four miles and a half to Warren Point. Between these two points it is very irregular in outline,—being much indented by small bays and coves. The land is of moderate height and nearly level, with slight undulation; and is composed for the most part of cleared fields backed by woods and dotted with houses. About a mile and a half to the westward of the mouth of the river the white sand hillocks with steep faces, which have formed the distinguishing feature of the coast to the westward of Gooseberry Neck, cease, and the gentle grassy slopes come to the water's edge. All of this part of the coast is foul,—having outlying rocks and sunken ledges from three-eighths to seven-eighths of a mile from shore; and it should not therefore be closely approached.

The boundary line between Massachusetts and Rhode Island strikes the coast at **Quicksand Point** three miles and an eighth to the eastward of Warren Point.

Warren Point is flat and grassy, and shows a precipitous sandy face, with prominent bare rocks in groups at its base. It is entirely bare of trees, but has several houses upon it, and is somewhat bolder-to than the coast to the eastward of it,—six fathoms being found within a quarter of a mile of its southern extremity. At Warren Point **Warren Point.** the coast takes an abrupt turn to the westward, running nearly **W.** for a mile and an eighth, where it extends off in a **SW.** by **S.** direction for nearly a quarter of a mile, forming what is called Sakonnet Point. Between the two points the shore is composed of nearly flat, grassy land, under careful cultivation, dotted with houses and faced with bare rocks,—some of which lie a quarter of a mile from shore.

Sakonnet Point is the true eastern point of Narragansett Bay, the entrance to which, geographically speaking, is contained between this point on the east and Point Judith Neck on the west; but custom has sanctioned the application of the name only to that portion embraced between Brenton's Point, the southwestern extremity of Rhode **Sakonnet Point.** Island, and Point Judith Neck,—the name Sakonnet River being given to that portion of the bay proper contained between Rhode Island and the mainland. Sakonnet Point is low, flat and grassy, with white sandy faces, and covered with a thin growth of grass.

Seen from the southward Sakonnet Point appears to terminate in a rocky head, owing to the number of bare rocky islets lying close in with the extremity of the point. Of these, two are somewhat remarkable,—the larger one, which lies a quarter of a mile **SW.** by **S.** from the point, is called West Island, and is easily distinguished by the large white hotel **West and East Islands.** near its northern end, surrounded by a group of houses of the same color. It is very low and flat except at its western end, where there is a steep hillock about fifteen feet high. East Island lies about four hundred yards to the eastward of West Island and about three hundred and fifty yards **S.** by **E.** from Sakonnet Point. It is about twenty feet high, with a gradual rise, is covered only with grass, and has a single house upon it. Between the two islands, but about two hundred yards farther to the southward, lies **East Rock**, a steep, bare, rocky islet about two hundred yards long, having a somewhat reddish appearance. There is no passage among these islets, nor between them and the point, but they are quite bold-to on their southern sides.

SAKONNET RIVER.

Sakonnet Point is the eastern point of entrance to Sakonnet River, which runs between the mainland on the east and Rhode Island on the west,—communicating directly with Mount Hope Bay and Taunton River, and, by a passage between the northern end of Rhode Island and Bristol Neck, with Narragansett Bay, Bristol Harbor, and Providence River. Its entrance is between

Sakonnet Point on the east and Sachuest Point on the west, and is two miles and a half wide. Above the entrance the width is variable,—gradually diminishing to Fogland Point, (six miles and a half above Sakonnet Point,) where it is only three-quarters of a mile wide; then expanding to a width of a mile and a quarter, and again contracting to a quarter of a mile at the stone bridge, through which narrow passage this river joins Mount Hope Bay. Throughout its length there is deep water,—not less than three and a half fathoms being found in the channel; but it is not well buoyed and is never used by strangers. From its entrance to its point of union with Mount Hope Bay this river is nearly twelve miles long, and is easy of navigation except in the Narrows, between the stone bridge and Common Fence Point, (the northeastern extremity of Rhode Island,) where there is a strong current. Both shores are steep-to, however, and there are no obstructions in the channel, so that the only difficulty experienced is in passing the draws.

Sachuest Point, the southern extremity of Sachuest Neck, (which is the southeastern end of Rhode Island,) is a low, nearly level and grassy point, bare of trees, and may be approached within four hundred yards with five fathoms water. The neck itself is smooth, grassy, and gently sloping, and has several houses on its western side, where it is joined to the island by a smooth beach, called **Sachuest Beach**. **Flint Point**, the northern extremity of the neck, is nearly a mile to the northward of Sachuest Point, and partakes of the same general character, except that its northern face is somewhat steep and precipitous. The eastern shore of the neck is foul,—a number of bare and sunken rocks extending off from that side for over a quarter of a mile; but it is safe to approach within three-eighths of a mile of the neck on that side with not less than seven and a quarter fathoms.

The eastern shore of the river runs about N. by E. for fourteen hundred yards to **Breakwater Point**, a long low point with several houses upon it, behind which, to the eastward, there is formed a convenient shelter for light-draught vessels,—the curve of the shore on the eastern side of the point forming a small semicircular cove, in which anchorage may be found in seven feet at low water, although only five feet can be taken across the bar at its mouth.

From **Breakwater Point** to **Church Point**, a little over two miles above, the eastern shore of the river runs nearly N. with a gentle curve to the eastward, forming what is known as **Church Cove**, which affords anchorage in fine weather. The shore is nearly level, with a very gentle rise to the eastward; is almost entirely bare of trees, under fine cultivation, and thickly dotted with houses. It is not safe, however, to approach **Church Point** nearer than five-eighths of a mile, as there is a *dangerous rock, bare at low water*, lying eight hundred and fifty yards S SW. from the point and nine hundred yards from shore.

Church Point has a perpendicular sandy face, with a grassy summit, bare of trees, and about forty feet high. The land in its vicinity, and in fact all the land on both sides of the river, is well cultivated and dotted with houses.

Directly opposite to **Church Point**, on the western bank of the river, lies **Wood's Castle**, a rocky head with perpendicular faces and grassy summit, bare of trees, three-quarters of a mile above **Flint Point**. Between the castle and the point the curve of the shore-line forms a wide but shallow cove, in which anchorage may be found for vessels of light draught in six feet at low water. The shores of this cove are low and sandy, and the ornamental grounds and villas on **Easton's Point** and in the environs of **Newport** are seen over it.

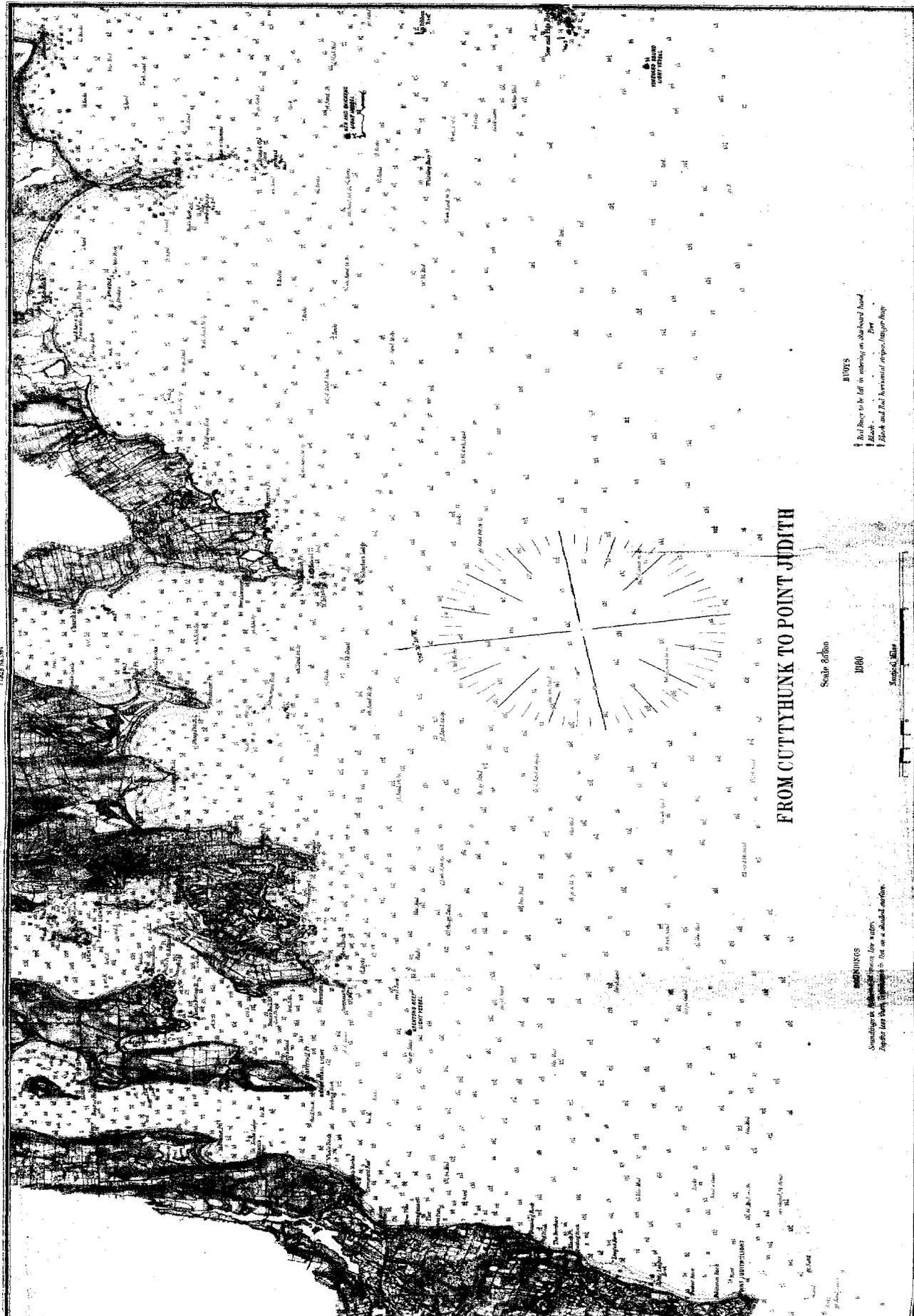
From **Wood's Castle** the western shore of the river has a general course NE. by N. $\frac{1}{4}$ N. to **Black Point**, a mile and seven-eighths above,—the shore being steep and rocky, with gently sloping but nearly flat summits, bare of trees, and varying in height from eighty to one hundred feet. **Black Point** is a bold, bluff, rocky head, with grassy summit and perpendicular rocky face, from twenty to sixty feet high. It is nearly two miles above **Church Point**, on the eastern shore, and all the land in its vicinity is under cultivation.

The eastern shore of the river, from **Church Point** to **Brown's Point**, runs N. by E. $\frac{1}{4}$ E. for a little over a mile and an eighth. The land partakes of the same general character as that to the southward of **Church Point**,—being nearly level, bare of trees, and under high cultivation. **Brown's Point** is very low and flat, with perpendicular face to the westward, and cleared, except on its northern side, where there is a thin growth of trees. It is backed by steeper lands, rising to a height of one hundred feet, with houses and orchards on their summits. **Brown's Point** is half a mile below **Black Point**, on the western shore of the river.

A mile and three-quarters above **Brown's Point** is **High Hill Point**, a bluff, rocky head with perpendicular face, about twenty feet high, grassy and bare of trees. Behind it the land rises with a very gentle slope to a hill one hundred and twenty feet high, known as **Windmill Hill**. All of this part of the shore is under high cultivation. Between **Brown's Point** and **High Hill Point** the general direction of the eastern bank of the river is N. $\frac{1}{4}$ W., but it is somewhat indented,—a large but shallow cove being formed under the southern side of **High Hill Point**, into which empties a small and shallow stream, fed from the waters of **Nonquitt Pond**. From **Brown's Point** to abreast of **Windmill Hill** the shore is somewhat steeper and rises to a height of one hundred feet,—the summits being dotted with orchards; but along the southern side of **High Hill Point** the land is low and sandy and backed by marsh.

Nearly three-quarters of a mile to the northward of **High Hill Point** lies **Fogland Point**, which, when seen from above or below, looks like an island composed of nearly level grass-land, about twenty feet high. It is joined to the mainland by a narrow strip of sand and marsh, and by its projection into the channel-way diminishes the width of the river at this point to three-quarters of a mile. It is shoal in its approaches, fifteen feet at low water being found seven hundred yards to the southwestward of it, and the **Main Channel** of the river passes close to the western shore at this point.

PLATE NO. 100



FROM CUTTYHUNK TO POINT JUDITH

NOTES

- Red lines to be left in entirety on sheared land
- Black lines to be left in entirety on sheared land
- Blue and Red horizontal stripes (Range Buoy)

REMARKS

Sounding at 1000 feet from low water.

Depth less than 1000 feet in the case of shallow water.

Scale of fathoms

1000

Scale of feet

By the projection of Fogland Point from the main shore there is formed on its northern side a convenient cove, in which good anchorage may be found in from eight to twelve feet at low water. A long wharf projects out from the eastern shore of this cove about a quarter of a mile to the northward of Fogland Point and is called **Corey's Wharf**.

On the western shore, a mile and three-eighths to the northward of Black Point, lies Sandy Point, low and flat, but backed by somewhat steep hills, rising to a height of one hundred and forty feet. The slopes of these hills are bare of trees, but their summits are crowned with orchards. The land between Black Point and Sandy Point shows somewhat steep hills, intersected by ravines, through which small streamlets find their way to the river. There are occasional houses, but no trees. **Sandy Point.**

From Sandy Point the western shore has a general course N. by E. for a mile and a half to McCurry's Point, a very low sandy point, backed by high and steep hills, having a group of houses and large orchard half way up the slopes. The land between this and Sandy Point has the same appearance as that in the vicinity of the latter,—showing steep grassy hills, with occasional orchards, but no other trees. The exception to this rule is found, however, three-eighths of a mile to the northward of Sandy Point, where the shore is intersected by a deep and remarkable ravine whose banks are thickly wooded. This ravine is known as **The Glen**. **McCurry's Point.**

McCurry's Point is shoal in its approaches and should be given a berth to the westward of seven hundred yards. In fact, both shores of the river are foul and should not be approached closely by vessels of large draught. The western shore is, however, the shoalest,—long flats making off for two-thirds of the width of the river with less than twelve feet at low water.

Above McCurry's Point the western shore runs first about N. by W. $\frac{1}{2}$ W. for five-eighths of a mile, and then N. by E. $\frac{1}{2}$ E. for two miles,—showing gently sloping lands, beautifully cultivated, dotted with houses and small clumps of trees, and presenting the appearance of a handsome park. In some places the slopes are very gradual, in others the hills rise somewhat steeply,—but all are under cultivation. The heights vary from one hundred to two hundred and eighty feet,—the two most prominent hills being **Quaker Hill**, two hundred and eighty feet high, half a mile to the northward of McCurry's Point, and **Butts' Hill**, one hundred and eighty feet high, two miles and a quarter above the same point.

About a quarter of a mile to the northward of Butts' Hill the high lands retire back from the shore, which here takes an abrupt turn to the westward,—running W. for seven-eighths of a mile, and then turns NNE. for three hundred yards to the western end of the stone bridge. By this curve of the western shore the river is contracted to a width of about six hundred yards, but has a depth of from four to seven fathoms in it, and no obstructions. The land in this vicinity is all low, level and grassy.

On the eastern bank of the river, as above mentioned, a semicircular cove is formed behind Fogland Point; and from the head of this cove the shore runs nearly N. by E. for a mile and three-eighths to the mouth of a narrow and shallow stream called Sapowet Creek. This part of the shore is nearly all composed of very gently sloping lands, beautifully cultivated, and dotted with houses, orchards and small groves of ornamental trees. A quarter of a mile above Fogland Point is Corey's Wharf, before mentioned, a well-known landing place on this river. **Sapowet Creek.**

On the northern side of Sapowet Creek and a mile and three-eighths above Fogland Point is Sapowet Point, a very low, flat, grassy point, with sandy faces and entirely bare of trees. It is about half a mile above McCurry's Point on the western shore, and is much bolder than either that point or Fogland Point,—three fathoms being found within two hundred yards of it. On its northern side the shore turns nearly NE. $\frac{1}{2}$ N. for about half a mile (still continuing low and nearly level) to a small, shallow, semicircular cove about six hundred and fifty yards in diameter. From this cove the shore has a general course N. $\frac{1}{2}$ W. for a mile and three-eighths to the entrance to **Nannaquacket Pond**, a large cove, running in a nearly SSE. direction for about a mile with an average width of a quarter of a mile. This cove is nearly dry at low water from its head for two-thirds of the distance towards its mouth; but below this it affords anchorage, even for large vessels, having an unobstructed channel with from three to five fathoms at low water. **Sapowet Point.**

The entrance to Nannaquacket Pond is through a narrow passage not over sixty yards wide, but with a depth of not less than nineteen feet, and entirely unobstructed, so that the pond forms one of the best and safest anchorages on this part of the coast. This narrow passage is known as **The Bridge Port**.

That portion of the eastern bank of the river to the southward of The Bridge Port is known as Tiverton Neck, and is composed entirely of cultivated lands about twenty feet high, bare of trees except orchards, and rising with a very gentle slope to the summit of the neck, about sixty feet above sea-level. Near its northern end the shore is steep to, and a vessel bound into Nannaquacket Pond may pass within one hundred yards of it and enter The Bridge Port with not less than three fathoms at low water. **Tiverton Neck.**

Six hundred and fifty yards from the western shore of Tiverton Neck, and about five-eighths of a mile below the stone bridge, lies Gould Island, a rocky islet of moderate height, covered thickly with low scrub. It is about two hundred yards in diameter, with a steep rocky face on its southern side, and is quite bold to except on that side, where a long shoal makes to the southward for six hundred and fifty yards with from twelve to fifteen feet upon it. There is equally good water on both sides of Gould Island,—from six to ten fathoms being found in each channel; but it is usual to pass between the island and Tiverton Neck. **Gould Island.**

From The Bridge Port to the stone bridge, three-eighths of a mile above it, the shore is much steeper than that of Tiverton Neck, but, like the latter, composed of cultivated lands. At the eastern end of the bridge there is a small settlement called **Stone Bridge Village**; and here the river is only about five hundred and fifty yards wide. The draw in the stone bridge is nearly in the middle of the river, which, from this bridge to Cedar Island, (a mile and a quarter above,) has an average width of

six hundred and fifty yards, an unobstructed channel, and a depth of from three and a half to nine fathoms. Above Cedar Island it gradually widens until at Common Fence Point, where it joins Mount Hope Bay, it is five-eighths of a mile wide, with a depth in the channel of from four to six and a half fathoms.

All of the eastern shore in the Narrows is composed of cleared and cultivated lands, with somewhat steep slopes, grassy, and bare of trees except occasional orchards. The western shore, on the contrary, is quite low and nearly level, with occasional sand hillocks covered with grass.

Three hundred and fifty yards above the western end of the stone bridge is a low grassy point, with a few hillocks upon it, known as **Almy's Point**. It is the southern point of entrance to a large circular cove, called **The Cove**, which makes into the eastern shore of Rhode Island and has a diameter of about five-eighths of a mile. The entrance to this cove is about two hundred yards wide, with eleven feet at low water; but the depth rapidly decreases as the shores spread away on both sides,—between three and four feet at low water being the best that can be found in it. Several small islands lie in the cove, between the two largest of which (**Spectacle Island** on the north and **Hen Island** on the south) the channel leads. This is a good anchorage for small vessels, being sheltered from all winds, but is not available for those drawing over four feet unless they are willing to lie aground at low water.

The northern point of entrance to **The Cove** is called **Hummock Point**, and is also low and grassy, but is distinguished by a somewhat remarkable hummock upon it. Exactly half a mile above it, and a quarter of a mile above **Anthony's Point**, on the eastern shore, the river is crossed by a second bridge, carrying the Old Colony and Newport Railroad. The draw in this bridge is exactly in the middle of the river, where there is a depth of six and three quarter fathoms.

Nearly half a mile above the railroad bridge, on the western shore of the river, is **Cedar Island**, a long, low and nearly level point, with a few pine trees near its eastern end. It is not in reality an island, but a very narrow neck of land forming the northern shore of a shallow pond, called **Cedar Island Pond**. A few hundred yards above it, on the eastern shore, is a long wharf, known as **Osborne's Wharf**.

From Cedar Island the shore runs **NW. $\frac{1}{4}$ N.** for a quarter of a mile; then **NE. by N. $\frac{1}{4}$ N.** for five hundred and fifty yards to **Common Fence Point**, the northern extremity of Rhode Island, as well as the point of junction of Sakonnet River with Mount Hope Bay. It is a long, low, flat, sandy point, bare of trees, and has an old shanty, with several sheds, near it, on its northern end. A long flat makes off from it to the northward, and it should not be approached from that direction nearer than four hundred yards; while, on the river side, a berth of at least two hundred and fifty yards to the westward should be given to the point.

DANGERS

IN ENTERING AND PASSING THROUGH SAKONNET RIVER INTO MOUNT HOPE BAY.

I. From the Eastward.—The entrance to this river from the eastward is entirely clear, (with the exception of Schuyler's Ledge,) it being only necessary to give East Rock and West Island a berth to the northward and eastward of an eighth of a mile, and Sakonnet Point a berth to the eastward of about eight hundred and fifty yards. This latter distance avoids the shoal water surrounding the numerous outlying rocks to the westward of Sakonnet Point and leaves a channel entirely clear, and over two miles wide, between the eastern shore and Sachuest Neck, on the western side of the entrance.

Schuyler's Ledge, above mentioned, is the only obstruction to the approach to the Sakonnet River from the eastward. It is a small detached rock, about seventy-five yards long **E. by N.** and **W. by S.** and thirty yards wide, and in its shoalest part has but eight feet at mean low water. It has from three and a quarter to six fathoms water on all sides of it; and between it and West Island there exists an unobstructed channel three-eighths of a mile wide with not less than four fathoms. On the southern side of the ledge is placed a red spar-buoy, bearing from West Island **S. $\frac{3}{4}$ W.**, distant nearly half a mile, and from the southern extremity of Sachuest Neck **SE. $\frac{1}{2}$ S.**, distant about three miles.

It is not safe to approach the eastern side of Sachuest Neck nearer than six hundred yards, as there is a dangerous group of rocks, most of which are bare at low water, lying off the neck near its northern end. They are known as **Island Rocks**, and extend off to the eastward for five hundred yards. The largest of these rocks is always out, lies two hundred yards from shore, and at low water is joined to the neck by a dry reef. None of these rocks are buoyed, as they are always visible; but about three-eighths of a mile to the northward of them and to the northeastward of Flint Point will be seen a black spar-buoy (No. 3). This is on the eastern edge of what is locally known as **Smith's Reef**, and marks the western limits of the channel.

On approaching Church Point from the southward it is necessary to give it a berth to the eastward of not less than eight hundred and fifty yards to avoid Church Point Reef, which makes off from that point in a **SW. by S. $\frac{1}{2}$ S.** direction for nine hundred yards,—the southern extremity of the reef being nine hundred yards from the shore of Church Cove, and marked by a group of bare rocks, which may be approached from the southward within twenty-five yards with not less than three fathoms water. Off the southwestern end of the reef, about one hundred yards from the bare rocks, (locally known as **Old Bull Rocks**), is placed a red

spar-buoy (No. 2) in fifteen feet water. When up with Church Point, having it bearing *Dangers---Sa-* anywhere from **E NE.** to **SE.**, it may be approached within four hundred and fifty yards *konnet River.* with not less than four fathoms water.

From Wood's Castle, three-quarters of a mile above Flint Point, the western shore is quite bold-to for over half a mile to the northward, and may be approached within one hundred and fifty yards with not less than three and a half fathoms. Above this, and as far up as Black Point, large vessels should not approach nearer than four hundred and fifty yards; while those of ten feet draught and less may safely stand to within one hundred and fifty yards.

The eastern bank of the river, from Church Point to Brown's Point, should be given a berth of about four hundred yards, except abreast of the small cove on the southern side of Brown's Point, where the shore should not be approached nearer than three-eighths of a mile. Above Brown's Point it is not safe for large vessels to approach this shore nearer than five hundred yards, except at the base of the somewhat steep hill five-eighths of a mile to the northward of Brown's and exactly opposite to Black Point, where three fathoms may be taken to within one hundred yards of the bank. Hence to High Hill Point, where the shore forms a large bight or cove, it is not safe for large vessels to come nearer than six hundred and fifty yards until up with the point itself, which may be approached within an eighth of a mile.

The western shore, from Black Point to Sandy Point, should not be approached by vessels of large draught nearer than eight hundred and fifty yards until up with the latter, which may be approached within one hundred and fifty yards with four fathoms. The channel between the lines of three fathoms is here but little over four hundred yards wide, as the large bight on the eastern shore, between High Hill and Fogland Point, is quite flat,—nine feet being found eight hundred and fifty yards from shore, and a *detached shoal, with fifteen feet*, lying an eighth of a mile to the westward of this and over half a mile from the eastern bank. Vessels of seven feet draught and less pay no attention to these shoals, but pass High Hill Point and Fogland Point at a distance of two hundred yards, crossing the flats in eleven feet. On the western edge of the nine-foot spot will be seen a red spar-buoy (No. 4). It is almost directly opposite to Sandy Point,—the main channel of the river passing between the two with not less than five fathoms, except on the detached shoal with fifteen feet, (mentioned above,) and another spot just to the westward of it, which has eighteen feet.

The western shore, between Sandy and McCurry's points, should be given a berth of four hundred and fifty yards until within half a mile of the latter, when it should not be approached nearer than seven hundred yards on account of McCurry's Point Shoal, which makes *McCurry's Point Shoal.* in a **SE.** by **S.** direction from the point for six hundred yards with from four to five feet water upon it. It is dangerous for strangers to navigate this part of the river, as there are no buoys and the flats are somewhat bold-to, so that the lead is not a reliable guide.

The eastern shore in this vicinity is equally dangerous,—the whole of the large cove between Fogland and Sapowet points having less than ten feet as far out as a line joining the two points. The only safe rule that can be given for passing this part of the river is to keep midway between the eastern and western shores until up with McCurry's Point, after which the channel runs close over towards Sapowet Point.

Between McCurry's Point and the stone bridge in the Narrows the whole of the western shore is shoal,—not more than fifteen feet being found as far to the eastward as the range of the western end of the bridge with the western end of Gould Island, on a bearing **N.** by **E.** $\frac{1}{4}$ **E.**, until abreast of the southern end of Tiverton Neck, between which and Gould Island the western shore may be safely approached by large vessels within three-quarters of a mile. Vessels drawing twelve feet may approach the eastern shore as far as a line joining Sapowet Point with the northwestern extremity of Tiverton Neck; but large vessels cannot stand to the eastward of the eastern end of the stone bridge bearing **N.** by **E.** $\frac{3}{4}$ **E.** until within three-eighths of a mile of Gould Island, above which the channel runs close under the eastern bank. It is, however, safe to pass either to the eastward or westward of Gould Island, as there is from four to ten fathoms on both sides of it. The eastern, western and northern shores of this island are quite bold-to; but in beating to windward a large vessel should not, in standing across the river, approach nearer to the southern side than three-eighths of a mile; but a vessel of ten feet draught may safely go to within two hundred and fifty yards of the island.

From the western end of the stone bridge a *long shoal, with sixteen feet*, makes to the southward for about twelve hundred yards, past the mouth of The Bridge Port,—its southern end bearing **E.** $\frac{1}{4}$ **S.** from the northern end of Gould Island, four hundred yards distant. Between this shoal and Gould Island the channel has ten fathoms; and on its eastern side, between it and Tiverton Neck, an unobstructed channel one hundred and seventy-five yards wide leads, with not less than four fathoms, into The Bridge Port. But coasters of ordinary draught pay no attention to this shoal, as they can pass within three hundred yards of the eastern shore with not less than sixteen feet at low water.

In the Narrows there are no obstructions below the bridges; but when past the railroad bridge it is necessary to keep the eastern shore aboard in order to avoid an *eleven feet shoal*, which lies off Cedar Island, nearly in the middle of the passage. The southern end of this shoal lies six hundred and fifty yards **N.** $\frac{1}{4}$ **E.** from the draw in the railroad bridge; nearly six hundred yards **SW.** by **W.** $\frac{1}{2}$ **W.**

from Osborne's Wharf; and three hundred yards **SE. $\frac{1}{4}$ S.** from the southeastern extremity of Cedar Island. When Osborne's wharf bears **E. $\frac{1}{4}$ N.**, the vessel is to the northward of this shoal, beyond which there are no dangers until Mount Hope Bay is entered.

SAILING DIRECTIONS

FOR ENTERING AND PASSING THROUGH SAKONNET RIVER INTO MOUNT HOPE BAY.

I. From the Eastward.—A vessel from the eastward wishing to enter this river should make Vineyard Sound Light-vessel, (see pages 185-186,) and from it steer **NW.** by **W. $\frac{1}{2}$ W.** for about ten miles and a half; when the entrance will be fairly open, with the hotel on West Island bearing **NE. $\frac{3}{8}$ E.**, about one mile distant. The depth at this point will be eleven fathoms, with Brenton's Reef Light-vessel bearing **W. $\frac{3}{8}$ N.**, and **N. $\frac{1}{4}$ E.** will lead up the river, with not less than five fathoms, until half a mile to the northward of Church Point, where the depth will be four and a half fathoms, with Brown's Point bearing **NE. $\frac{3}{8}$ E.**, nearly a mile distant. Thence the course is **NE.** by **N. $\frac{3}{4}$ N.**, carrying four and a half fathoms for nearly three-quarters of a mile; when Brown's Point will bear **E. $\frac{1}{2}$ S.**, half a mile, and Black Point **NW.** by **N. $\frac{1}{8}$ N.**, seven-eighths of a mile distant. From this position **N. $\frac{3}{4}$ W.** will lead, with not less than three and a quarter fathoms, past High Hill Point and Sandy Point; and when about four hundred and fifty yards above the latter, in six fathoms, the northern end of Fogland Point will bear **NE.** by **E. $\frac{1}{4}$ E.**, and **NE.** by **N. $\frac{1}{2}$ N.** will lead, with not less than three and a half fathoms, up to Sapowet Point. When this point bears **E. $\frac{1}{2}$ S.**, three hundred yards distant, the depth will be four and a half fathoms and the course **N.** by **E. $\frac{1}{4}$ E.**, carrying not less than three and a half fathoms, until within half a mile of Gould Island and the group of houses on the summit of Tiverton Neck bears **E.** Here the depth will be six and three-quarter fathoms, and **NNE.** will lead safely up to the entrance to The Bridge Port with not less than four fathoms; *or, if bound through the bridges*, **N. $\frac{1}{2}$ E.** will lead to abreast of the northern end of Gould Island, passing to the eastward of it about one hundred and fifty yards. When the northern end of this island bears **W. $\frac{1}{4}$ N.**, **N.** by **E. $\frac{3}{8}$ E.** will lead, with not less than five fathoms, directly through the draw in the stone bridge. From this bridge to the railroad bridge the distance is three-quarters of a mile, and no directions are necessary other than to keep off the shores. When through the railroad bridge, **N.** by **E. $\frac{1}{2}$ E.** will lead, with not less than six and a half fathoms, to abreast of Common Fence Point, passing about one hundred and fifty yards to the eastward of "the eleven feet shoal."

The above courses pass three-eighths of a mile to the southward, and five-eighths of a mile to the westward, of Schuyler's Ledge; nearly three-quarters of a mile to the westward of West Island; half a mile to the westward of the westernmost of the shoals off Sakonnet Point; eight hundred yards to the westward of Church Point Reef; half a mile to the westward of Brown's Point; seven hundred yards to the eastward of Black Point; an eighth of a mile to the eastward of Sandy Point; six hundred and fifty yards to the westward of Fogland Point; four hundred yards to the eastward of McCurry's Point Shoal; three hundred yards to the westward of Sapowet Point; the same distance to the eastward of the easternmost point of the flats to the northward of McCurry's Point; one hundred and fifty yards to the eastward of the shoal **S.** of Gould Island, and the same distance to the eastward of the island itself; and a little over one hundred yards to the westward of the westernmost point of the flats between the stone bridge and the entrance to The Bridge Port.

A vessel of twelve feet draught or less, however, may, when West Island Hotel bears **NE. $\frac{3}{8}$ E.**, about one mile distant, as before, steer **N. $\frac{1}{2}$ E.**, which will lead safely up the river to above Sandy Point; and will cross the shoal in mid-river, just below Fogland Point, in fifteen feet at low water. On this course, when "The Glen" bears **W.** by **N. $\frac{1}{2}$ N.**, and the northwestern extremity of Fogland Point **NE.**, half a mile distant, **NNE.** *Northerly* will lead up to Sapowet Point. When this point bears **E. $\frac{1}{2}$ S.**, three hundred yards distant, **N.** by **E. $\frac{1}{4}$ E.** will lead directly to the draw in the stone bridge, crossing the shoal off the entrance to The Bridge Port in sixteen feet water. The least water on the above courses is fifteen feet.

A vessel from Buzzard's Bay will steer **W. $\frac{1}{2}$ N.** from Hen and Chickens Light-vessel until the hotel on West Island bears **N. $\frac{3}{8}$ E.**, nearly a mile distant. Here the depth will be ten fathoms and the course **NW.** by **W. $\frac{1}{2}$ W.** for nearly three-quarters of a mile, or until the hotel bears **NE. $\frac{3}{8}$ E.**, about a mile distant, when **N. $\frac{1}{4}$ E.** or **N. $\frac{1}{2}$ E.** must be steered, according to draught, following the directions given for the river.

DANGERS

IN ENTERING AND PASSING THROUGH SAKONNET RIVER INTO MOUNT HOPE BAY.

II. *From the Westward.*—The only obstruction in the approaches to this river from the westward is Cormorant Rock, a bare rock, lying three-quarters of a mile S. by W. from Sachuest Point, and surrounded by shoal water. To the northward of the rock the shoals extend for three hundred and fifty yards, while four hundred yards to the southward of it is a detached rock, with two feet at mean low water, known as *Cormorant Ledge*. Between this and the rock there is a channel about one hundred yards wide with six and a quarter fathoms, but it is of no use to strangers.

*Cormorant
Rock.*

Between Cormorant Rock and Sachuest Point there is a channel half a mile wide with not less than five fathoms, and perfectly safe, even for strangers, by keeping nearest to Sachuest Point or by not approaching Cormorant Rock nearer than a quarter of a mile. On the southern side of Cormorant Ledge is placed a black spar-buoy marked No. 1.

After passing Cormorant Rock there are no dangers until the river is entered,—the dangers in which have been already described, on pages 246–248.

SAILING DIRECTIONS

FOR ENTERING AND PASSING THROUGH SAKONNET RIVER INTO MOUNT HOPE BAY.

II. *From the Westward.*—From Brenton's Reef Light-vessel the course is E. $\frac{1}{2}$ S., carrying not less than ten fathoms, until the southern extremity of Sachuest Point bears N. $\frac{1}{2}$ W., a little over a mile and a half distant. The hotel on West Island will be directly ahead, bearing E. $\frac{1}{4}$ S., a mile and seven-eighths distant, and NE. by N. $\frac{3}{4}$ N. will lead, with not less than four and a half fathoms, up to Brown's Point. When this Point bears E. $\frac{1}{2}$ S., nearly half a mile distant, the course will be N. $\frac{3}{4}$ W., following the directions previously given for the river.

Or, if the vessel be of twelve feet draught or less, she may, when, on the NE. by N. $\frac{3}{4}$ N. course, Brown's Point bears NE. $\frac{3}{4}$ E., nearly a mile distant, steer N. $\frac{1}{2}$ E., and follow the directions given above for light-draught vessels.

The above courses pass five-eighths of a mile to the southward, and nearly half a mile to the eastward, of Cormorant Ledge; three-quarters of a mile to the southward, and half a mile to the eastward, of Cormorant Rock; and four hundred yards to the eastward of the easternmost of the Island Rocks.

Sakonnet River is very little used at present, owing to the absence of buoys on the upper flats and the loss of time in passing through the bridges. If well buoyed, however, it would afford an easy and commodious passage from the eastward into Mount Hope Bay and thence to Fall River and Taunton.

NARRAGANSETT BAY.

As before mentioned, on page 243, the entrance to this bay is contained between Sakonnet Point on the east and Point Judith Neck on the west, but custom has decreed that Brenton's Point, the southwestern point of Rhode Island, shall be considered as its eastern point of entrance. Between this point and Narragansett Pier (at the northern extremity of Point Judith Neck) the width of the entrance is a little over four miles and a half; but it is divided into two channels, called the Eastern and Western passages, by Conanicut Island. The bay lies N. by E. and S. by W., and is about fifteen miles long from Brenton's Point to the mouth of Providence River, at its head. Its width varies,—being, as before mentioned, four miles and a half at its entrance, with an average width of five miles as far up as Popasquash Point, and thence about three miles to the mouth of Providence River. The shore-line is very irregular and the bay is full of islands and islets,—the two largest of which are Conanicut and Prudence islands. Several important towns are built upon its shores,—the principal of which are Newport, Wickford, Bristol and Greenwich,—and the country on both sides is thickly settled and carefully cultivated. On its eastern side it communicates, by a passage between Bristol Neck and the northern end of Rhode Island, with Mount Hope Bay and Taunton River, (on the eastern shore of which is built the important manufacturing town of Fall River,) and, at its head, through Providence River, with the city of Providence, the capital of the state of Rhode Island.

RHODE ISLAND.

This, the largest island in the bay, lies in a nearly NNE. and SSW. direction and is about thirteen miles long. Its shape is very irregular,—the shores being indented by many coves, and it is thickly settled and well cultivated,—the surface being for the most part gently sloping, undulating, and covered with cultivated fields, orchards, and occasional groves of trees. The highest hills are about two hundred and sixty feet.

The southeastern point of Rhode Island is called Sachuest Neck, and has been already described as the smooth, nearly level and grassy neck, about forty feet high, with precipitous faces to the southward and eastward, lying on the western side of the entrance to Sakonnet River. On the western side of this neck the southern shore of the island is indented by two large coves with smooth, flat, sandy beaches, backed by a thickly settled country

Sachuest Neck.

of moderate height. The easternmost of these coves is about a mile wide and has from three to five fathoms in it, but affords little shelter and has poor holding-ground, so that it is of little importance except as a bathing place.

On its western side this cove is separated from Easton's Cove by Easton's Point, a grassy, gently sloping point, dotted with houses, and showing a nearly perpendicular face, about twenty feet high, to the southward and eastward. Dangerous rocks lie off this point, and it is not safe to approach it from the southward nearer than half a mile.

Easton's Point. lies on its western side, contained between this point and **Ochre Point** on the west. Between these limits it is about three-quarters of a mile wide with from two to four fathoms in it; but, like the cove to the eastward, is of no importance as an anchorage. **Easton's Beach**, at the head of this cove, is the principal bathing place on the island. From this beach to Ochre Point, nearly a mile to the southward, the shore is of moderate height, faced with rocks, and its summit thickly covered with villas and handsome houses, forming part of the suburbs of Newport.

On the southern side of Ochre Point there is a small shallow cove, about half a mile wide, whose southern point is known as **Sheep Point**; and a little over five-eighths of a mile to the southward of this is Coggeshall's Point,—both points being gently sloping and thickly covered with houses, and both dangerous to approach nearer than three-eighths of a mile on account of the numerous outlying rocks and sunken ledges. Of these the most important are the **Gull Rocks**,—a group of half-tide ledges an eighth of a mile to the eastward of Sheep Point; and Coggeshall's Ledge, which lies about two hundred and fifty yards to the southward of Coggeshall's Point and is bare at low water.

From Coggeshall's Point the shore has a general course about **W. $\frac{1}{2}$ N.** for a mile and seven-eighths to Brenton's Point, the southwestern extremity of Rhode Island; but throughout this distance it is very much cut up by large coves and indentations and is not safe to approach. None of these coves are of any importance,—being shallow and full of ledges and sunken rocks. Nor is it safe to approach this part of the shore between Coggeshall's and Brenton's points nearer than to bring Brenton's Reef Light-vessel to bear **W. $\frac{1}{2}$ S.**

A low rocky islet, covered only with grass and surrounded by dangerous ledges, lies off this shore about five-eighths of a mile to the westward of Coggeshall's Point and two hundred and fifty yards from the eastern shore of Cherry Neck. It is called **Gooseberry Island**, and cannot be safely approached. Cherry Neck is about midway between Coggeshall's and Brenton's points, and is low, flat and grassy, and faced with rocks. On its western side makes in a narrow cove of irregular shape and about three-eighths of a mile long, but of no importance. The western side of this cove is formed by Price's Neck, which is nearly half a mile long, and composed of low, nearly level and grassy land, except at its southern extremity, where it terminates in a mass of bare rock destitute of all vegetation. It is quite bold-to on its southern side, and may be approached within one hundred yards with not less than four fathoms.

Brenton's Point is the southern extremity of Rhode Island, and is composed of smooth, gently sloping, grassy land, rising to a height of about sixty feet at its summit, (which is about half a mile from its southern extremity,) and **Brenton's Point.** has a group of houses on it. The slopes are dotted with handsome villas surrounded by ornamental grounds. All that portion of Rhode Island contained between Ochre Point on the east and Brenton's Point on the west is known under the general name of **The Neck**.

About two miles above Brenton's Point, on the western shore of the island, lies **Newport Harbor**, formed by an irregular indentation about three-quarters of a mile wide. In the middle of its entrance lies **Goat Island**, separating it into two channels, and the city of **Newport** occupies its eastern shore.

A mile and a half to the northward of Goat Island is **Coasters' Harbor**,—a small cove, formed between **Coddington Point** on the north and **Coasters' Harbor Island** on the south. It affords comfortable anchorage in six and seven feet at low water. **Coddington Cove**, on the northern side of the point, affords good anchorage in from three to four fathoms, with good holding-ground and an entirely unobstructed entrance.

Above Coddington Cove there are no convenient anchorages,—the shore having a general course **NE. by N.** (although somewhat indented) for six miles to **Coal Mine Point**, the northwestern extremity of the island. This point **Coal Mine Point.** is easily recognized by the large wharf and the numerous sheds and workshops connected with the mines. The land is about forty feet high at its summit, but has a very gentle slope to the water's edge.

At **Coal Mine Point** the northern shore of the island begins,—taking a general direction **NE. by E. $\frac{1}{2}$ E.** for three miles and a quarter to **Common Fence Point**, the northern extremity of the island, and also the western point of entrance to Sakonnet River from the northward. It is a long, low, flat, sandy point, bare of trees, and has an old shanty, with several sheds near it, on its northern end. A long flat makes off from it to the northward, and it should not be approached from that direction nearer than four hundred yards.

The eastern shore of Rhode Island has been already described in detail in the approaches to Sakonnet River. (See pages 243-246.)

COANICUT ISLAND.

This island, the next in size and importance to Rhode Island, lies just to the westward of it,—its southern extremity being a mile and seven-eighths to the westward of Brenton's Point. It lies **N NE.** and **S SW.**; is seven miles and a half long and very irregular in shape; but the main body of the island has an average width of between a mile and a mile and a quarter. Its surface is hilly and undulating, but the hills are lower than those on Rhode Island,—the greatest height being about one hundred and thirty-five feet. It is almost entirely cleared and under fine cultivation and its summit and slopes are dotted with houses. Near its southern end is a very peculiar formation, consisting of a peninsula two miles and a half long in a **N. by E.** and **S. by W.** direc-

tion, and nearly five-eighths of a mile wide, joined to the main body of the island by a narrow strip of sand about fifty yards wide and three hundred long and scarcely elevated above high water. On the southern side of this sand strip there is formed between the main body of the island and this peninsula a large cove, nearly a mile long and six hundred yards wide, called **Mackerel Cove**. It has good anchorage, in northerly winds, in from ten feet to five fathoms, but is entirely open to seaward.

The large peninsula above mentioned is composed of gently sloping cleared lands, with a few houses scattered over its surface, and on its eastern side has a somewhat steep slope towards Mackerel Cove. It terminates to the southward in a smooth, grassy neck, almost entirely cleared, but having a grove of trees about midway of its eastern face. Its shape is irregular but approaching the oval, and from the fancied resemblance to the tail of a beaver it has received **The Beaver Tail and Light-house**. This peninsula terminates in a low, smooth, rocky point covered with grass,—on the southern extremity of which is built the light-house called **Beaver Tail Light-house**, which, situated as it is in the middle of the entrance, serves as a guide to both the Eastern and Western passages. It is a square granite tower, forty-five and a half feet high, attached to the keeper's dwelling, which is painted white, and it shows a fixed white light, of the third order, from a height of sixty-eight feet above the sea, visible thirteen miles. Its geographical position is

Latitude 41° 26' 56" N.
 Longitude 71° 23' 59" W.

A first-class **Daboll fog-trumpet**, giving blasts of six seconds at intervals of ten seconds and fifty seconds alternately, is placed close to the light-house, and can be heard by vessels coming from the eastward for some time before the bell on **Brenton's Reef** Light-vessel is heard.

The following are the bearings and distances of **Beaver Tail Light-house** from prominent points on the coast: From

	Miles.
Point Judith, NE. $\frac{1}{2}$ N.	6 $\frac{1}{2}$
The black buoy on the northern end of Sandy Point Shoal, (the northern extremity of Block Island,) NE. $\frac{1}{2}$ N. Nearly	14 $\frac{1}{2}$
Block Island North Light-house, NE. $\frac{1}{2}$ N.	15 $\frac{1}{2}$
Block Island Southeast Light-house, NE. by N. $\frac{1}{4}$ N.	18 $\frac{1}{2}$
Brenton's Reef Light-vessel, NW. by N. $\frac{3}{4}$ N.	nearly 1 $\frac{1}{2}$
Hen and Chickens Light-vessel, W. by N.	15 $\frac{1}{2}$
Cuttyhunk Light-house, W. by N. $\frac{1}{2}$ N.	19 $\frac{1}{2}$
Vineyard Sound Light-vessel, WNW.	18 $\frac{1}{2}$
Gay Head Light-house, NW. by W. $\frac{3}{4}$ W.	25 $\frac{1}{2}$
Davis' or New South Shoal Light-vessel, NW. $\frac{1}{4}$ W.	77 $\frac{1}{2}$

From this light-house

	Miles.
Dutch Island Light-house bears N. $\frac{1}{2}$ E.	nearly 2 $\frac{3}{4}$
Fort Dumpling NE. by E. $\frac{1}{4}$ E.	nearly 2 $\frac{1}{2}$
Goat Island Light-house NE. by E. $\frac{1}{4}$ E.	4 $\frac{1}{2}$
The pier on the northern side of Fort Adams NE. by E. $\frac{3}{4}$ E.	3 $\frac{1}{2}$

Beaver Tail Point, the site of the light-house, must not be approached from the southward nearer than a quarter of a mile, as it is shoal to a distance of three hundred yards and there is a dangerous bare rock, called **Newton's Rock**, two hundred yards SW. by S. $\frac{1}{4}$ S. from the point.

The northwestern extremity of the peninsula, of which **Beaver Tail Point** is the southern end, is called **Beaver Head**, and forms the southern point of entrance to **Dutch Island Harbor**,—a commodious harbor with excellent anchorage in from two to eight fathoms,—contained between the western shore of **Conanicut**, the northern face of **Beaver Head**, and **Dutch Island**, which lies nearly in the middle of the **Western Passage**. **Beaver Head** is about thirty feet high, with precipitous rocky faces between ten and fifteen feet in height, and a nearly level summit composed entirely of rich grass land. It is shoal on its northern side and should not be approached nearer than four hundred yards in going into **Dutch Island Harbor**.

Dutch Island lies about NE. and SW., is nearly five-eighths of a mile long, and the main portion has an average width of five hundred yards; but it rapidly contracts towards the southern end, where it terminates in a long, low and very narrow point, on the southern extremity of which is built the light-house. The island is about sixty feet high,—being highest near its centre, where there is a large earth-work, and a number of houses are seen on its western slopes, forming quite a settlement. These are the temporary barracks and laborers' quarters. Where not occupied by the works **Dutch Island and Light-house**. The island is grassy and under cultivation. Its eastern shore is quite bold to,—six fathoms being found within one hundred yards of it;—but its western and northern shores should receive a berth of at least two hundred and fifty yards, as they are somewhat foul. **Dutch Island Light-house** is a square white tower, attached to a dwelling of the same color, situated on the extreme southern end of the island, and shows a fixed white light, of the fourth order, from a height of fifty-six feet above the sea, visible thirteen miles. It is the guide to the **Western Passage** of **Narragansett Bay** and also to the southern entrance to **Dutch Island Harbor**; and vessels entering this harbor may pass within one hundred and fifty yards of it with not less than five fathoms water. Its geographical position is

Latitude 41° 28' 46" N.
 Longitude 71° 24' 16" W.,

and it bears from Beaver Tail Light-house **N. $\frac{1}{2}$ E.**, nearly two miles and seven-eighths distant. From this light-house Quonset Point bears **N. by E.**, five miles and three-eighths, and the black buoy on Fox Island Shoal **N. $\frac{1}{2}$ E.**, nearly three miles and a half distant.

A bell is struck by machinery, during thick weather, at intervals of fifteen seconds.

Above Dutch Island Harbor the western shore of Conanicut Island has a general course **N. by E. $\frac{1}{2}$ E.** for about two miles and five-eighths to Sand Point,—a low, flat and nearly level point, about twenty feet high at its summit, covered with grass and entirely bare of trees. It is somewhat foul, and the shore in its vicinity should not be approached nearer than three hundred and fifty yards. The whole of the western shore between Dutch Island Harbor and Sand Point is composed of cleared and cultivated fields,—the land rising with a gentle slope to the summit of the island, which is from one hundred to one hundred and forty feet high. There are occasional small groves of trees on the slopes and single trees here and there.

From Sand Point the shore runs about **NE. $\frac{1}{2}$ N.** for one mile to North Point,—the northern extremity of the island. This is a gently sloping grassy point, about twenty feet high, bare of trees and inclosed by fences. Behind it the land rises with a gradual ascent to a height of one hundred feet and is all under cultivation. North Point may be approached within an eighth of a mile with not less than four fathoms at low water; and there is a passage a mile and a half wide, with from three to five fathoms in it, and entirely unobstructed, between this point and the southern end of Prudence Island.

The eastern shore of Conanicut has a general direction nearly **NNE.** and **SSW.**, and partakes of the same general character as the western shore,—being composed almost entirely of cleared and cultivated lands, somewhat undulating, and varying in height from sixty to one hundred feet. In coming into the Eastern Passage the southeastern point of the island will appear as a rugged rocky point, bare of trees, and surmounted by a low circular stone tower,—the remains of an ancient work, now known as **Fort Dumpling**. All of this southern shore of the island between Mackerel Cove and the southeastern point has a very rugged appearance,—being entirely composed of rocky hillocks destitute of trees. The southeastern point of the island is called **Bull Point**, and has a line of bare rocky islets extending in a **NE.** direction from it for four hundred and fifty yards.

PRUDENCE ISLAND.

Prudence Island, the northernmost of the large islands separating the Eastern and Western passages, is of very irregular shape and about five miles and a half long. Its southern half is somewhat oval in shape, with a length of three miles and an average width of nearly one mile, and lies nearly **NNE.** and **SSW.** Like Rhode Island and Conanicut, it is composed of cleared and cultivated lands, with undulating outline,—the cleared fields being diversified with occasional orchards and groves of trees. Near the centre of this southern half the land attains its greatest height of one hundred and sixty feet, and the summit is crowned with a number of buildings and a large orchard. From this summit it slopes somewhat steeply to the eastward and terminates

in a low, flat, sandy point known as **Sand Point**, which may be called the eastern point of the island. Upon Sand Point is built a light-house which is one of the guides to the approaches to Mount Hope Bay, Bristol and Providence, and is called **Prudence Island Light house**. It is an eight-sided whitewashed tower, twenty-five feet high, and shows a fixed white light, of the fifth order, from a height of thirty feet above the sea, visible eleven miles. Its geographical position is

Latitude	-----	41° 36' 27" N.
Longitude	-----	71° 18' 30" W.,

and it bears from Goat Island Light-house **NE. by N. $\frac{1}{2}$ N.**, six miles and three-quarters distant. From this light-house Bristol Ferry Light-house bears **NE. $\frac{1}{2}$ E.**, nearly three miles, and Popasquash Point **N. by E. $\frac{1}{2}$ E.**, two miles and five-eighths distant.

The southern end of Prudence Island is low, nearly level and grassy, with a few low trees on its extremity. It is somewhat foul, and should not be approached from the southward nearer than three hundred and fifty yards.

Three miles and a half above the southern end of Prudence Island the high lands, forming the southern half of the island terminate; and low, flat, grassy lands begin and extend in a **NW. $\frac{1}{2}$ W.** direction for a little over a mile,—the island being here between five and six hundred yards wide. This narrow strip or neck of low land joins the high lands of the southern part of the island to a smooth grassy hill on the northern part, called **Pine Hill**. It is about eighty feet high, with a very gradual rise, and its eastern slopes are occupied by a large orchard and several buildings. The southern extremity of this hill, which is on the western side of the island, is called **Pine Hill Point**, a grassy point, nearly level, with precipitous sandy face about twenty feet high. Dangerous ledges lie off its southern end, extending to a distance of five hundred and fifty yards; but its western face may be approached within two hundred yards with not less than four fathoms water.

On the eastern side of the island, at the eastern base of Pine Hill, there is formed, by the peculiar curves of the shore-line, a large cove, called **Potter's Cove**, in which anchorage may be found in from nine to twelve feet at low water. **Gull Point**, the eastern point of entrance to this cove, is low, flat, sandy and entirely bare of trees; and is the southern extremity of a narrow neck, about three-eighths of a mile long in a **S. by E.** direction, which protects the cove from northeasterly winds.

From Pine Hill Point the general direction of the northern part of the island is **N. by E.** for two miles and an eighth to its northern end, known as **North Point**; but the shore-line, especially on the western side, is very irregular and much cut up by



Beaver Reef
L. 10.000

Beaver Reef
L. 10.000

Coastal L. 10.000

Approaches to Narragansett Bay from the Eastward, Breton's Reef L. Vessel bearing W. N. E. about 14 Miles.



Beaver Reef
L. 10.000

Approaches to Narragansett Bay from the Westward, Beaver Reef L. E. bearing N. E. about 28 Miles.



Beaver Reef
L. 10.000

Beaver Reef
L. 10.000

Beaver Reef
L. 10.000

Approaches to Narragansett Bay by Eastern Channel, Beaver Reef L. E. bearing N. E. about 24 Miles.



Coastal L. 10.000

Coastal L. 10.000

Coastal L. 10.000

Coastal L. 10.000

Approaches to Providence River from the Southward, Coaster L. E. bearing N. W. by N. E. about 14 Miles.

coves and small indentations. The principal of these are **Sheep Pen Cove**, about a mile and an eighth above **Pine Hill Point**; and **Coggeshall's Cove**, about a mile and three-eighths above the same point, and separated from Sheep Pen Cove by a low, flat, grassy point three hundred yards wide. Neither is of any importance,—there being only two or three feet in them at mean low water.

The land is all low to the northward of **Pine Hill** and has only one or two houses upon it.

North Point, or **North Point of Prudence** as it is sometimes called, is very low and flat, covered with grass, and has a single house upon it. A long shoal makes to the northward from this point,—ten feet at mean low water being found about eight hundred and fifty yards from shore;—and a striped buoy is placed on the northern end of this shoal a little over half a mile to the northward of the point. From this buoy to **Conanicut Point**, at the entrance to **Providence River**, the distance is two miles and a half.

Patience Island is a smooth grassy island about thirty feet high, a little over five-eighths of a mile long in a **N.** and **S.** direction, and half a mile wide in its widest part. It lies close in with the western shore of **Prudence Island**, opposite to **Coggeshall's** and **Sheep Pen** coves, and separated from the island by a passage nearly three hundred yards wide with seven feet at mean low water, but impracticable for strangers. The island has a very gentle slope on its eastern side, but its western face presents a steep cliff twenty feet in height; and dangerous sunken rocks lie off this side of the island, rendering a nearer approach than seven hundred yards unsafe. From the northwestern point of **Patience Island**, **Warwick Light-house** (on the northern side of the entrance to **Greenwich Bay**) bears **NW. $\frac{1}{2}$ N.**, five-eighths of a mile; **Conanicut Point Light-house** (at the entrance to **Providence River**) **NE. by N. $\frac{3}{4}$ N.**, three miles and a half; and the striped buoy on **Fort Rock** (off the northern end of **Prudence Island**) **NE. $\frac{1}{4}$ E.**, a mile and a quarter distant.

EASTERN PASSAGE OF NARRAGANSETT BAY.

As before mentioned, the entrance to this passage lies between **Brenton's Point** on the east and **Beaver Tail Point** on the west and is two miles wide. Thence it takes a course to the northeastward, between **The Neck** and the southeastern end of **Conanicut Island**, where it is only half a mile wide, with a strong current, very deep water and bold shores. Thence to the northward it leads between **Rhode Island** and **Conanicut**, where its greatest width is two miles and three-quarters; and then turning slightly to the northeastward it runs between **Rhode** and **Prudence** islands as far up as **Sand Point**, at which point it divides,—one passage leading to the northeastward, between **Bristol Neck** and the northern end of **Rhode Island**, into **Mount Hope Bay**; and the other to the northward, between **Popasquash Neck** and **Prudence Island**, to the mouth of **Providence River**. But vessels may, and often do, pass between the northern end of **Conanicut** and the southern end of **Prudence Island** and steer for **Warwick Neck**, passing to the eastward of **Hope Island** and joining the **Western Passage** just to the northward of that island.

On approaching the bay from the eastward, the most prominent object visible will be **Brenton's Reef Light-vessel**, which is anchored almost exactly in the middle of the entrance in fourteen and three-quarter fathoms, and about a mile **SW.** by **W. $\frac{1}{4}$ W.** from the southern end of **Brenton's Reef**. The vessel has two masts, with a circular cage day-mark at each masthead. The hull is painted straw-color, with the words "*Brenton's Reef*" in black letters on each side. Two white lights are shown from a height respectively of forty and fifty feet and visible twelve miles. A bell is rung and a horn sounded in thick weather. There is a good passage, with from twelve to fourteen fathoms in it, between the light-vessel and the red spar-buoy on the southern end of **Brenton's Reef**. The geographical position of this light-vessel is, (approximately,)

Latitude ----- 41° 25' 48" N.
Longitude ----- 71° 22' 45" W.,

and it bears from

	Miles.
Hen and Chickens Light-vessel, W. $\frac{1}{4}$ N. -----	16
Vineyard Sound Light-vessel, W. by N. $\frac{3}{4}$ N. -----	17 $\frac{1}{2}$
Cuttyhunk Light-house, W. by N. $\frac{1}{4}$ N. -----	19
Gay Head Light-house, W NW. -----	24 $\frac{1}{2}$
Davis' or New South Shoal Light-vessel, NW. by W. -----	76 $\frac{1}{2}$
Block Island Southeast Light-house, NE. $\frac{3}{4}$ N. -----	17 $\frac{1}{2}$
Block Island North Light-house, NE. $\frac{1}{4}$ E. -----	14 $\frac{1}{2}$
The black buoy on the northern end of Sandy Point Shoal, NE. $\frac{3}{4}$ E. -----	13 $\frac{1}{2}$
Point Judith Light-house, NE. by E. $\frac{1}{4}$ E. -----	6 $\frac{1}{2}$

From this light-vessel

	Miles.
Beaver Tail Light-house bears NW. by N. $\frac{1}{4}$ N. -----	1 $\frac{1}{2}$
The entrance to Mackerel Cove N. $\frac{1}{4}$ E. -----	2 $\frac{1}{2}$
Fort Dumpling NE. by N. $\frac{3}{4}$ N. -----	nearly 3
Castle Hill NE. by N. $\frac{1}{4}$ N. -----	1 $\frac{1}{4}$
Graves Point (the southern extremity of Brenton's Point) NE. $\frac{3}{4}$ E. -----	1 $\frac{1}{2}$

When with up the light-vessel the passage will be open to the northward as far as **Fort Dumpling**, which will appear as a low, circular, white tower, at the eastern end of a line of rugged rocky hillocks stretching across the passage from **Southwest Point** (the eastern point of entrance to **Mackerel Cove**) and overlapping the western extremity of **The Neck**,—thus apparently closing the passage.

Nearly in range with Fort Dumpling, but a little to the eastward of it, bearing about **NE. by N. $\frac{1}{4}$ N.**, will appear Castle Hill,—the westernmost extremity of Rhode Island. It is about twenty feet high, with a gentle slope, covered with grass, and is very easily recognized by the remarkable snow-white rocks at its western extremity. It is quite bold-to on its western side,—seven fathoms being found within one hundred yards of the rocks; but off its southern end there are dangerous bare and sunken rocks extending two hundred yards from the shore. It is intended to erect a fog-whistle upon this hill. Castle Hill is nearly three-quarters of a mile to the northward of **Graves Point**,—the land between them being of moderate height with a very gentle slope, and dotted with villas surrounded by ornamental grounds.

On the western side of the entrance Beaver Tail Light-house will be seen on the southern end of a long, smooth, grassy point, terminating in a low rocky head about twenty feet high. It will appear as a square, grey tower, surmounted by a black lantern and attached to a white dwelling. The gentle slopes of **The Beaver Tail** and of the eastern face of the peninsula will appear to the northeastward of the light-house, joining the line of rugged hillocks at the southeastern end of Conanicut.

At Castle Hill the passage turns to the eastward, running about **E NE.** between the western shore of **The Neck** and the southeastern end of Conanicut. The latter has been already described, (see pages 250–252.) The former is composed entirely of undulating lands of moderate height, with abrupt rocky faces, and occasional handsome houses on its summit. It terminates about a mile and a half above Castle Hill in a smooth, nearly level, grassy point, upon which is seen a large casemated fort of granite, surmounted in places by a parapet of earth with sodded traverses. This is **Fort Adams**, and marks the southern point of entrance to Newport Harbor. A large granite pier extends from the northern end of the point to the edge of the channel, a distance of a little over one hundred yards.

When abreast of Fort Dumpling there will be seen, a mile and five-eighths off, and bearing **NE. $\frac{1}{4}$ N.**, a low islet, with a grey dwelling, surmounted by a black lantern, on its southwestern end. The island is **Rose Island** and the house **Rose Island Light-house**,—one of the guides for the Eastern Passage. **Rose Island** is of irregular shape, three hundred and fifty yards wide at its southern end, and six hundred yards long in a **N. by E.** and **S. by W.** direction. At its northern end it is a mere strip of land about fifty yards wide, with many outlying rocks and sunken ledges on its northern, eastern and western sides. The remains of an old fortification of brick are seen just to the eastward of the light-house; but the rest of the island is covered only with grass. The light is shown from the keeper's dwelling, which is of wood painted a drab color, with brown trimmings, and has a mansard roof, on which is the tower and lantern. It is a fixed red light, of the sixth order, shown from a height of fifty-eight feet above the sea, visible eleven miles. Its geographical position is

Latitude ----- $41^{\circ} 29' 42''$ N.
Longitude ----- $71^{\circ} 20' 34''$ W.

It bears from

	Miles.
The western extremity of Castle Hill, NE. $\frac{1}{4}$ N. -----	2
Bull Point, (the southeastern extremity of Conanicut,) NE. $\frac{1}{4}$ N. -----	a little over 1
The end of the pier at Fort Adams, N. $\frac{1}{4}$ W. -----	$\frac{1}{2}$

From this light-house

	Miles.
Gould Island bears N. $\frac{1}{4}$ E. -----	2
The spindle on Half-Way Rock N. by E. $\frac{1}{4}$ E. -----	a little over 4
Prudence Island Light-house NE. by N. $\frac{1}{4}$ N. -----	$6\frac{1}{2}$
Goat Island Light-house (in Newport Harbor) E. by S. $\frac{1}{4}$ S. -----	nearly $\frac{1}{2}$

Rose Island is surrounded by shoal water but is tolerably bold-to near the light-house, where seven and a half fathoms may be found within one hundred and fifty yards of the shore. As a rule, however, it is best not to approach its western side nearer than two hundred and fifty yards; while the northern end should receive a berth to the southward of not less than six hundred yards; and the southern end a berth to the northward of not less than three hundred and fifty yards. The main channel of the Eastern Passage leads between Rose Island and the Conanicut shore; but there is also a passage with from five to eight fathoms between it and Coasters' Harbor Island, which is used by vessels bound into Newport from the northward. It is obstructed by dangerous ledges, lying in mid-channel; but these are well buoyed and the passage is perfectly safe.

On the western side of the passage, opposite to Fort Adams, on a bearing of **W. by N. $\frac{1}{4}$ N.**, is the rocky head forming the southeastern extremity of Conanicut and called Bull Point; and the group of rocky islets and bare rocks to the northeastward of it is known as **The Dumplings**. All of this part of the passage is unobstructed and has from ten to twenty-five fathoms water.

On passing Fort Adams the harbor and city of Newport will open on the eastern shore,—the harbor being formed by a cove of irregular shape indenting the western shore of Rhode Island. A low grassy island, with smooth and nearly level surface and its summit dotted with buildings, lies nearly in the middle of this cove and is called **Goat Island**. It is about nine hundred yards long in a **N. by E.** and **S. by W.** direction, and has an earth-work on its summit known as **Fort Wolcott**. The island is the site of the **Naval Torpedo Station**, to which the buildings on it belong.

From the northern end of Goat Island there extends a stone breakwater a little over four hundred yards long in a N. by E. $\frac{3}{4}$ E. direction, on the extremity of which stands a white dwelling with stone tower attached. This is Newport Harbor Light-house, sometimes called Goat Island Light-house, and is the guide to the northern entrance to that harbor. It shows a fixed white light, of the fourth order, from a height of thirty-three feet above the sea, visible eleven miles; and its geographical position is

Newport Harbor
Light-house.

Latitude ----- 41° 29' 34" N.
Longitude ----- 71° 19' 38" W.

It bears from

Beaver Tail Light-house, NE. by E. $\frac{1}{2}$ E. -----	a little over	Miles. 4 $\frac{1}{2}$
The western extremity of Castle Hill, NE. $\frac{3}{4}$ E. -----	a little over	2 $\frac{1}{2}$
Bull Point, E NE. -----	nearly	1 $\frac{1}{2}$

From this light-house the black buoy on Gull Rocks bears N. by W. $\frac{1}{4}$ W., fourteen hundred yards, and the red buoy on Bishop Rock N. $\frac{1}{4}$ W., a little over a mile and three-eighths distant.

When up with the northern end of Rose Island there will be seen to the northeastward, a little over three-quarters of a mile off and close in with the western shore of Rhode Island, a small island, with a large white house, surmounted by a circular cupola, near its southern end. This is Coasters' Harbor Island, marking the eastern side of the inshore channel into Newport from the northward. It is about five-eighths of a mile long in a N. by E. and S. by W. direction, has a very irregular surface and no trees. Its southern end extends into a long, low, level, grassy point, protected by a stone sea-wall; but the land gradually rises to the northward for about three hundred and fifty yards to the large white house above mentioned, where it attains a height of fifty feet, with a steep face on its western side. Thence it descends with a gentle incline to the northern end, where appear several round rocky hillocks about forty feet high. Coasters' Harbor lies on the northern side of this island, between it and Coddington Point; and anchorage may be found in it in from six to seven feet at low water; but there is no passage between this island and Rhode Island,—the two being connected by a causeway near the southern end of the former.

Coasters' Harbor
Island.

Coasters' Harbor.

Coddington Point is a grassy peninsula about forty feet high, gently sloping, and under cultivation. It is nearly a mile and a half to the northward of Newport Harbor Light-house and about three hundred and fifty yards from the northern end of Coasters' Harbor Island, and is shoal on its eastern side, where, near its northern end, lie the dangerous rocks called **The Sisters**, two hundred and fifty yards from shore; and off its southern end the sunken ledge called **Bishop Rock Shoal**, three hundred yards to the westward of Bishop Rock. Both of these dangers are marked by buoys. On its northern side makes in **Coddington Cove**, an excellent anchorage in southerly and easterly winds, with from three to five fathoms at low water.

Coddington Point.

Bishop Rock.

A little over two hundred yards to the westward of the southwestern end of Coddington Point lies a rocky islet, triangular in shape (with the base to the northward) and about twenty feet high, with a few trees on top. This is Bishop Rock, which lies about N. by E. and S. by W., is about one hundred and twenty yards long, and a little over fifty yards wide at its northern end. There is no passage between it and Coddington Point; nor should strangers attempt to pass through the narrow channel between it and Bishop Rock Shoal.

The western or Conanicut side of the passage has been already described (see page 252) as composed of undulating grassy land, varying in height from sixty to one hundred feet, and under fine cultivation. A mile and an eighth to the northward of Bull Point is the **Ferry Wharf**, used by the small steamers by means of which Newport communicates with the mainland to the westward. This wharf is directly opposite to Rose Island Light-house, bearing from it W. by N., distant about a mile, which is here the width of the passage. The village of **Jamestown**, back of this wharf, is quite a prominent landmark on that side.

Just to the northward of Ferry Wharf the land rises with a gentle slope to a hill sixty feet high, with an orchard on top. This is **Freebody's Hill**, and on its northern side makes in a small cove directly opposite to the entrance to Coasters' Harbor, called **Potter's Cove**, in which anchorage is found in from two to four fathoms, sticky bottom. All of this shore is quite bold-to.

Two miles to the northward of Rose Island Light-house, seven-eighths of a mile to the northwestward of Coddington Point, and three-quarters of a mile to the eastward of the Conanicut shore, lies a small island, with level grassy surface and precipitous sandy faces, called **Gould Island**. It is half a mile long in a N. $\frac{1}{2}$ E. and S. $\frac{1}{2}$ W. direction, with a width of an eighth of a mile, and is bold-to on all sides. On its summit is a group of houses, with a thick grove of trees extending from them nearly to the southern extremity. There is water sufficient for the largest vessels on either side of the island,—an unobstructed channel with not less than nine fathoms, and five-eighths of a mile wide, leading between it and Conanicut Island; and the main channel, five-eighths of a mile wide, with not less than twelve fathoms, leading between it and Coddington Point. The former is frequently used by vessels which intend to pass between Prudence and Hope islands towards Warwick Neck; while the latter is used by vessels bound to Fall River or up to Providence.

Gould Island.

In going up the main channel there will be seen a little to the northward of the course, and about a mile and five-eighths above Gould Island, a black spindle surmounted by a square cage. This is on **Half-Way Rock**, lying a little over seven-eighths of a mile from the southern end of Prudence Island,—a passage eleven hundred yards wide, with not less than four and a quarter fathoms, leading between the spindle and the southern end of the island.

Half-Way Rock.

When up with the spindle on Half-Way Rock, Dyer's Island will appear about a mile and a half to the northeastward and nearly in the middle of the passage. It is low, flat and sandy, lies nearly N. and S., is about seven hundred yards long and covered only with grass. There is no passage for large vessels between it and Carr's Point, (on Rhode Island,)—the best water which can be carried between them being but fifteen feet at low tide. The southern end of Dyer's Island is about eleven hundred yards N. by W. from Carr's Point, which is about three miles and an eighth above Coddington Point, and is low, flat and grassy, but backed by steep hills rising to a height of one hundred and sixty feet. Between Dyer's Island and the western shore of Rhode Island is an excellent anchorage with from six to eight fathoms, sticky bottom.

About a mile and a quarter above Carr's Point and a little over eight hundred yards to the northward of Dyer's Island is Coggeshall's Point, very low, flat, and covered with grass. Between six and seven hundred yards to the southward of it, and almost exactly opposite to the northern end of Dyer's Island, will appear a grove of handsome trees with a tall flag-staff rising from their midst. This is **Portsmouth Grove**, a celebrated watering-place on the line of the Old Colony and Newport Railroad.

A long ledge, with from six to seven feet water, extends in a northerly direction from Coggeshall's Point for eight hundred yards and is marked by a red spar-buoy; but this is the only obstruction in this part of the passage.

Nearly a mile and a quarter above the northern end of Dyer's Island and on the western side of the passage is Sand Point, on which is built the light-house known as Prudence Island Light-house, which will appear as a white tower standing on low land close to the eastern end of the point, with the keeper's dwelling some distance to the westward of it. (See page 252.) Here the hills on Prudence Island are quite steep, partly wooded, and rise to a height of one hundred and sixty feet.

The large wharf and warehouses at Coal Mine Point (see page 250) will be seen to the northeastward, about a mile and three-eighths distant, and on the southern side of the entrance to Mount Hope Bay,—the northern side of which is formed by Hog Island, a low island of very irregular shape and about five-eighths of a mile long in a N. and S. direction, lying in the middle of the entrance to Bristol Harbor and separating that entrance into two distinct channels. It is low, (being only twenty feet high in its highest part,) very gently sloping, grassy, and under cultivation; but is surrounded by shoals, which render it difficult to approach. The shoal off its southwestern end has a red spar-buoy marking the eastern side of the main channel, which is here only five-eighths of a mile wide with not less than four and a quarter fathoms.

Here the passage turns somewhat more to the northward, passing between Prudence Island on the west and Popasquash Neck (forming the western shores of Bristol Harbor) on the east. This neck, when viewed from the southward and westward, shows very gently sloping lands, composed of cleared and cultivated fields, rising to a height of forty feet. It lies nearly N. and S., is about two miles long, and bare of all trees except fruit trees. Its southern end is known as Popasquash Point and marks the northern point of the main entrance to Bristol; while its northern end, called North Point, forms the southern point of the entrance to Warren River.

The eastern shore of Prudence Island, about a mile and a quarter above Sand Point, takes a sudden turn nearly NW. and changes its character altogether,—becoming low, flat and grassy for nearly a mile and a quarter, to the eastern base of Pine Hill. (See page 252.) Between this hill and a low, flat, sandy point called Gull Point is formed a shallow cove, called Potter's Cove, in which anchorage may be found in from six to twelve feet. It is well, however, for vessels of large draught to give all of the eastern shore of the northern half of Prudence Island a berth to the westward of not less than eight hundred yards. Gull Point is nearly opposite to Popasquash Point,—bearing from it W. $\frac{1}{2}$ S., distant a mile and a half, which is here the width of the passage.

A little over seven-eighths of a mile above Gull Point, on the Prudence Island shore, is Bear Point, also low, nearly level and grassy; and about five-eighths of a mile to the northward of it is North Point, (see page 253,) the northern extremity of the island. Here the Eastern Passage is a mile and three-quarters wide, and here the two passages unite in one, continuing to the mouth of Providence River, three miles above.

On the eastern shore, a mile and a half above the North Point of Popasquash Neck, is Rumstick Point,—the northern point of entrance to Warren River and the southern end of Rumstick Neck, which is composed of low, nearly level, grassy lands, bare of trees and under fine cultivation. Rumstick Point is composed entirely of marsh and a long shoal makes to the southward from it for five-eighths of a mile with not more than nine feet water. From the northern end of the neck, which is about seven-eighths of a mile to the northward of the point, the shore turns abruptly to the westward, running about WNW. for a mile and three-eighths to Nayat Point, the eastern point of entrance to Providence River. The land is of the same general character,—being nearly level, cleared and cultivated.

On the western shore, when to the northward of North Point, on Prudence Island, the high, somewhat steep lands of Warwick Neck will appear, with the light-house on the southern end of the neck. This light-house is a peculiar looking white tower, attached to the southern end of the keeper's dwelling, which is also white with a red roof. To the northward are groups of houses peeping from among the trees, with which the surface of the neck is dotted in clumps; and the land is undulating, with somewhat steep slopes, and very shoal in its approaches.

A mile and five-eighths **NE.** by **N.** from the light-house will appear another remarkable white tower, rising above the trees, and surrounded by large houses. This is on **Rocky Point**, or **Rocky Neck** as it is sometimes called, one of the most famous of the summer resorts in the bay. The land is low and nearly level and is entirely occupied by the ornamental grounds surrounding the hotels. Thence the western shore runs **N. $\frac{1}{4}$ E.** for a mile and a quarter to the mouth of a small shallow creek of little importance, called **Old Mill Creek**.

Rocky Point.

PROVIDENCE RIVER.

From **Old Mill Creek** the western shore extends to the northeastward into a long, low, flat, grassy point called **Conimicut Point**, the western point of entrance to **Providence River**. A small dark-looking house stands on piles at its eastern extremity; and nearly half a mile to the eastward of this will be seen a grey tower with a white two-story dwelling-house attached,—both being built on a stone pier rising from the water.* This is **Conimicut Light-house**, and marks the eastern extremity of **Conimicut Point Shoal**, which extends from the point to the light-house and has two feet at mean low water. The light-house is a granite tower, fifty feet high, and shows a fixed white light of the fourth order, visible thirteen miles. The fog-signal is a **bell**, and is sounded in thick weather once every twelve seconds. The geographical position of the light-house is

Conimicut Point and Light-house.

Latitude	41° 43' 0" N.
Longitude	71° 20' 45" W.,

and it bears from

	Miles.
North Point of Popasquash Neck, NW. by N. $\frac{1}{4}$ N.	a little over 2 $\frac{1}{4}$
The striped buoy on Ohio Ledge, N. by W. $\frac{1}{4}$ W.	2 $\frac{1}{2}$
The striped buoy off North Point of Prudence Island, N. by E. $\frac{1}{4}$ E.	nearly 2 $\frac{1}{2}$
The northwestern point of Patience Island, NE. by N. $\frac{1}{4}$ N.	3 $\frac{1}{2}$
Rocky Point, NE. $\frac{1}{4}$ N.	nearly 1 $\frac{1}{4}$

This light-house marks the western side of the channel into **Providence River** and may be approached within twenty yards with four fathoms water. From it **Bullock's Point Light-house** bears **NNW. Westerly**, a mile and a half distant.

Nayat Point (the eastern point of entrance to the river) is about forty feet high, with a gentle slope towards the water, covered with grass and dotted with handsome houses and ornamental trees. On its eastern extremity stands a low, square, white tower, with a dwelling-house and outhouses on its western side. This was formerly the light-house marking the entrance to the river, but has been discontinued,—**Conimicut Light-house** having taken its place. **Nayat Point** is shoal and should not be approached nearer than five hundred yards. From off this point the steeples, the larger houses, and a remarkable large circular dome in the city of **Providence** are all visible.

Nayat Point.

From **Nayat Point** the eastern bank of the river runs nearly **N. by W. $\frac{1}{4}$ W.** for a mile and three-eighths to the entrance to **Bullock's Creek**,—a shallow stream running in a nearly **N. by E.** direction for a mile and three-eighths behind **Bullock's Neck**. The shore is flat, diversified with cleared fields, clumps of trees and ornamental grounds, and dotted with clusters of houses.

The southern end of **Bullock's Neck**, called **Bullock's Point**, is nearly a mile and a half above **Nayat Point** in a **NW. by N. $\frac{1}{4}$ N.** direction. It is also the western point of entrance to **Bullock's Creek**; and seen from the southward appears low, flat and sandy, with water-worn faces, and bare of trees. A single house will be seen on its southern extremity. All of this shore is shoal,—dangerous flats making off from a quarter to half a mile;—and it is dangerous, in approaching it, to stand farther to the eastward than **Bullock's Point Light-house** bearing **NW. by N.** From **Bullock's Point** a long shoal, nearly bare at mean low water, makes in a southwesterly direction for nearly half a mile; and on the extremity of this is built a light-house known as **Bullock's Point Light-house**. It is easily recognizable as a low tower of a drab color, rising from the centre of a one and a half story frame house of the same color, and will bear about **NNW.** from off **Conimicut Light-house**, distant about a mile and a half. The light is a fixed red, of the sixth order, is shown from a height of fifty feet above sea-level, and is visible eleven miles. Its geographical position is

Bullock's Point and Light-house.

Latitude	41° 44' 13" N.
Longitude	71° 21' 52" W.

From this light-house **Sabine's Point Light-house** bears **N. $\frac{1}{4}$ W.**, a little over a mile and a half distant.

The western bank of the river curves away abruptly from **Conimicut Point** to the westward and then to the northwestward, running into a large but shallow cove, called **Turtle Cove**,—the entrance to which is a mile and three-eighths above **Conimicut**. The shore between the point and the cove is low, with occasional water-worn faces, and nearly all under cultivation, although thick clumps of low trees are seen here and there. **Turtle Cove** is about four hundred and fifty yards wide at its mouth, but has only four feet of water and is of no importance. Its eastern point of entrance is formed by **Greene's Island**,—a small, low, sandy island with water-worn faces and grassy summit. It is connected with the mainland (from which it is distant about one hundred and seventy-five yards) by a narrow causeway, and it is surrounded by flats bare at low water.

Turtle Cove.

Three-quarters of a mile above the entrance to **Turtle Cove**, and a mile and seven-eighths to the northward of **Conimicut Point**, is **Gaspee Point**, long, low and sandy, with perpendicular faces, bare of trees and under cultivation. It is exactly opposite

*The dwelling and that part of the pier on which it stood were carried away by ice in the spring of 1875.

to Bullock's Point, on the eastern bank, and forms the southern point of entrance to a narrow and shallow cove called **Passequonquis** or **Mud Cove**. On the northern side of the entrance to this cove, and joined to the mainland at **Gaspee Point**, low water, is an islet about a quarter of a mile long but in no place over fifty yards wide, called **Rock Island**. It is quite low and flat, has a few trees upon it, and is very shoal in its approaches,—the whole of its eastern face as well as that of the neighboring shore being lined with oyster beds.

On the northern side of Rock Island begins the entrance to Pawtuxet Cove,—a long, narrow and shallow cove, into which enters the **Pawtuxet River**, and on the bank of which is built the village of **Pawtuxet**. The harbor is formed between the western bank and a sort of neck or peninsula lying nearly **N. by E.** and **S. by W.**, and joining the mainland at the northern end of the village. This peninsula is three-eighths of a mile long, bare of trees, but thickly dotted with houses.

Pawtuxet Cove. A low flat islet called **Marsh Island**, surrounded at low water by grass, lies about one hundred and seventy-five yards to the southward of the southern end of this neck, marking the southern side of the main entrance to the harbor;—a further guide being a circular white tower, looking like a light-house, placed on the edge of the flats four hundred yards to the eastward of Marsh Island, a little over six hundred yards to the northward of the northern end of Rock Island, nearly a mile due **N.** from Gaspee Point, and a mile and a half **N. by W.** $\frac{3}{4}$ **W.** from Bullock's Point Light-house. This tower is **Pawtuxet Beacon**, is surmounted by a black ball, and marks the western limits of the channel, which, between it and Sabine's Point Light-house, is a quarter of a mile wide with from three to six fathoms water.

The eastern bank of the river from Bullock's Point to Sabine's Point, a mile and three-eighths above, is of moderate height, shows occasional white sand bluffs, and is fringed with trees. It should not be approached inside of the line of the two light-houses on account of the flats lining this shore.

Sabine's Point is a bluff, yellow, sandy point dotted with houses,—conspicuous among which is a large hotel. A little above the pitch of the point a long wharf extends to the edge of the channel. Extensive oyster beds lie off the point, extending a little over three-eighths of a mile from shore; and on the extremity of this reef will be seen a slate-colored dwelling-house with mansard roof, surmounted by a low tower and lantern. This is Sabine's Point Light-house, and shows a fixed white light, of the sixth order, from a height of fifty-one feet above the sea, visible eleven miles. Its geographical position is

Latitude 41° 45' 42" N.
Longitude 71° 22' 32" W.,

and it bears from Bullock's Point Light-house **N. $\frac{3}{4}$ W.**, a little over a mile and a half, and from Gaspee Point **N. by E. $\frac{1}{4}$ E.**, a little over a mile distant. From this light-house Pomham Beacon bears **N. by E. $\frac{1}{4}$ E.**, seven-eighths of a mile distant. The channel passes to the westward of the light-house and is here only about three hundred and fifty yards wide between the lines of three fathoms.

The western shore of the river from the village of Pawtuxet to Field Point, nearly a mile and five-eighths above, is composed almost exclusively of undulating lands of moderate height, cleared and cultivated, and dotted with occasional clumps of trees.

Field Point is sandy and covered with grass, with precipitous faces, and extends off into a low flat point. The summit has a group of houses with a flag-staff in front, and at the base of the cliff will be seen a couple of trees and a group of small buildings. On the northern side of the point a long wharf is built out to the edge of the channel. All of this shore is shoal,—extensive flats occupying two-thirds of the width of the river. On the eastern edge of these flats, five-eighths of a mile to the northward of Sabine's Point, is built a cylindrical beacon of masonry, painted white, and surmounted by a staff and black ball. This is **Pomham Beacon**, and marks the western limits of the channel,—the line of best water passing a little over two hundred yards to the eastward of it.

Pomham Rocks Light-house. Pomham Rocks Light-house, four hundred yards to the eastward of the beacon, marks the eastern limits of the channel, and is visible from off Sabine's Point Light-house as a low tower on top of a wooden building, painted white, with a red mansard roof. It stands upon a high rock with perpendicular faces, about three hundred and fifty yards from the eastern bank of the river, and shows a fixed red light, of the sixth order, from a height of sixty-nine feet above the sea, visible eleven miles. Its geographical position is

Latitude 41° 46' 37" N.
Longitude 71° 22' 11" W.,

and it bears from Sabine's Point Light-house **NE. by N. $\frac{1}{4}$ N.**, a little over five-eighths of a mile distant. Fuller's Rock Light-house bears from this light-house **N. by W. $\frac{1}{4}$ W.**, a little over a mile distant. The channel here is only about two hundred yards wide and has from four to five fathoms in it. The eastern bank of the river in this vicinity has much the same height as the western bank, but with steeper faces, mostly rocky, and a surface diversified with groves of trees and ornamental grounds.

On the flats, about five-eighths of a mile to the northward of Pomham Beacon and nearly in mid-river, will be seen a low flat islet with a couple of white houses upon it surrounded by trees. This is **Starvegoat Island**, and should not be approached by large vessels nearer than six hundred yards. Directly opposite to it, and close in with the eastern bank of the river, is a large bare rock known as **Bulkhead Rock**; and four hundred and fifty yards to the northward of this, and a hundred yards from shore, lies **Whortleberry Island**,—a rocky islet with perpendicular

faces, surmounted by a group of houses and wooded with low trees. Nearly all of the eastern bank in its vicinity is composed of ornamental grounds, and the same is true of both shores as far up as the city.

Cranberry Island, also on the eastern side of the channel, lies about three hundred yards above Whortleberry Island and about a hundred yards from shore. It is low and flat and about a hundred yards long.

From abreast of Starvegoat Island, Fuller's Rock Light-house will appear, bearing about N. by W. $\frac{1}{4}$ W. and half a mile distant. It is directly opposite to Field Point, marks the eastern limits of the channel, and is about an eighth of a mile from the eastern bank. It will appear as a six-sided pyramidal wooden structure, painted white and supported by a circular granite pier; and shows a fixed white light, of the sixth order, from a height of twenty-eight feet above the sea, visible ten miles. Its geographical position is

**Fuller's Rock
Light-house.**

Latitude ----- 41° 47' 36'' N.
Longitude ----- 71° 22' 48'' W.,

and it bears from Pomham Rocks Light-house N. by W. $\frac{1}{4}$ W., a little over a mile distant. The channel, which is here two hundred yards wide, passes to the westward of the light-house with a depth of from three to six fathoms.

Two hundred yards to the northward of Fuller's Rock Light-house lies Kettle Point, a long, low, rocky point on the eastern bank, covered with grass but destitute of trees. It is the southern point of the entrance to a large but very shallow cove, called **Watchemoket Cove**, which here penetrates the eastern shore to a distance of nearly half a mile. It is nearly three-eighths of a mile wide at its mouth, but of such an irregular shape that its width in some places is less than one hundred yards; and access can be had to it only by a small draw in the causeway of the Providence, Warren and Bristol Railroad, which crosses its mouth.

Kettle Point.

The narrowest part of Providence River is between Kettle and Field points, where it is only about three hundred and fifty yards wide.

When abreast of Fuller's Rock Light-house, another light-house will be seen on the western shore, bearing about NW. $\frac{1}{4}$ N. and five-eighths of a mile distant. This is **Sassafras Point Light-house**, on **Sassafras Point**, a little over half a mile above Field Point, and about seven-eighths of a mile below the city. It is a six-sided wooden beacon, painted white, and supported by a circular stone pier. It shows a fixed red light, of the sixth order, from a height of twenty-five feet above the sea, visible ten miles; and its geographical position is

**Sassafras Point
Light-house.**

Latitude ----- 41° 47' 59'' N.
Longitude ----- 71° 23' 31'' W.

The shore between Field Point and this light-house is undulating, bare of trees, with occasional steep almost perpendicular faces, intersected by low, flat, grassy lands.

On the northern side of Sassafras Point makes in a shallow cove of irregular shape called **Old Maid's Cove**,—on the northern bank of which the suburbs of the city begin. Both shores of the river are shoal above Sassafras Point; but the limits of the channel are well marked by buoys. The city is built at the head of the river and extends its wharf-line not only over both banks of Providence River, but along the western shore of the **Seekonk River**, which separates it from **East Providence**. A bridge, crossing the Seekonk a little above its junction with the Providence, connects the two towns.

Providence is a city of about fifty thousand inhabitants and has important manufacturing interests.

DANGERS

IN ENTERING NARRAGANSETT BAY BY THE EASTERN PASSAGE AND PASSING UP TO PROVIDENCE.

A vessel approaching Narragansett Bay from the eastward will meet with no obstructions until nearly up with **Brenton's Reef Light-vessel**, when there will be seen about a mile to the northeastward of the latter a red spar-buoy. This is on **Brenton's Reef**, a long shoal making off to the southwestward from **Brenton's Point** for nearly half a mile. It is awash at low water near its southern end and has several half-tide ledges scattered along its length. The buoy is marked No. 2, placed in eighteen feet on the southern edge of the reef, and bears from

Brenton's Reef Light-vessel, NE. by E. $\frac{1}{4}$ E. -----	Miles.	1
Beaver Tail Light-house, E SE. -----		1 $\frac{3}{4}$
The southern extremity of Brenton's Point, SW. $\frac{1}{2}$ S. -----	nearly	$\frac{1}{2}$

Between the buoy and the light-vessel the passage is a mile wide, with a depth of from nine to fourteen fathoms, and perfectly safe at all times. The buoy should, however, receive a wide berth during the flood tide, which sets strongly on to the reef.

About five-eighths of a mile to the eastward of **Brenton's Reef** buoy, and nearly half a mile from shore, is a bare rock surrounded by shoal water and called **Seal Rock**. It is not in the way of vessels bound into the bay unless they are standing to the northward on a wind, in which case it may be avoided by going about as soon as **Brenton's Reef Light-vessel** bears W. by S.

When past the light-vessel and the buoy on Brenton's Reef, both shores are bold-to and may be approached within four hundred yards with not less than five fathoms; but if Beaver Tail Light-house be first made, it should not be approached from the southward nearer than six hundred yards to avoid Newton's Rock, a dangerous bare rock lying an eighth of a mile SW. by S. $\frac{1}{2}$ S. from the light-house and surrounded by shoal water. A can-buoy of the second class, painted red and black in horizontal stripes, is placed in five and a half fathoms about four hundred yards SW. from the rock, and bears from Brenton's Reef Light-vessel NW. $\frac{1}{4}$ N., a mile and three-eighths, and from Beaver Tail Light-house SE. $\frac{1}{2}$ S., six hundred yards distant.

About one hundred and fifty yards from the southern extremity of Castle Hill lies a small detached rock called Butter-Ball Rock. It is always out and is the first danger met with after passing Brenton's Reef, and may be avoided by not approaching the southern end of Castle Hill nearer than an eighth of a mile.

On the northern side of the passage, and about an eighth of a mile S. by E. $\frac{3}{4}$ E. from Southwest Point, at the entrance to Mackerel Cove, lies Kettle-Bottom Rock, a small rock, always out, about fifty yards long in a N NE. and S SW. direction. It is bold-to except at its northern end, where a shoal with from six to nine feet water extends in a N. by E. direction for one hundred and fifty yards, and there are several detached shoals, with from ten to fifteen feet at low water, between the rock and the southeastern end of Conanicut. It is therefore dangerous for vessels to pass either to the westward or the northward of the rock, although a channel with not less than five and a half fathoms exists between it and Conanicut.

To avoid Kettle-Bottom Rock vessels should not shut in Goat Island Light-house behind Fort Dumpling; or, in other words, should not stand to the northward of that light bearing NE. by E. $\frac{3}{4}$ E.

With Fort Dumpling bearing W. by N. the course turns more to the northward, and there will be seen on the western side of the passage, about an eighth of a mile N NE. from Bull Point, a cluster of rocky islets, always out, known as The Dumplings. They lie scattered over a surface about an eighth of a mile in diameter, with narrow channels with from eighteen feet to four and a half fathoms running among and between them. The easternmost and largest of the group bears from Bull Point NE., distant about an eighth of a mile. A narrow channel about one hundred yards wide, with three and a quarter fathoms in it, exists between these rocks and Bull Point.

The Dumplings are not in the way of vessels unless standing to the westward on a wind, in which case they may be easily avoided by not going to the westward of Rose Island Light-house bearing NE. $\frac{3}{4}$ N.

When past The Dumplings there will be seen to the eastward, bearing about NE. $\frac{1}{4}$ N. and three-quarters of a mile off, a granite structure surmounted by a spindle with cage on top. This is on the southern extremity of Rose Island Point, a narrow piece of shoal ground extending off to the southward from Rose Island for a distance of nearly two hundred yards with a depth of water upon it varying from two to eighteen feet. At the extreme southern end of the shoal only seven feet is found, and it is here that the spindle is placed. From Rose Island Light-house this spindle bears SE. $\frac{3}{4}$ S., three hundred and twenty-five yards, and from Goat Island Light-house (Newport Harbor) W. by N., nearly five-eighths of a mile distant. This shoal is not in the way of vessels unless they are beating to windward; in which case, to avoid it, they should not go to the eastward of Rose Island Light-house bearing N. by W. $\frac{3}{8}$ W.

With Rose Island Light-house bearing E. by S. $\frac{1}{2}$ S., distant about three hundred and seventy-five yards, there will be seen to the northeastward, about half a mile off, a red spar-buoy, and a little to the eastward of this another of the same color. These are on Rose Island North Shoal, an extensive piece of shoal ground making off from the northern end of Rose Island,—the northeastern extremity (on which there is nine and a half feet) being distant a little over a quarter of a mile.

A depth of from six to eighteen feet is found upon this shoal, with occasional shoal spots having on them five and eight feet. The westernmost buoy (and the first one met with) is placed on the northern end of the shoal in eighteen feet water, is marked No. 4, and bears from the northern extremity of Rose Island N. $\frac{3}{4}$ W., a little over an eighth of a mile, and from Rose Island Light-house N. by E. $\frac{1}{4}$ E., eight hundred and fifty yards distant. The easternmost buoy is placed on the northeastern end of the shoal in two fathoms, is marked No. 6, and bears from the westernmost buoy E. by N. $\frac{3}{8}$ N., four hundred yards distant. Between these two buoys a channel about two hundred yards wide, with eighteen feet at mean low water, exists; but it is of course unfit for strangers.

To avoid Rose Island North Shoal (as well as the shoal ground making off to the westward from the island for about one hundred and fifty yards with from twelve to eighteen feet water) vessels should be careful not to go to the eastward of Rose Island Light-house bearing S. $\frac{3}{4}$ W.

About four hundred yards NE. $\frac{3}{4}$ N. from the red buoy on the northeastern end of Rose Island North Shoal lies a detached shoal spot with seventeen feet at mean low water upon it. It is not in the way and is easily avoided by not standing to the eastward of the red buoy above mentioned bearing SW. $\frac{1}{4}$ W. Between this shoal spot and the buoy there is a channel about three hundred and fifty yards wide with a depth of seven and three-quarter fathoms in it.

When past Rose Island North Shoal there will be seen well to the eastward, bearing about **NE. $\frac{1}{4}$ N.**, a can-buoy,* painted red, while to the northeastward of this and nearly in range with it will be seen a red spar-buoy. The first mentioned is on Bishop Rock Shoal, a small detached shoal spot having only eight and a half feet upon it at mean low water and distant from Bishop Rock a little over three hundred yards. The buoy is a can of the second class, marked No. 8, placed off the southwestern end of the shoal in three fathoms water, and bears from the red spar-buoy on the northeastern end of Rose Island North Shoal **N NE.**, a little over three-quarters of a mile, and from the southeastern extremity of Gould Island **S. by E. $\frac{2}{3}$ E.**, nearly seven-eighths of a mile distant. Between the shoal and Bishop Rock exists a channel a little over an eighth of a mile wide with five fathoms.

*Bishop Rock
Shoal.*

Bishop Rock Shoal is not in the way of vessels using this passage unless they are standing to the eastward on a wind, in which case, to avoid it, they should not go farther to the eastward than Rose Island Light-house bearing **SW. by S. $\frac{1}{8}$ S.**

The red spar-buoy to the northeastward of Bishop Rock Shoal is on The Sisters, a small detached rocky shoal lying on the edge of the eighteen feet curve, about an eighth of a mile from Coddington Point, and bare at low spring tides. The buoy is marked No. 10, placed in eighteen feet off the western side of the shoal, and bears from the red can-buoy* on Bishop Rock Shoal **NE. $\frac{1}{2}$ N.**, three-eighths of a mile, and from the southeastern extremity of Gould Island **SE. $\frac{1}{8}$ E.**, three-quarters of a mile distant. This shoal lies a little over half a mile from the sailing-line and is not, therefore, in the way of vessels using this passage unless they are beating to windward. In such case, to avoid it Coddington Point should not be approached nearer than three hundred and fifty yards. This rule should be strictly adhered to,—the water shoaling abruptly from thirteen and a half fathoms to eighteen feet.

The Sisters.

From abreast of the buoy on The Sisters the course turns more to the northeastward, and there are no dangers met with until you are well past Gould Island.

Half-Way Rock is the first danger met with after passing Gould Island, and lies about half a mile to the westward of the sailing-line. It is a large bare rock, bold-to, with the exception of its northern side, from which extends in a **N. by E. $\frac{1}{4}$ E.** direction for three hundred and seventy-five yards a narrow spit with from twelve to fifteen feet water upon it. An iron spindle, painted black and surmounted by a square cage, is built upon the dry part of the rock and marks the southern extremity of the shoal. This spindle bears from the southern end of Prudence Island **SW. $\frac{7}{8}$ W.**, a little over seven-eighths of a mile, and from the northern end of Gould Island **NE. by N. $\frac{3}{8}$ N.**, a little over a mile and five-eighths distant.

Half-Way Rock.

Vessels, to avoid Half-Way Rock at night, should not shut in Prudence Island Light-house behind the southeastern extremity of the island; or, in other words, should not go to the westward of that light-house bearing **NE. by N. $\frac{1}{4}$ N.**

When past Half-Way Rock spindle there will be seen to the northeastward, bearing about **NE. by E. $\frac{1}{4}$ E.**, a red spar-buoy. This is on the southern extremity of Dyer's Island Shoal, an extensive shoal surrounding Dyer's Island, and making off to the southward for a distance of seven hundred yards with soundings upon it varying from three to ten feet. A number of sunken rocks and rocks awash at low water lie scattered over its surface to the eastward of the buoy. The buoy is marked No. 12, placed in eighteen feet just outside the shoal, and bears from the southwestern extremity of Dyer's Island **SW. $\frac{3}{4}$ S.**, seven hundred yards, and from the spindle on Half-Way Rock **E. by N. $\frac{3}{4}$ N.**, a little over a mile and three-eighths distant.

*Dyer's Island
Shoal.*

A little over five-eighths of a mile above the red buoy on the southern extremity of Dyer's Island Shoal there was formerly placed another spar-buoy, also painted red. This marked the northern end of the same shoal and was in three fathoms water. It bore from the buoy on the southern end of the shoal **NE. by N. $\frac{3}{4}$ N.**, a little over five-eighths of a mile, and from Prudence Island Light-house **S. $\frac{1}{4}$ W.**, a little over a mile and an eighth distant.†

To avoid Dyer's Island Shoal vessels should not, when beating, stand farther to the eastward than Prudence Island Light-house bearing **N. by E. $\frac{1}{4}$ E.** when in the vicinity of the southernmost buoy; above this and between the northern and southern ends of the shoal it is dangerous to go to the eastward of the same light-house bearing **N. $\frac{7}{8}$ E.** until past the northern end of the shoal.

Between the southern extremity of Dyer's Island Shoal and Carr's Point there exists a channel about four hundred yards wide with a depth of from fifteen to seventeen feet in it at mean low water. It affords an easy and safe passage into the anchorage between Dyer's Island and the mainland; but is rarely used except by those who are well acquainted.

When past the buoy on the northern end of Dyer's Island Shoal, a red spar-buoy will be seen well to the eastward, bearing about **NE. by E. $\frac{3}{4}$ E.** This is on Coggeshall's Ledge, the northern extremity of a long rocky shoal making off to the northward from Coggeshall's Point for a little over three-eighths of a mile with depths upon it varying from six to twelve feet. The buoy is marked No. 16, placed in fifteen feet water on the extreme

*Coggeshall's
Ledge.*

† Gone in 1880.

northern end of the shoal, and bears from the northern extremity of Dyer's Island Shoal **NE. $\frac{1}{2}$ E.**, nearly a mile, and from Prudence Island Light-house **SE. $\frac{1}{2}$ E.**, about seven-eighths of a mile distant.

Coggeshall's Ledge is not in the way of vessels using this passage,—the sailing-line passing close along the eastern face of Prudence Island. Should a vessel be beating, it is only necessary, in order to avoid this shoal, not to shut in Bristol Ferry Light-house (on the northern point of entrance to Mount Hope Bay) behind Coal Mine Point.

When abreast of Prudence Island Light-house, having it bearing **NW. by W. $\frac{1}{2}$ W.** and a quarter of a mile distant, the course turns more to the northward,—running about **N. $\frac{1}{4}$ E.** On this course there will be seen on the eastern side of the passage, well in with Coal Mine Point, a **Coal Mine Rock.** red spar-buoy. This is on Coal Mine Rock, a small detached rocky shoal lying on the edge of the eighteen feet curve, about a quarter of a mile from shore, and having only eight feet at mean low water upon it. The buoy is placed on the western side of the shoal in fifteen feet, hard bottom, is marked No. 18, and bears from Prudence Island Light-house **E. by N. $\frac{1}{4}$ N.**, nearly a mile and three-eighths, and from the red buoy on the southwestern end of Hog Island Shoal **SE. by S. $\frac{3}{4}$ S.**, a little over a mile distant.

In beating, vessels, to avoid Coal Mine Rock, should not approach the eastern shore nearer than three hundred yards,—the water shoaling abruptly.

When about a mile and a quarter above Prudence Island Light-house a red spar-buoy will be seen on the eastern side of the passage, nearly in range with the southwestern point of Hog Island. This marks the southwestern extremity of Hog Island Shoal, an extensive shoal making off from Hog Island to a distance of nearly nine hundred yards with an average width of about three-eighths of a mile. It has soundings upon it varying from three to eighteen feet,—eleven feet being found just inside the buoy. The buoy is marked No. 20, placed in eighteen feet, and bears from

Prudence Island Light-house, NE. by N. $\frac{3}{8}$ N. -----	a little over	1 $\frac{5}{8}$ miles.
Southwest Point, SW. $\frac{5}{8}$ W. -----		850 yds.
The buoy on Coal Mine Rock, NW. by N. $\frac{3}{4}$ N. -----	a little over	1 mile.

It is dangerous when in this vicinity for vessels to stand farther to the eastward than Prudence Island Light-house bearing **SW. by S. $\frac{3}{8}$ S.**, or more to the northward than Muscle Bed Shoals Light-house (on the southern point of entrance to Mount Hope Bay) bearing **E. $\frac{3}{8}$ N.**

On the western side of the channel, nearly opposite to the red buoy on Hog Island Shoal, will be seen a black spar-buoy. This is on Mount Tom Rock, bare at low spring tides, with a depth of from twelve to fourteen feet on all sides of it, and distant from shore a little over an eighth of a mile. The buoy is marked No. 9, placed in seventeen feet just to the northward of the rock, and bears from the red buoy on Hog Island Shoal **W. by N. $\frac{1}{2}$ N.**, about a mile, and from Popasquash Point **SW. $\frac{1}{4}$ S.**, a little over a mile and an eighth distant.

When about a mile and a half above Prudence Island Light-house it is dangerous to approach the eastern face of Prudence Island nearer than six hundred yards,—a depth of only eighteen feet being found at that distance from it. This rule holds good as far up as North Point of Prudence for vessels which are beating to windward; but, otherwise, it does not affect them,—the course passing close along the western shore of Popasquash Neck, leaving the main portion of the channel to the westward.

When in the vicinity of Popasquash Point vessels should not approach it from the southward and westward nearer than three hundred yards, as the water shoals abruptly from four fathoms to fourteen feet. There is a black spar-buoy on the southern extremity of the shoal making off from this point, intended as a guide for vessels going up to Bristol. It is marked No. 1 and placed in twelve feet at low water, bearing from the southwestern point of Hog Island **NW. by N. Northerly**, three-quarters of a mile, and from the red buoy off that point **N. $\frac{1}{2}$ W.**, nearly one mile distant.

When a little over a mile above Popasquash Point there will be seen to the westward of the course, bearing about **NW. by W. $\frac{1}{4}$ W.**, and distant a little over a mile and three-quarters, a spar-buoy painted red and black in horizontal stripes. This is on Fort Rock, the northern extremity of a long shoal making off from North Point to the northward for a distance of over half a mile with depths upon it varying from five to fifteen feet. It has an average width of over four hundred yards, and is not in the way of vessels using the Eastern Passage unless they are standing well to the westward on a wind. The buoy, as before mentioned, is placed on the northern extremity of the shoal in fifteen feet at mean low water, and marks the junction of the Eastern Passage with the Western Passage. It bears from North Point of Prudence Island **N.**, half a mile, and from the northern extremity of Popasquash Neck **W.**, distant two miles, which is here the width of the channel.

With North Point of Prudence Island bearing **W. $\frac{1}{4}$ N.**, the course turns more to the westward, and there will be seen nearly ahead, bearing about **NW. by N. $\frac{1}{4}$ N.**, and distant nearly seven-eighths of a mile, a can-buoy* painted red and black in horizontal stripes. This is on Ohio Ledge, a small detached rocky shoal about three hundred yards long and two hundred yards wide with a depth of

from eight to eleven feet upon it. The buoy is a can of the second class, placed on the southern extremity of the ledge in twelve feet water, and may be passed on either side by vessels drawing not over fifteen feet. It bears from the buoy on Fort Rock **E. $\frac{1}{2}$ N.**, nearly a mile and an eighth, and from the northern point of Popasquash Neck **W. $\frac{1}{2}$ N.**, a little over seven-eighths of a mile distant. From Ohio Ledge there extends to the northward and westward, toward Conimicut Point, *an extensive and irregularly shaped patch of shoal ground* with a depth of water upon it varying from fifteen to eighteen feet. The sailing-line crosses the northeastern extremity of this shoal and carries not less than seventeen feet water. **Ohio Ledge.**

After passing Ohio Ledge the horizontally striped buoy on Rumstick Shoal will appear well to the northeastward, bearing about **NE.** by **E. $\frac{1}{8}$ E.** Rumstick Shoal makes off to the southward from Rumstick Neck for five-eighths of a mile with an average width of seven hundred and fifty yards, and has depths upon it varying from two to twelve feet. A quarter of a mile to the southward of the neck, near the western edge of the shoal, lie two large bare rocks, distant from each other one hundred and fifty yards. The easternmost and smaller of the two is called **Rumstick Rock**; while the westernmost and larger is known as **Long Ledge**. Rumstick Shoal buoy is a spar, painted red and black in horizontal stripes, placed in twelve feet on the southeastern extremity of the shoal, and is intended as a guide for vessels entering Warren River. It bears from the buoy on Ohio Ledge **NE. $\frac{3}{8}$ E.**, nearly a mile and three-eighths, and from the southern end of Rumstick Neck **S.** by **W. $\frac{1}{8}$ W.**, a little over half a mile distant. In beating to windward, vessels, in order to avoid this shoal, should not stand to the eastward of Conimicut Point Light-house bearing **NW. $\frac{1}{4}$ N.** **Rumstick Shoal.**

About seven-eighths of a mile to the northward of Ohio Ledge buoy a black nun-buoy* will be seen on the western side of the channel. This is on Conimicut Middle Ground, which is part of the extensive area of shoal ground making off to the eastward from the mainland for a distance of over one mile with soundings upon it varying from two to eighteen feet, and with *a number of sunken rocks and rocks awash at low water* scattered over its surface. The buoy is a nun of the second class, marked No. 11, placed on the eastern side of the shoal in sixteen feet, and bears from Conimicut Point Light-house **S. $\frac{3}{8}$ W.**, a little over three-quarters of a mile, and from the horizontally striped buoy on Rumstick Shoal **NW.** by **W. $\frac{3}{8}$ W.**, about a mile and three-quarters distant. **Conimicut Middle Ground.**

From Rumstick Neck and the mainland to the northward and westward of it shoal water extends out for three-quarters of a mile,—depths of from fifteen to eighteen feet being found at that distance from shore. Vessels must, therefore, when in this vicinity be careful how they approach this shore.

A little over three-quarters of a mile above the black nun-buoy on Conimicut Middle Ground is Conimicut Point Light-house, on Conimicut Point Shoal, making off from Conimicut Point for nine hundred yards with only two feet upon it at mean low water. The light-house is built upon its eastern extremity, marks the western edge of the channel into Providence River, and may be safely approached within fifty yards with a depth of not less than four fathoms. **Conimicut Point Shoal.**

Opposite to Conimicut Point Light-house, on the eastern side of the channel, to the southward of Nayat Point, will be seen a red spar-buoy, marked No. 22. This is on Nayat Point Shoal, making off from the point to the southward for six hundred and fifty yards with a depth of from five to twelve feet at mean low water. A number of bare rocks and rocks awash at low water lie along its length. The buoy is placed upon the extreme southern end of the shoal in three fathoms, and bears from Nayat Point **S.** by **W. $\frac{3}{4}$ W.**, a little over six hundred yards, and from Conimicut Point Light-house **NE.** by **E. $\frac{1}{2}$ E.**, distant six hundred yards, which is here the width of the channel between the lines of three fathoms. **Nayat Point Shoal.**

When past Conimicut Point Light-house and the buoy on Nayat Point Shoal you are fairly in Providence River; but no stranger should attempt to pass beyond this without a pilot. Not more than fourteen feet at low water can be taken up to Providence.

From the entrance as far up as a line between Gaspee Point and Bullock's Point both sides of Providence River are shoal,—extensive flats making off to a distance of about half a mile from either shore with depths varying from one to eighteen feet,—leaving an available channel of an average width of only six hundred yards, but with a depth of water in it varying from three and a half to eight fathoms.

When past Conimicut Point Light-house there will be seen on the western side of the channel, bearing about **NW. $\frac{3}{8}$ W.**, a black spar-buoy. This is on Greene's Island Flats, making off from Greene's Island to the southward and eastward for three-eighths of a mile, with only one foot at mean low water and awash in places at low spring tides. The buoy is placed on the eastern extremity of the flats in ten feet water, hard bottom, is marked No. 1, and bears from Conimicut Point Light-house **NW.**, nearly a mile and three-eighths, and from Bullock's Point Light-house **SW. $\frac{3}{8}$ S.**, a little over half a mile distant. The sailing-line passes well to the eastward of it. **Greene's Island Flats.**

Bullock's Point Shoal is an extensive shoal making off to the southwestward from Bullock's Point, and is part of the great mass of flats making off from the eastern shore of the river. It has a depth of only three feet at a distance of seven hundred yards from the point, and its southwestern extremity is marked by Bullock's Point Light-house, built on the edge of the eighteen feet curve and defining the eastern side of the channel. Under no circumstances should vessels attempt to pass between the light-house and the point.

Bullock's Point Shoal. When up with Bullock's Point Light-house a black spar-buoy will be seen off Gaspee Point. This is on Gaspee Point Shoal, a narrow sand-spit making off from the point for about three hundred yards and dry at mean low water. The buoy is placed on its eastern extremity in ten feet, is marked No. 3, and bears from Bullock's Point Light-house **NW.** by **N. $\frac{5}{8}$ N.**, five-eighths of a mile distant.

Gaspee Point Shoal. When up with this buoy there will be seen ahead, and a little to the westward of the course, another black spar-buoy. This is on Seal Rock Flats, making off from the western side of the river for a quarter of a mile, with sunken rocks and oyster beds scattered over their surface. **Seal Rock Flats.** The buoy is marked No. 5, placed in twelve feet just to the eastward of a line of oyster beds, and bears from the buoy on Gaspee Point Shoal **N. $\frac{3}{8}$ W.**, nearly five-eighths of a mile, and from Sabine's Point Light-house **S.** by **W. $\frac{3}{8}$ W.**, eight hundred and fifty yards distant. Here the channel is contracted (between the lines of three fathoms) to a width of three hundred and fifty yards by the extensive flats making off from the eastern shore of the river between Bullock's Point and Sabine's Point.

Just above the buoy on Seal Rock Flats will be seen a white stone tower surmounted by a black ball. This is **Pawtuxet Beacon**, built upon a *two feet spot* just inside the eighteen feet curve, and is intended as a guide for vessels entering Pawtuxet Harbor. It also enables vessels to avoid the flats making off from the western shore of the river.

Directly opposite to Pawtuxet Beacon, on the eastern side of the channel, is Sabine's Point Light-house, marking the southern extremity of Sabine's Point Shoal, a long shoal making off from Sabine's Point for about three-eighths of a mile with from two to five feet upon it, and extensive oyster beds extending along its whole length. The light-house is built upon the edge of the shoal and marks the eastern edge of the channel. Here the channel curves away to the northeastward for about five-eighths of a mile; then turns gradually to the northwestward, running in that direction as far up as Sassafras Point Light-house with an average width of one hundred and twenty-five yards and a depth of water in it varying from three and a half to seven and a half fathoms.

About four hundred and fifty yards above Sabine's Point Light-house, and on the eastern side of the channel, will be seen a red spar-buoy. This is on Sabine's Flats, making off to the westward from Sabine's Point with a depth of from one to twelve feet upon them. **Sabine's Flats.** The buoy is marked No. 2, placed in eleven feet on the western edge of the flats, and bears from Sabine's Point **W.** by **N. $\frac{1}{8}$ N.**, a quarter of a mile distant.

On the western side of the channel, a little above the buoy on Sabine's Flats, will be seen the black spar-buoy on Great Bed Shoal. This is an extensive shoal making off to the eastward from the western shore for a little over three-quarters of a mile, occupying almost the entire width of the river. It is a mass of oyster beds, sunken rocks and dry flats, and has in no place more than ten feet at mean low water. The buoy is a black spar, marked No. 7, placed in twelve feet on the southeastern extremity of the shoal, and bears from Sabine's Point Light-house **NE. $\frac{5}{8}$ E.**, eight hundred and fifty yards distant. When past this buoy a white stone tower, surmounted by a vane and black ball, will be seen ahead and a little to the westward of Pomham Rocks Light-house. This is **Pomham Beacon**, built upon a *three feet spot* about two hundred yards from the western limits of the channel.

On the eastern side of the channel, nearly opposite Pomham Beacon, will be seen Pomham Rocks Light-house, built upon a *high bare rock* lying on the edge of the eighteen feet curve, about three hundred yards from shore, and defining the eastern border of the channel. Above it, and distant about six hundred and seventy-five yards, will be seen a black spar-buoy. This is on Starvegoat Island Flats, making off from Starvegoat Island to the eastward for three-eighths of a mile and forming part of the extensive Great Bed Shoal. The buoy is placed on the southeastern extremity of the flats in twelve feet and is marked No. 9,—the sailing-line passing to the eastward of it.

Just above the buoy on Starvegoat Island Flats, on the eastern side of the channel, will be seen a can-buoy* painted red and black in horizontal stripes. This is on Bulkhead Rock Shoal, a detached shoal spot, with ten feet at mean low water, lying exactly on the edge of the channel and distant from the shore about two hundred and twenty-five yards. The buoy is placed on the western side of the shoal and the sailing-line passes to the westward of it. Seven hundred yards above this buoy, on the western side of the channel, will be seen the black spar-buoy on Oyster Bed Flats, making off to the southeastward from Field Point

and also forming part of Great Bed Shoal. A depth of from one to ten feet at mean low water is found upon these flats. The buoy is marked No. 11, placed in twelve feet, soft bottom, and marks the western edge of the channel.

*Oyster Bed
Flats.*

Opposite to Oyster Bed Flats buoy, on the eastern side of the channel, will be seen a red spar-buoy, marked No. 4. This is on Lovett's Rock, awash at mean low water, and distant from the southern end of Cranberry Island about sixty yards. The buoy is placed off its southwestern side in fifteen feet water and the sailing-line passes to the westward of it.

Lovett's Rock.

From Lovett's Rock buoy the course leads towards Fuller's Rock Light-house, on the eastern side of the channel, opposite Field Point. The light-house is built on a large bare rock lying about three hundred and fifty yards inside the eighteen feet curve, and distant from shore a little over nine hundred yards. Vessels should not attempt to go inside this light-house,—the space between it and the shore being occupied by bare rocks, sunken ledges, and extensive oyster beds.

Between Field Point and Sassafras Point the channel runs close along the western shore,—its limits, however, being much contracted by Long Point Shoal, making off from the eastern bank for six hundred yards and having only four feet upon it at mean low water. A red spar buoy, marked No. 6, is placed on its western extremity in fourteen feet, and bears from Sassafras Point Light-house **SE. $\frac{1}{2}$ E.**, a little over three hundred yards distant. The sailing-line passes to the westward of it.

*Long Point
Shoal.*

On the western side of the river, just above Long Point Shoal buoy, is Sassafras Point Light-house, built upon the northeastern extremity of a sand-spit, dry at low water, which makes off from Sassafras Point for about eight hundred yards, marking the western side of the channel.

Above Sassafras Point Light-house the extensive Lyon's Flats occupy the entire width of the river,—extending from shore to shore, leaving an available channel of only one hundred and twenty-five yards in width with from fourteen to eighteen feet in it. The outlines of the channel are well defined by buoys and no detailed description of it is necessary,—no stranger being able to venture up thus far without a pilot.

Lyon's Flats.

Vessels wishing to pass through the drawbridges at East Providence and to proceed up the Seekonk River to Pawtucket must take a tow-boat,—the channel being narrow and tortuous, with a depth of only five feet at mean low water. The channel has been well buoyed, however,—principally for the convenience of the tow-boats.

SAILING DIRECTIONS

FOR ENTERING NARRAGANSETT BAY BY THE EASTERN PASSAGE AND PASSING UP TO PROVIDENCE.

Vessels which have come outside of Nantucket Shoals and are bound for Narragansett Bay should, when on the course **NW.** by **W. $\frac{1}{2}$ W.** from Davis' South Shoal Light-vessel, bring the western end of No Man's Land to bear **NE. $\frac{3}{4}$ N.**, about four miles and seven-eighths distant, in thirteen fathoms water, and steer **NW.**; which course will lead, with not less than thirteen fathoms, up to Brenton's Reef Light-vessel. Or, *having come through Nantucket and Vineyard Sounds* and intending to enter the bay, vessels on the **W.** by **S. $\frac{3}{8}$ S.** course through Vineyard Sound should bring Vineyard Sound Light-vessel to bear **NW. $\frac{3}{4}$ W.**, about two miles distant, and steer **WNW.**; which course will lead, with not less than eleven fathoms, up to the light-vessel, as before. *If bound from Buzzard's Bay, Hen and Chickens Light-vessel* should be brought to bear **E. $\frac{1}{2}$ S.**; and **W. $\frac{1}{2}$ N.** will lead, with not less than six fathoms, up to the light-vessel.

From Brenton's Reef Light-vessel the entrance to the Eastern Passage will be open, and **NE.** by **N. $\frac{1}{2}$ N.** should be steered, carrying not less than thirteen and a half fathoms, until past Castle Hill; when Goat Island Light-house will bear **NE.** by **E. $\frac{1}{4}$ E.** and should be steered for, carrying not less than twenty fathoms, until abreast of Bull Point, with Fort Dumpling bearing **W.** by **N. $\frac{1}{2}$ N.**, six hundred and fifty yards distant, and Rose Island Light-house **NE.** by **N. $\frac{5}{8}$ N.**, a mile and a quarter distant. Here the depth will be twenty-three fathoms and **N.** by **E. $\frac{3}{4}$ E.** will lead nearly for the southeastern end of Gould Island, passing to the westward of Rose Island Light-house and carrying not less than fifteen fathoms water. This course should be continued until the southern end of Gould Island bears **W.** by **N. $\frac{3}{8}$ N.**, three hundred yards distant, and Prudence Island Light-house **NE.** by **N. $\frac{3}{4}$ N.**, nearly four miles and seven-eighths distant. At this point the depth is seventeen fathoms and the course **NE.** by **N. $\frac{1}{2}$ N.**, leading about midway up the passage, and carrying not less than eleven fathoms water, until Prudence Island Light-house bears **NW.** by **W. $\frac{5}{8}$ W.**, a quarter of a mile distant. Here the depth is fourteen fathoms and the course **N. $\frac{1}{4}$ E.**, leading close along the eastern shore of Prudence Island, crossing the channel, and continuing along the western face of Popasquash Neck, carry-

Sailing Directions--Eastern Passage. ing not less than four fathoms. On this course, when North Point of Prudence Island bears $W. \frac{1}{8} N.$, about a mile and a half distant, and Conimicut Point Light-house $N.$ by $W. \frac{5}{8} W.$, a little over three miles and an eighth distant, the depth will be seven and a half fathoms and the course $N.$ by $W. \frac{3}{8} W.$, passing to the eastward of the horizontally striped buoy on Ohio Ledge, and crossing the northeastern end of the shoal to the northward of the buoy in seventeen feet water. This course should be continued until Conimicut Point Light-house bears $NW. \frac{1}{8} N.$, half a mile distant, when $NW.$ by $N. \frac{3}{8} N.$ will lead into the river and as far up as Bullock's Point Light-house, carrying not less than three and three-quarter fathoms, until the light-house bears $NE.$ by $E. \frac{3}{4} E.$, about two hundred and twenty-five yards distant. Here the depth is five and a half fathoms and the course $N.$ by $W. \frac{1}{4} W.$, carrying not less than three and a half fathoms, until Sabine's Point Light-house bears $SE.$ by $E. \frac{1}{8} E.$, two hundred and fifty yards distant, when the depth will be five and a half fathoms and the course $NE. \frac{3}{8} N.$, carrying not less than three and a half fathoms, until Pomham Rocks Light-house bears $N.$ by $E. \frac{2}{8} E.$ and Pomham Beacon $N.$ by $W. \frac{3}{8} W.$. Here the depth is four fathoms and the course $N.$ by $E.$, passing close along the eastern edge of Great Bed Shoal and leading directly for the horizontally striped buoy on Bulkhead Rock Shoal. It is of vital necessity that this latter course should be made good to avoid being set on Great Bed Shoal, and for this purpose a range with Bulkhead Rock Shoal buoy will suffice. When within one hundred and twenty-five yards of the above-mentioned buoy, a $N.$ by $W.$ course for Kettle Point will lead up the channel, passing about midway between the black buoy on Oyster Bed Flats and the red buoy on Lovett's Rock and carrying not less than five fathoms water. When past these buoys, Sassafra Point Light-house should be brought to bear $NW. \frac{1}{2} N.$ and steered for, carrying not less than three fathoms, until within three hundred yards of it and just abreast the red buoy on Long Point Shoal. Thence the course is $NNW.$ for a little over half a mile, and then $N. \frac{3}{8} E.$ for six hundred yards, crossing the flats in fourteen feet at mean low water. Above Sassafra Point the channel is extremely narrow and unsafe. Sailing vessels usually take a tow-boat to their berths at the wharves.

The above courses pass about five-eighths of a mile to the westward of Brenton's Reef buoy; nearly a mile and a quarter to the eastward of Beaver Tail Light-house; six hundred yards to the westward of Butter-Ball Rock; a quarter of a mile to the westward of the northern end of Castle Hill; nine hundred yards to the eastward of Kettle-Bottom Rock; three hundred yards to the eastward of the easternmost of The Dumplings; three hundred and seventy-five yards to the westward of Rose Island Light-house; three hundred and twenty-five yards to the westward of the red buoy on the northwestern end of Rose Island North Shoal; three-eighths of a mile to the westward of the red buoy on Bishop Rock Shoal; a little over half a mile to the westward of the red buoy on The Sisters; three hundred yards to the eastward of the southern end of Gould Island; half a mile to the eastward of the spindle on Half-Way Rock; a little over three-eighths of a mile to the westward of the red buoy on the southwestern extremity of Dyer's Island Shoal, and six hundred yards to the westward of the northern end of the same shoal; about five-eighths of a mile to the westward of the red buoy on Coggeshall's Ledge; a quarter of a mile to the eastward of Prudence Island Light-house; a little over one mile to the westward of the red buoy on Coal Mine Rock; a little over half a mile to the westward of the red buoy on the southwestern extremity of Hog Island Shoal; eight hundred and fifty yards to the eastward of the black buoy on Mount Tom Rock; six hundred and fifty yards to the westward of Popasquash Point; nearly a quarter of a mile to the eastward of Ohio Ledge buoy; a little over five-eighths of a mile to the westward of the southwestern extremity of Rumstick Shoal; six hundred yards to the eastward of the black buoy on Conimicut Middle Ground; about sixty yards to the eastward of Conimicut Point Light-house; a little over a quarter of a mile to the westward of the red buoy on Nayat Point Shoal; a little over three-eighths of a mile to the eastward of the black buoy on Greene's Island Flats; about two hundred yards to the westward of Bullock's Point Light-house; the same distance to the eastward of the black buoy on Gaspee Point Shoal; about two hundred and fifty yards to the eastward of the black buoy on Seal Rock Flats; an eighth of a mile to the eastward of Pawtuxet Beacon; two hundred and twenty-five yards to the westward of Sabine's Point Light-house; about seventy-five yards to the eastward of the black buoy on the southeastern extremity of Great Bed Shoal; a little over one hundred and fifty yards to the westward of Pomham Rocks Light-house; about fifty yards to the eastward of the black buoy on Starve-

goat Island Flats; midway between the black buoy on Oyster Bed Flats and the red buoy on Lovett's Rock; one hundred and fifty yards to the westward of Fuller's Rock Light-house; and one hundred yards to the eastward of Sassafras Point Light-house. *Sailing Directions--Eastern Passage.*

Or, if it is desired to go up the Middle Passage, between Conanicut and Prudence Islands, the N. by E. $\frac{3}{4}$ E. course from off Bull Point should be continued past Gould Island, carrying not less than seven and a quarter fathoms, until the northern extremity of the island bears SW. by W. $\frac{1}{2}$ W., nearly half a mile distant, and Warwick Light-house N. $\frac{1}{2}$ W.; when this latter course should be steered, carrying not less than seventeen feet water, until within seven hundred yards of the light-house, after which the directions for the Western Passage must be followed.

The *Middle Passage* is perfectly safe for strangers,—it being only necessary to avoid the shoal making off to the northeastward from Hope Island for three hundred and fifty yards. The sailing-line passes about one hundred and seventy-five yards to the eastward of the eastern extremity of this shoal and carries not less than three and a quarter fathoms until within about two miles of Warwick Light-house, where it crosses the western extremity of a detached patch of shoal ground in seventeen feet, as before mentioned. Above this, and as far up as its junction with the Western Passage, the sailing-line carries not less than three and a half fathoms.

On the above courses, to enter Newport Harbor by the Southern Channel.—The NE. by E. $\frac{1}{4}$ E. course for Goat Island Light-house should be continued until Rose Island Light-house bears N. $\frac{1}{8}$ W. and Lime Rock Light-house (south side of the harbor) SE.; when the latter course should be steered, following the directions given for the harbor.

To enter Newport Harbor by the Northern or Main Channel.—On the course NE. by E. $\frac{1}{4}$ E. for Goat Island Light-house, when Rose Island Light-house bears NE. by N. $\frac{1}{2}$ N., you will have twenty-three fathoms and Bull Point will be just abaft the port beam,—its northeastern end bearing NW. Northerly, a quarter of a mile distant. Now steer NE. $\frac{3}{8}$ E., which course will lead directly for the red spar-buoy on St. Patrick's Rock and you will have not less than five fathoms. On this course, when Goat Island Light-house bears S. by E. $\frac{1}{4}$ E., about three hundred yards, and Rose Island Light-house W. $\frac{5}{8}$ N., a little over five-eighths of a mile distant, you will have between four and five fathoms and must steer to the westward, towards the upper end of the city, (say about E. $\frac{3}{4}$ S.,) until Goat Island Light-house bears SW. by W., about three hundred yards distant, when steer to the southward, following the directions given for this passage.

On the above courses, to enter Mount Hope Bay.—On the NE. by N. $\frac{1}{8}$ N. course from off the southern end of Gould Island, when Prudence Island Light-house bears NW. by W. $\frac{1}{2}$ W., about five hundred yards distant, the depth will be fourteen fathoms and the course NE. $\frac{1}{2}$ E., which will lead, with not less than five and a quarter fathoms, up to the entrance; after which the directions given for the bay should be followed.

On the above courses, to enter Bristol Harbor by the Eastern Channel.—With Prudence Island Light-house bearing NW. by W. $\frac{1}{2}$ W., about a quarter of a mile distant, the course is NE. $\frac{1}{2}$ E., carrying not less than five and a quarter fathoms, until Bristol Ferry Light-house bears NE. $\frac{7}{8}$ N. and Muscle-Bed Shoals Light-house NE. by E. $\frac{3}{4}$ E. From this point the course is N. $\frac{1}{4}$ W., following the directions given for the harbor.

To enter Bristol Harbor by the Western Channel.—With Prudence Island Light-house bearing NW. by W. $\frac{1}{2}$ W., about a quarter of a mile distant, as before, the course is N. by E. $\frac{1}{2}$ E., carrying not less than three and a half fathoms, until Popasquash Point bears W. by N. $\frac{1}{4}$ N. and the northern end of Hog Island E. by S. $\frac{5}{8}$ S. Here the depth will be three and three-quarter fathoms and NE. $\frac{1}{2}$ N. will lead into the harbor, following the directions for this channel, given hereafter.

On the above courses, to enter Warren River.—The N. $\frac{1}{4}$ E. course from off Prudence Island Light-house should be continued until North Point of Prudence Island bears W. $\frac{1}{8}$ N. and Conanicut Point Light-house N. by W. $\frac{5}{8}$ W., carrying not less than four fathoms. Hence the course is NE. by N. $\frac{1}{4}$ N., following the directions given for the river.

On the above courses, to enter Wickford Harbor.—On the N. $\frac{1}{2}$ W. course through the Middle Passage, when North Point of Conanicut Island bears W. $\frac{1}{4}$ S. and the southern extremity of Prudence Island is in range with the southern end of Dyer's Island, the depth will be five fathoms

Sailing Directions--East-Passage. and the course $W. \frac{3}{8} N.$ for Poplar Point Light-house, (on the southern point of entrance to the Inner Harbor,) until abreast of North Point, with the southern end of Hope Island bearing $N. \frac{3}{8} E.$ Here the depth is between three and a half and four fathoms, and $W. \frac{1}{2} S.$ will lead, with not less than three and a quarter fathoms, up to the black buoy on James' Ledge, passing about three hundred yards to the southward of it. Poplar Point Light-house will now bear $W. by N. \frac{1}{2} N.$ and should be steered for, carrying not less than thirteen feet, until within eight hundred yards of it, when $NW. \frac{1}{8} N.$ will lead into the entrance, following the directions given for the harbor.

On the above courses, to enter Greenwich Harbor.—The $N. \frac{1}{2} W.$ course through the Middle Passage for Warwick Light-house should be continued until within about four hundred and fifty yards of it, carrying not less than seventeen feet water. Here the depth will be five fathoms and the course $NW. \frac{3}{4} W.,$ following the directions given for the harbor.

WESTERN PASSAGE OF NARRAGANSETT BAY.

The most conspicuous object visible to vessels approaching this bay from the westward will be Point Judith Light-house, on Point Judith, the southern extremity of Point Judith Neck as well as the western point of entrance to Narragansett Bay.

Point Judith and Light-house. Seen from the southwestward it will appear as a long, low, grassy point, bare of trees, under cultivation, with steep sandy faces and somewhat undulating in outline. It is dangerous to approach it from the southward and westward nearer than four hundred yards,—a depth of only three and a half fathoms being found at that distance from it. On the southeastern extremity of Point Judith is built Point Judith Light-house, a white stone tower, connected with the keeper's dwelling, and showing a flashing white light, (flashing once every fifteen seconds,) of the fourth order of Fresnel, from a height of sixty-seven feet above the sea, visible fourteen miles. Its geographical position is

Latitude $41^{\circ} 21' 38'' N.$
Longitude $71^{\circ} 28' 54'' W.$

Near the light will be seen a small house containing the fog-trumpet, a first-order steam-siren, giving blasts of six seconds at intervals of forty seconds during foggy weather.

Point Judith Light-house bears from

	Miles.
Watch Hill Light-house, (Eastern Entrance to Fisher's Island Sound,) $E. \frac{1}{2} N.$	a little over $17 \frac{1}{2}$
Little Gull Island Light-house, (Eastern Entrance to Long Island Sound,) $E. \frac{3}{4} N.$	about 30
Gardiner's Island Light-house, $E. by N. \frac{1}{2} N.$	a little over 33
Montauk Point Light-house, $NE. \frac{1}{4} E.$	about $24 \frac{1}{2}$
Block Island North Light-house, $NE. \frac{1}{2} N.$	a little over 9 $\frac{1}{2}$
Block Island Southeast Light-house, $N NE.$	13 $\frac{1}{2}$
Davis' South Shoal Light-vessel, $NW. by W. \frac{1}{2} W.$	79 $\frac{1}{2}$
Gay Head Light-house, $W. \frac{1}{2} N.$	29 $\frac{1}{2}$
Vineyard Sound Light-vessel, $W. \frac{1}{2} N.$	22 $\frac{1}{2}$
Outtyhunk Light-house, $W. Northerly$	24 $\frac{1}{2}$
Hen and Chickens Light-vessel, $W. \frac{1}{2} E.$	nearly 21 $\frac{1}{2}$

From this light-house Brenton's Reef Light-vessel bears $NE. by E. \frac{1}{2} E.,$ a little over six and an eighth miles, and Beaver Tail Light-house $NE. Northerly,$ six and three-eighths miles distant.

From Point Judith the eastern shore of Point Judith Neck has a general direction $NE. by N. \frac{1}{2} N.$ for a little over five miles to the mouth of Narrow or Pettaquamscot River, a narrow stream, almost dry at mean low water, and of no importance. The land is of moderate height, mostly cleared and richly cultivated, with a very gently sloping surface, and dotted with houses. The small settlement situated on this shore about four miles above Point Judith is Narragansett Pier, built on a curve or bend in the shore-line on low, gently rising land, and noted as a watering-place and summer resort. Anchorage may be found along this shore during heavy westerly winds in from three and a half to ten fathoms, but the holding-ground is not good.

It is dangerous for strangers to approach the eastern shore of Point Judith Neck nearer than three-eighths of a mile until about two miles and a quarter above Point Judith Light-house, when it may be safely approached within two hundred yards (as far up as Narragansett Pier) with not less than from four to six fathoms.

After passing Point Judith Light-house the first prominent object seen will be Beaver Tail Light-house, on Beaver Tail Point, the extreme southern end of Conanicut Island and the eastern point of entrance to the Western Passage. On approaching this point from the southward it will appear as a long, smooth, bare and gently sloping grassy point, backed by higher lands showing occasional groves of trees. Between it and the mainland to the westward lies the Beaver Tail Point, by higher lands showing occasional groves of trees. Between it and the mainland to the westward lies the entrance to the Western Passage, which is here a little over a mile and an eighth wide with a depth of from six to ten fathoms. Thence it runs to the northward between the western shore of Conanicut Island on the east and the mainland of Rhode Island on the west, and has an average width of about three-quarters of a mile as far up as Dutch Island. Beyond this it gradually widens until between North Point on the east and Quonset Point on the west, where it joins the main portion of the bay and is nearly two miles wide, with from three and a half to five fathoms water.

Beaver Tail Light-house is built on the extreme southern end of Beaver Tail Point, and is a square granite tower, attached to the keeper's dwelling, which is painted white. It shows a fixed white light, of the third order, from a height of sixty-eight feet above the sea, visible thirteen miles, and serves as a guide to the Eastern as well as the Western Passage of Narragansett Bay. Its geographical position is

Beaver Tail Light-house.

Latitude ----- 41° 26' 56" N.
 Longitude ----- 71° 23' 59" W.,

and it bears as follows: From

	Miles.
Point Judith Light-house, NE. $\frac{1}{2}$ N. -----	6 $\frac{1}{2}$
The black buoy on the northern end of Sandy Point Shoal, (the northern extremity of Block Island,) NE. $\frac{1}{2}$ N. Nearly -----	14 $\frac{1}{2}$
Block Island North Light-house, NE. $\frac{1}{2}$ N. -----	15 $\frac{1}{2}$
Block Island Southeast Light-house, NE. by N. $\frac{1}{2}$ N. -----	18 $\frac{1}{2}$
Brenton's Reef Light-vessel, NW. by N. $\frac{3}{4}$ N. -----	nearly 1 $\frac{1}{2}$
Hen and Chickens Light-vessel, W. by N. -----	15 $\frac{1}{2}$
Cuttyhunk Light-house, W. by N. $\frac{1}{2}$ N. -----	19 $\frac{1}{2}$
Vineyard Sound Light-vessel, W NW. -----	18 $\frac{1}{2}$
Gay Head Light-house, NW. by W. $\frac{3}{4}$ W. -----	25 $\frac{1}{2}$
Davis' South Shoal Light-vessel, NW. $\frac{1}{2}$ W. -----	77 $\frac{1}{2}$

From this light-house Dutch Island Light-house bears N. $\frac{1}{2}$ E., nearly two and seven-eighths miles distant.

A first-class Daboll fog-trumpet, giving blasts of six seconds at alternate intervals of ten and fifty seconds, is placed close to the light-house.

Well to the eastward of Beaver Tail Light-house will be seen Brenton's Reef Light-vessel, anchored in fourteen and three-quarter fathoms a little over a mile SW. $\frac{3}{4}$ W. from the southern end of Brenton's Reef, (see page 259.) The light-vessel has two masts, is painted straw-color, has a circular cage-work day-mark at each mast-head, and shows two white reflector lights from heights respectively of forty and fifty feet, visible twelve miles. A bell and horn are sounded on this vessel during thick or foggy weather.

Brenton's Reef Light-vessel.

From Beaver Tail Light-house to Beaver Head, two miles and five-eighths above, the western shore of Conanicut has a general course about N. by E. and shows rocky faces, backed by a smooth grassy surface. About a mile to the northward of the light-house makes in a small shallow cove, called Austin's Hollow, which affords anchorage in from one to two fathoms, soft bottom. Both above and below this cove the shore is bold to and may be safely approached within two hundred yards.

Austin's Hollow.

Beaver Head is the northwestern extremity of The Beaver Tail, (as the peculiarly shaped peninsula at the southwestern end of Conanicut is called,) and is about thirty-feet high, with precipitous rocky faces, and a nearly level summit composed entirely of rich grass land.

Beaver Head is also the southern point of entrance to an excellent harbor, known as Dutch Island Harbor, which makes into the western shore of Conanicut Island to the eastward of Dutch Island, affording commodious anchorage in from two to eight fathoms, sticky bottom, and may be entered either by passing to the northward or southward of Dutch Island,—the latter channel, however, being most commonly used, as it carries not less than six fathoms and is perfectly safe. The shores of the harbor are composed mostly of cleared and cultivated fields rising with a very gentle slope to the higher lands beyond, and showing occasional groves of trees.

Dutch Island Harbor.

Opposite to Beaver Head, distant about six hundred yards, will be seen Dutch Island Light-house, on the southern extremity of Dutch Island, both being visible to vessels when off Narragansett Pier. The island is of irregular shape, about five-eighths of a mile long in a N. by E. and S. by W. direction, and seven hundred yards wide in its widest part. It is about sixty feet high, smooth, grassy and gently sloping, and under cultivation except at its summit, where there is a large earthwork and a number of houses near it forming the barracks and laborers' quarters,—giving it the appearance of a large settlement. From the southern end of Dutch Island a long low point makes off, forming the site of Dutch Island Light-house, which will be seen to the westward of Beaver Tail Light-house just before entering the passage, and will appear as a square brick tower, painted white, and attached to the keeper's dwelling, which is whitewashed. It shows a fixed white light, of the fourth order, from a height of fifty-six feet above the sea, visible thirteen miles. Its geographical position is

Dutch Island and Light-house.

Latitude ----- 41° 29' 46" N.
 Longitude ----- 71° 24' 16" W.

A fog-bell struck by machinery is attached to this light-house, and is sounded at intervals of fifteen seconds during thick weather.

Dutch Island Light-house bears from Beaver Tail Light-house N. $\frac{1}{2}$ E., nearly two miles and seven-eighths, and from the wharf at South Ferry E. $\frac{1}{2}$ N. Nearly, a little over three-quarters of a mile, which is here the width of the passage. From this light-house the black nun-buoy on Plum Beach Shoal (seen ahead) bears N. by E., one mile and seven-eighths, and the black spar-buoy on Fox Island Shoal N. $\frac{1}{2}$ E. Nearly, three and a half miles distant.

The western side of the passage, from the mouth of Pettaquamscot River to Watson's Point, has a general direction about N NE. for one mile and a quarter, and will appear as land of moderate height, mostly cleared and cultivated, with a very gently sloping surface, and dotted with houses. The shore is faced with rocks, is very shoal, and should not be

Watson's Point. approached nearer than four hundred yards. Watson's Point is a smooth gently sloping point, faced with rocks, about forty feet high at its highest part, and is composed entirely of grass land except what is under cultivation. It is also the southern point of entrance to a large semicircular cove called **Wesqueag Cove**, in which good anchorage is found in from two to four fathoms, soft bottom.

The northern point of entrance to this cove is known as **Bonnet Point**, and is distant from Watson's Point a little over five-eighths of a mile in a NE. by N. $\frac{1}{2}$ N. direction. It is a steep, grassy headland with precipitous rocky faces from twenty to forty feet high, and has a very peculiar-looking long white rock, about ten feet high, off its southern end. The point is tolerably bold-to and may be approached within two hundred yards with not less than three fathoms.

One and three-eighths miles above Bonnet Point, on the western shore and directly opposite **Beaver Head**, is a small settlement known as **South Ferry**,—the western terminus of the line of ferries and stages connecting Newport with the mainland. It is easily recognized by the houses standing on the shore and slopes back of it,—prominent among which will be seen a church with a very tall steeple, situated on the summit of the hill, which is here about one hundred and twenty feet high and somewhat steep. All of the land is cleared and finely cultivated,—as are in fact all of the shores of Narragansett Bay. Above South Ferry the land rises gradually, and is composed of cleared fields dotted with houses, orchards and groves of trees.

One and an eighth miles above South Ferry is another small settlement known as **North Ferry**, situated on the flat shore at the base of the hills, with a long wharf extending out into the bay. The shore between this and South Ferry is bold and clean and good anchorage may be found along its length in from three to five fathoms.

The Conanicut shore, on the eastern side of the passage, above Dutch Island Harbor, (see page 251,) is composed mostly of cleared and cultivated lands rising with a very gentle slope to the summit of the island, which is from one hundred to one hundred and forty feet high. Nearly all of the land is cleared, as before mentioned; but there are occasional clumps of trees on the slopes and single trees here and there. This shore is foul and much obstructed by dangerous ledges,—the most extensive of which is called **Great Ledge**, and extends along the shore for about two miles at distances varying from seventy-five to two hundred and fifty yards. This shore should not, therefore, be approached nearer than three hundred yards by vessels drawing twelve feet and less; and all other vessels, when beating, should go about at once as soon as they strike four fathoms.

A little over three miles above Dutch Island Harbor is **Sand Point**, a low, flat, nearly level point, and exceedingly dangerous of approach,—shoal water making off to the northward and westward from it for an eighth of a mile. About one hundred and fifty yards to the northward of the point and nearly the same distance from shore lies a sunken ledge, with five feet at mean low water, called **Hull's Ledge**.

From Sand Point the shore runs about NE. $\frac{1}{4}$ N. for one mile to **North Point**, the northern extremity of Conanicut Island. It is a level grassy point, about twenty feet high, bare of trees and inclosed by fences,—the land back of it having a gentle slope and rising gradually to a height of one hundred feet. The point is pretty bold-to, has no outlying ledges, and may be safely approached within three hundred yards with not less than three fathoms. A wide channel with from three to five fathoms leads between North Point and Hope Island (one and three-eighths miles to the northward) into the Middle Passage, which connects the Eastern with the Western Passage.

On the western side, about one and a quarter miles above the settlement of North Ferry, a *long shoal* makes out nearly to the middle of the passage with only fourteen feet at mean low water upon it. A black nun-buoy marks the eastern limits of this shoal, and vessels, unless of light draught, should not attempt to go inside of it. The shores are steeper and more rocky, rising gradually, with occasional thick groves of low trees. Here the village of **Wickford** becomes visible in a deep bight in the western shore; and a small low island, with a few trees near its centre, will be nearly in range with it. This is **Fox Island**, lying about half a mile from shore and surrounded on all sides by many bare and sunken ledges.

When between Sand Point and Fox Island, Wickford Harbor will be well open. It is a wide cove, making in between Quonset Point on the north and Wild Goose Point on the south, and between these two points is a little over **Wickford Harbor**. two miles wide; but rapidly diminishes in width until at Poplar Point (where the Inner Harbor begins) it is less than three-eighths of a mile wide. Many ledges and sunken rocks lie along and extend off both shores; but most of them are buoyed.

Wild Goose Point, the southern point of entrance to Wickford Harbor, is a low rocky point, covered with grass, and has a grove of low bushy trees upon it,—its summit rising to a height of about twenty feet and perfectly bare. The point is shoal and must not be approached by vessels drawing twelve feet nearer than two hundred and fifty yards. Vessels drawing over twelve feet should not approach it more closely than five hundred yards; but the lead will be the best guide, as the soundings decrease very gradually. The best channel into Wickford Harbor is between this point and **James' Ledge**, (which will be easily recognized by the black nun-buoy on it,) and has a width of about three-quarters of a mile with a depth of not less than fourteen feet at mean low water as far up as Poplar Point, at the entrance to the **Inner Harbor**.

Quonset Point, the northern point of entrance to the harbor and the eastern extremity of a long low peninsula forming its northern side, is a very low sandy point, backed by low, cleared, flat, grassy lands, interspersed with occasional clumps of trees and dotted with houses. It is dangerous to approach this point nearer than four hundred yards,—a depth of only twelve feet being found at a distance of three hundred yards from it. **Quonset Point.**

Poplar Point, the southern point of entrance to the **Inner Harbor of Wickford**, is easily recognized by **Poplar Point Lighthouse**, built on its eastern extremity. The light is shown from the keeper's dwelling, (which is whitewashed,) and is a fixed white light, of the fifth order, shown from a height of fifty-one feet above the sea, visible thirteen miles. Its geographical position is

Latitude ----- 41° 34' 14" N.
 Longitude ----- 71° 26' 22" W.,

and it bears from

	Miles.
The centre of Fox Island, NW. by N. $\frac{1}{4}$ N. -----	1 $\frac{3}{8}$
North Point, W. $\frac{3}{8}$ N. -----	about 3
The black nun-buoy on James' Ledge, W. $\frac{1}{4}$ N. -----	nearly 1 $\frac{1}{2}$

When abreast of Sand Point, Hope Island will be seen a little to the eastward, (nearly in the middle of the passage,) and will appear as of moderate height, being about forty feet high, with a gentle slope, and has a single house on its summit. It is rocky and almost barren,—the surface being covered with outcropping ledges, with only a few small trees here and there,—thus giving the island a peculiarly desolate appearance. Off its southern end, and distant about one hundred and fifty yards, lies a high bare rock surrounded by dangerous sunken ledges, called **Round Rock**. Off its western side, also distant about one hundred and fifty yards, lies a small, round, rocky islet called **Gooseberry Island**, and about one hundred yards to the southward of this is a large bare rock known as **Seal Rock**. An eighth of a mile to the northeastward of the northern end of the island lies another bare rocky islet, surrounded by ledges dry at low water, called **Despair Island**. **Hope Island.**

To the eastward of Hope Island will be seen the cleared, cultivated and grassy lands of Prudence Island, forming the eastern boundary of this passage. Here the bay, between Quonset Point and the southern end of Prudence Island, is about three miles and a half wide with depths ranging from three and a quarter to six fathoms. The southern end of Prudence Island lies two miles due E. from North Point, and between these two points leads the **Middle Passage of Narragansett Bay**,—a wide and commodious channel, entirely unobstructed, connecting the Eastern and Western passages.

When up with North Point the light-house on Warwick Neck will be seen ahead about six miles off, and will appear as a tall white tower on the summit of a steep perpendicular bluff forty feet high, behind which the land rises to a height of one hundred and fifty feet. The wide opening to the westward of it is Greenwich Bay, and the villages seen on the western side of this opening are East Greenwich and Apponaug. To the eastward of Warwick Light-house is the opening leading into the Eastern Passage, and here the two passages unite and thence proceed together to Conimicut Point, the western point of entrance to Providence River, three and three-eighths miles above.

The western shore of the passage from Quonset Point to Pojack Point, four miles and a half above, is low, flat and grassy, interspersed with occasional groves of trees. The shore-line is very irregular,—being much indented with coves and small shallow streams of no importance, and is shoal in its approaches. Vessels drawing over six feet water should not approach it nearer than nine hundred yards until nearly up with Pojack Point, where it may be approached within three-eighths of a mile.

Prudence Island, which forms the eastern side of this passage, (see pages 252-253,) partakes of the same general character as Conanicut,—the land on the southern half of the island rising very evenly and gradually to a height of about one hundred and sixty feet, showing cleared, cultivated and grassy lands, with occasional clumps of trees, and the summit crowned with farm buildings and orchards. The southern point of the island is low, nearly flat and grassy, **Prudence Island.** with a few low trees on its extremity. This half of the island is joined to the northern part by a narrow strip of low, flat, marshy and grassy land, which takes a NW. direction, nearly at right angles to the higher parts of the island, for a mile and a quarter to Pine Hill Point. Thus is formed a large cove in which good anchorage is found in three and a half fathoms, sticky bottom, and perfectly unobstructed,—there being nothing in the way except **Pine Hill Ledge** and **Johnson's Ledge**, off Pine Hill Point.

Pine Hill Point is the southern extremity of the high hill at the northern end of Prudence Island known as **Pine Hill**. This hill is about eighty feet high, with a very gradual rise, smooth and grassy and under cultivation. The point itself is grassy, nearly level, with precipitous sandy faces about twenty feet high.

From the above description of Prudence Island it is easy to perceive that when viewed from the eastward or westward it will look like two islands or hills connected by a low isthmus. Vessels drawing over sixteen feet cannot go above Pine Hill Point without a fair wind, or unless the tide is up, as the channel is very narrow between the three-fathom lines and nearly all of the upper part of the bay is occupied by a large shoal with from fourteen to eighteen feet water upon it.

From Pine Hill Point to North Point, (the northern end of Prudence Island,) two miles and an eighth above, the land is all low and flat and much cut up with coves, the largest of which, **Coggeshall's** and **Sheep Pen** coves, being very shallow and of no importance.

North Point, or **North Point of Prudence** as it is sometimes called, is very low, flat and grassy, and entirely bare of trees. It is quite shoal in its approaches,—ten feet at mean low water being found nearly half a mile to the northward of it, and vessels should be careful, when in its vicinity, to go about as soon as they strike four fathoms, as it shoals very abruptly.

Pojack Point, on the western shore, is the southern point of entrance to **Potowomut River**, a narrow, shallow stream, with about three feet at mean low water, making in to the westward between **Marsh Point** on the north and **Pojack Point** on the south; and between the two it is about five hundred and fifty yards wide.

Pojack Point also forms the southern point of entrance to **Greenwich Bay**, which here makes in to the northwestward, between **Potowomut Neck** on the south and **Warwick Neck** on the north, for about three and an eighth miles, and at its entrance is a little over a mile and a half wide. The villages of **Apponaug** and **East Greenwich** are built upon its shores, the first mentioned being situated in the northwestern corner of the bay and the latter in the southwestern corner. Ten feet at mean low water can be carried up to the western end of the bay and the same depth may be taken to the anchorage off **East Greenwich**; but the channel through the bay is much obstructed by rocks and ledges and the best water is found under **Warwick Neck**. Nearly in the middle of the entrance to the bay will be seen an iron spindle surmounted by a square wooden cage. This is on **Warwick** or **Spindle Rock**, and is surrounded on all sides by dry rocks and sunken ledges.

Warwick Point, the southern extremity of **Warwick Neck** and the site of **Warwick Light-house**, is about forty feet high, and seen from the southward shows precipitous faces. To the eastward and northward groups of houses appear among the trees with which the neck is dotted in groves; and still farther to the northward the land appears thickly wooded, and there will be seen a tall, peculiar-looking white tower rising above the trees. This is on **Rocky Point**, about a mile and five-eighths above; and a number of large houses seen near the tower are the summer hotels at this point. The highest land on **Warwick Neck**, back of the point, is about one hundred and forty feet high, with orchards and ornamental trees dotting the surface in clumps.

Warwick Light-house, situated on the southern extremity of the neck, is, as before mentioned, (see page 256,) a peculiar-looking tower attached to the southern end of the keeper's dwelling, which is painted white and has a red roof. It shows a fixed white light, of the fourth order, from a height of fifty-four feet above the sea, visible thirteen miles. Its geographical position is

Latitude 41° 39' 59" N.
Longitude 71° 22' 42" W.,

and it bears from

	Miles.
The spindle on Warwick Rock , NE. by E. $\frac{1}{2}$ E.	$\frac{7}{8}$
The black buoy on Quonset Point Shoal , NNE.	nearly 5
The northern end of Hope Island , N. $\frac{1}{2}$ E. Nearly	a little over 3 $\frac{1}{2}$
Northwest Point , NW. $\frac{1}{2}$ N.	$\frac{1}{2}$

From this light-house the horizontally striped buoy off **North Point** bears E. $\frac{1}{4}$ N., nearly one mile and a half distant.

Just to the eastward of **Warwick Light-house** will be seen a smooth grassy island with a very gentle slope except on its westward side, where there is a cliff twenty feet high. The island itself is about thirty feet high in its highest part, with summit nearly level and cleared. This is **Patience Island**, lying off the western side of the northern end of **Prudence Island**, from which it is separated by a passage between three and four hundred yards wide with from seven to fifteen feet at mean low water. This makes good anchorage in sticky bottom for light-draught vessels. The channel, however, being quite narrow. The western and northern shores of **Patience Island** are quite foul,—twelve feet being found at a distance of five hundred yards; and vessels should, therefore, be careful in approaching it not to go nearer than seven hundred yards.

Between the northwestern point of **Patience Island**, called **Northwest Point**, and **Warwick Neck**, leads the channel, which is here about half a mile wide and connects with the **Eastern Passage**.

When through this passage, and abreast of **North Point**, the shores on the eastern side of the bay appear to partake of the same general character as those to the southward, being gently sloping grassy land of moderate height, dotted with houses and orchards. The entrance to **Warren River** will appear bearing about **ENE.**, and part of the village of **Warren**, situated on its eastern bank, will be seen. Here, as before mentioned, the **Eastern** and **Western** passages unite; and thence to the northward as far up as the city of **Providence** the shores and the general features of the land are the same as those described under the head of the "**Eastern Passage**," and a repetition is, therefore, unnecessary. (See pages 256-259.)

DANGERS

IN ENTERING NARRAGANSETT BAY BY THE WESTERN PASSAGE AND PASSING UP TO PROVIDENCE.

Vessels coming from the southward and westward should round **Point Judith** at a distance of about five-eighths of a mile and steer **NE. $\frac{1}{2}$ N.** for **Beaver Tail Light-house**. On this course there are no dangers; but, if beating, it is dangerous to approach the eastern face of **Point Judith Neck** nearer than three-eighths of a mile,—only eighteen feet being found at a distance of a quarter of a

mile from shore as far up as **Black Point**, two miles and a quarter above Point Judith Light-house. Above this and as far up as Narragansett Pier the shores are bold-to and clean and may be safely approached within two hundred yards with not less than seven fathoms water.

On the course for Beaver Tail Light-house, Beaver Tail Point should not be approached nearer than three hundred and twenty-five yards in order to avoid Newton's Rock, a dangerous bare rock lying an eighth of a mile **SW.** by **S.** $\frac{1}{2}$ **S.** from the light-house and surrounded *Newton's Rock.* by shoal water. A can-buoy of the second class, painted red and black in horizontal stripes, is placed in six fathoms, rocky bottom, about four hundred yards **SW.** from the rock; and bears from Brenton's Reef Light-vessel **NW.** $\frac{1}{4}$ **N.**, one mile and three-eighths, and from Beaver Tail Light-house **SW.** $\frac{1}{2}$ **S.**, six hundred yards distant.

On the western side of the passage, and distant from shore about three-eighths of a mile, will be seen **Whale Rock**, a large bare rock surrounded on all sides by deep water, and easily recognized by reason of its being whitewashed. It bears from

	Miles.
The horizontally striped buoy off Newton's Rock, W. $\frac{3}{4}$ N. -----	nearly 1
Brenton's Reef Light-vessel, NW. by W. $\frac{1}{4}$ W. -----	about $2\frac{1}{4}$
Beaver Tail Light-house, W. $\frac{1}{4}$ S. -----	$1\frac{1}{8}$

To the westward of this rock the shore between the mouth of Narrow River and Watson's Point, a little over a mile and an eighth above, should not be approached nearer than five hundred yards, as it is very shoal and strewn with bare and sunken rocks.

About nine hundred yards **NE.** by **E.** $\frac{1}{4}$ **E.** from Watson's Point and nearly the same distance **S.** $\frac{1}{4}$ **W.** from Bonnet Point lies Jones' Ledge, a small detached rocky shoal having only nine feet at mean low water, with from six to seven and a half fathoms on all sides of it, and not buoyed. It bears from Beaver Tail Light-house **NW.** $\frac{1}{2}$ **N.**, a little over one mile and an eighth, *Jones' Ledge.* and from Dutch Island Light-house **SW.** by **S.** $\frac{1}{2}$ **S.**, nearly two miles and a quarter distant. The main channel passes to the eastward of this ledge, and it is not, therefore, in the way of vessels unless they are standing to the westward on a wind; in which case, to avoid it they should not go to the westward of Dutch Island Light-house bearing **NE.** by **N.** $\frac{3}{8}$ **N.**

The western shore of The Beaver Tail from the light-house to Beaver Head, a little over two miles and a half above, is tolerably bold-to and may be safely approached within two hundred and fifty yards with not less than four fathoms, except in the vicinity of Austin's Hollow, when, if beating, vessels should go about as soon as they strike four fathoms.

From Bonnet Point, the northern point of entrance to Wesqueag Cove, to the settlement of South Ferry, opposite Beaver Head, the western shore of the passage should not be approached nearer than three hundred yards,—at which distance eighteen feet will be found. Above South Ferry and as far up as the settlement of North Ferry the shore is bold and clean and may be safely approached within one hundred and fifty yards with not less than eighteen feet.

After passing Beaver Head the sailing-line leads about three hundred yards to the westward of the western face of Dutch Island and carries not less than four fathoms. When beating through the passage between Dutch Island and the mainland vessels should be careful not to approach the island nearer than two hundred yards, as *shoal water makes off to the westward* for that distance from it.

When past Dutch Island there will be seen ahead, bearing about **N.** by **E.** $\frac{3}{8}$ **E.** and a mile and an eighth off, a black nun-buoy.* This is on Plum Beach Shoal, making off from the western shore about a mile and three-eighths above the village of North Ferry and extending nearly to the middle of the passage. It is a little over half a mile in length with an average width of three-eighths of a mile, and has soundings upon it varying from two to sixteen feet. *Plum Beach Shoal.* The buoy is a nun of the second class, marked No. 1, placed in fifteen feet, hard bottom, on the eastern extremity of the shoal, and bears from the northwestern end of Dutch Island **N.** $\frac{3}{8}$ **E.**, a little over a mile and a quarter, and from Poplar Point Light-house **S SE.**, three miles distant. Between the buoy and the shore to the westward of it a channel about seven hundred yards wide crosses the shoal with from twelve to sixteen feet.

Vessels of heavy draught pass to the eastward of the buoy on Plum Beach Shoal about midway between it and the western shore of Conanicut Island; but they should be careful not to approach the island nearer than three hundred and fifty yards in order to avoid Great Ledge, which extends along shore for about two miles and makes off to the westward for distances varying from one hundred and seventy-five yards to a quarter of a mile. It has from two to fifteen feet upon it and is strewn with dangerous bare and sunken rocks, prominent among which are *Slocum's Ledge, The Brothers, Fowler's Rock, Dick's Rock, Sinker Rock and America Ledge.* A good rule to avoid this ledge and the shore to the northward as far up as Sand Point, when beating, is to go about immediately upon striking four fathoms; and this rule is imperative, as the water shoals very abruptly—in some places from four fathoms to four feet.

When past the black nun-buoy on Plum Beach Shoal the passage becomes much wider and is entirely free from obstructions unless vessels are beating to windward; in which case the western shore

should not be approached nearer than three-eighths of a mile, or, in other words, vessels should go about as soon as they strike three fathoms.

Just to the eastward of Fox Island will be seen a black spar-buoy, marked No. 3. This is on Fox Island Shoal, which surrounds Fox Island,—its eastern extremity being about two hundred yards distant from the eastern side of the island. The buoy is placed on the eastern edge of the shoal in eighteen feet, and bears from the black nun-buoy on Plum Beach Shoal $N. \frac{3}{4} W.$, one mile and five-eighths, and from Sand Point $W.$, one mile and three-eighths distant.

A little over a mile to the northward of the buoy on Fox Island Shoal and also on the western side of the passage will be seen the black nun-buoy* on James' Ledge, the southern extremity of a collection of dry flats, bare rocks and sunken ledges making off from the mainland west of Quonset Point for a distance of nearly a mile. The buoy is a nun of the second class, marked No. 5, placed in twelve feet just to the eastward of a detached two-foot spot, and bears from

	Miles.
The black spar-buoy on Fox Island Shoal, N. by E. $\frac{3}{4} E.$ -----a little over	1
Poplar Point Light-house, E. $\frac{1}{8} S.$ -----	$1 \frac{1}{4}$
North Point, W. $\frac{1}{2} N.$ -----a little over	$1 \frac{3}{4}$

In beating, vessels must be careful not to go inside the line between this buoy and Fox Island Shoal buoy,—the area inside this line being occupied by extensive shoals, with from twelve to sixteen feet water, making off from the shores of Wickford Harbor.

To the northward of James' Ledge buoy and distant from it about three-eighths of a mile will be seen a spar-buoy painted red and black in horizontal stripes. This is on Brig Ledge, a small detached rocky shoal lying a little over five-eighths of a mile $SW.$ by $S. \frac{1}{8} S.$ from Quonset Point and having twelve feet upon it at mean low water. The buoy is placed on its southwestern extremity in seventeen feet, and bears from Poplar Point Light-house $E. \frac{1}{2} N.$, a mile and three-eighths, and from North Point $W.$ by $N. \frac{1}{2} N.$, distant a mile and five-eighths, which is here the width of the passage. To the northward and westward of this buoy,—marking a number of bare and sunken rocks lying between it and the shore,—will be seen three spar-buoys,—two red and one black. These buoys require no special mention, being intended as guides for Wickford Harbor.

Off Quonset Point and distant from it about three hundred yards will be seen a black spar-buoy, marked No. 7. This is on the eastern end of Quonset Point Shoal, making off from the point of that name for a little over an eighth of a mile, with from three to twelve feet at mean low water upon it and four and three-quarter fathoms just outside its eastern end. The buoy is placed in eleven feet, and bears from

	Miles.
The horizontally striped buoy on Brig Ledge, NE. $\frac{5}{8} N.$ -----	$\frac{1}{2}$
Poplar Point Light-house, E. by N. $\frac{5}{8} N.$ -----nearly	$1 \frac{1}{4}$
The southern end of Hope Island, W. by S. $\frac{1}{2} S.$ -----nearly	$1 \frac{1}{2}$

On the eastern side of the passage the western and northern shores of Conanicut Island from Sand Point to North Point should not be approached nearer than three hundred and fifty yards; or, if beating, the lead will be the best guide, and you should go about as soon as you strike four fathoms.

When past North Point and the buoy on Quonset Point Shoal you will be in the main portion of the bay and will meet with no obstructions,—it being only necessary to avoid the shores on either side. The western shore from Quonset Point as far up as Pojack Point should be given a berth of five-eighths of a mile, as it is very shoal and has a number of bare rocks, detached shoal spots and sunken ledges (surrounded by depths varying from six to sixteen feet) scattered along its length.

Hope Island, which will be seen lying nearly in the middle of the bay, is tolerably bold-to and may be approached from the southward to within fifty yards with not less than six fathoms water. Falling to the eastward of it, however, its southeastern and eastern sides should be given a berth of four hundred yards, as a number of detached shoal spots, some bare at low water and others having from four to six feet upon them, lie at distances varying from one hundred to two hundred and fifty yards. When in the vicinity of its northeastern end, the shoal making off from that end to the northward for three hundred and fifty yards is best avoided by going about as soon as the lead strikes four fathoms.

On the eastern side of the passage the Prudence Island shore may be safely approached within two hundred yards, with not less than four fathoms, until within a mile and a quarter of Pine Hill Point; when it becomes much shoaler and has only eighteen feet at a distance of six hundred yards from shore. It shoals gradually, however, and the lead will be the best guide until Pine Hill Point bears about $N.$ by $E.$, a little over a quarter of a mile distant. Here there is a detached sunken ledge, with nine feet at mean low water, called Johnson's Ledge; and three hundred yards inshore of it lies another, with nine and a half feet, known as Pine Hill Ledge. These ledges are not in the way unless you are standing

Johnson's and
Pine Hill
Ledges.

to the eastward on a wind; in which case, to avoid them you must not go to the east- *Dangers--West-ern Passage.*

The upper part of the Western Passage, to the northward of a line between Pine Hill Point and Pojack Point, is almost entirely occupied by *extensive shoals* making off to the westward from the western sides of Prudence and Patience islands, and to the eastward from the entrance to Greenwich Bay, with depths upon them varying from *six to eighteen feet* and their extremities almost joining. A narrow channel, with an average width of four hundred yards and a depth of water varying from three and a quarter to twelve fathoms, runs between the eastern and western edges of these shoals in about a due N. direction for Warwick Light-house until within three hundred and fifty yards of it. Here it divides,—one branch running to the northwestward into Greenwich Bay, close under the western face of Warwick Neck; and the other, which is the Western Passage, running about E NE. past the northern end of Patience Island and joining the Eastern Passage abreast of North Point. From fifteen to eighteen feet can be carried across the shoals by following the directions to be given hereafter; but, in beating, vessels must not go to the westward of Warwick Light-house bearing NE. $\frac{3}{4}$ N., thus avoiding *the detached rocks and bare ledges* lying in the entrance to Greenwich Bay.

The western side of Patience Island, from its southwestern end to Northwest Point, must not be approached nearer than seven hundred yards in order to avoid *the shoal* (which has several sunken ledges lying along its length) *making off to the westward from it.* This rule is imperative, as only twelve feet is found at a distance of one hundred yards from the eastern edge of the channel.

When within about seven hundred yards of Warwick Light-house the course turns abruptly to the eastward, running E NE. Here the Western Passage has a width of between six and seven hundred yards and a depth of from three and three-quarter to ten fathoms; and this width and depth it retains up to its point of junction with the Eastern Passage. Its southern side, from Northwest Point to North Point, is very shoal,—*a depth of only eleven feet* being found in one place a little over a quarter of a mile from the northern end of Patience Island. Its northern side, from Warwick Light-house to its point of junction with the Eastern Passage, is also shoal; but the soundings are gradual and vessels of twelve feet draught and less may approach the eastern face of Warwick Neck anywhere within six hundred yards. Vessels of very heavy draught should not go to the northward of Warwick Light-house bearing W. by S. $\frac{3}{4}$ S. until past the horizontally striped buoy off North Point. Between Northwest Point and North Point vessels standing to the southward on a wind must go about as soon as they strike four fathoms,—by doing which they will avoid *the shoal ground making off to the northward from Patience Island and from the northern end of Prudence Island.*

When abreast of Patience Island there will be seen directly ahead a spar-buoy painted red and black in horizontal stripes. This is on Fort Rock, the northern extremity of a long shoal making off from North Point to the northward for a distance of over half a mile with depths upon it varying from five to fifteen feet. The buoy is placed in fifteen feet at mean low water and marks the junction of the Eastern and Western passages. It bears from

Fort Rock.

	Miles.
North Point, N. -----	$\frac{1}{2}$
Northwest Point, NE. $\frac{3}{8}$ E. ----- a little over	$1\frac{1}{4}$
Warwick Light-house, E. $\frac{7}{8}$ N. ----- nearly	$1\frac{1}{2}$

The sailing-line passes to the northward and westward of the buoy, and vessels must, under no circumstances, pass to the southward of it,—as only ten feet water is found two hundred and fifty yards inshore of it.

When up with the buoy on Fort Rock another horizontally striped buoy will be seen bearing about E. $\frac{3}{4}$ N. and about a mile and an eighth distant. This is on Ohio Ledge, a small detached rocky shoal about three hundred yards long and two hundred wide, with a depth of from eight to eleven feet upon it. The buoy is a can* of the second class, painted red and black, and placed on the southern extremity of the ledge in twelve feet water. It bears from the buoy on Fort Rock E. $\frac{1}{2}$ N., nearly a mile and an eighth, and from Conimicut Point Light-house S. by E. $\frac{1}{4}$ E., nearly two miles and three-eighths distant. *Ohio Ledge.*

Ohio Ledge is not in the way of vessels using the Western Passage; and may be easily avoided, when in its vicinity, by going about as soon as the lead strikes fourteen feet.

From the buoy on Fort Rock the course turns abruptly to the northward and the black nun-buoy* on Conimicut Middle Ground will soon be seen bearing about N NE. Conimicut Middle Ground is part of the extensive shoal ground making off to the eastward from the mainland as far as Ohio Ledge with soundings upon it varying from two to eighteen feet. *A number of sunken rocks and rocks awash at low water* lie scattered over its surface but well inshore. The buoy is a nun of the second class, marked No. 11, placed on the eastern side of the shoal in sixteen feet water, and bears from the horizontally striped buoy on Fort Rock N. by E. $\frac{3}{4}$ E., nearly a mile and three-quarters, and from Conimicut Point Light-house S. $\frac{3}{4}$ W., a little over three-quarters of a mile distant. The sailing-line crosses the shoal in seventeen feet and passes about seventy-five yards to the eastward of the buoy. *Conimicut Middle Ground.*

With Conimicut Point Light-house bearing **NW.** by **N.**, half a mile distant, the sailing course for the Eastern and Western passages unite; and thence the dangers, as far up as the city of Providence, are identical with those of the Eastern Passage.

SAILING DIRECTIONS

FOR ENTERING NARRAGANSETT BAY BY THE WESTERN PASSAGE AND PASSING UP TO PROVIDENCE.

Vessels which have come through Long Island Sound and intend to enter Narragansett Bay must, when in The Race, with Little Gull Island Light-house bearing **SW.** by **W.** $\frac{1}{2}$ **W.**, a little over a mile, and New London Light-house **N.** $\frac{3}{4}$ **E.**, six miles distant, with thirty-five fathoms, steer **E.** $\frac{1}{2}$ **N.** for twenty-eight miles and five-eighths, carrying not less than seven fathoms water. On this course, when Point Judith Light-house bears **N.** $\frac{3}{8}$ **E.**, a little over a mile distant, in seven fathoms, steer **NE.** $\frac{1}{2}$ **N.**, heading directly for Beaver Tail Light-house and carrying not less than seven fathoms. *Or, having come from the westward along the southern side of Long Island,* bring Montauk Point Light-house to bear **N.** by **W.** $\frac{3}{4}$ **W.**, one mile and five-eighths distant, in eight fathoms water, and steer **NE.** $\frac{3}{8}$ **E.** for twenty-four miles, carrying not less than seven fathoms, and passing to the westward of Block Island. Continue this course until Point Judith Light-house bears **N.** $\frac{3}{8}$ **E.**, a little over a mile distant, in seven fathoms; when steer **NE.** $\frac{1}{2}$ **N.**, heading directly for Beaver Tail Light-house, as before. *Coming from the westward, and intending to pass to the eastward of Block Island,* bring Montauk Point Light-house to bear **N.** by **W.** $\frac{3}{4}$ **W.**, one mile and five-eighths distant, in eight fathoms, as before, and steer **E.** by **N.** $\frac{1}{8}$ **N.** for fifteen and a quarter miles, carrying not less than eight fathoms. On this course, when Block Island Southeast Light-house bears **NW.** $\frac{3}{4}$ **W.**, nearly a mile and a quarter distant, with between eleven and twelve fathoms water, steer **NE.** by **N.** $\frac{3}{8}$ **N.**, heading nearly for Beaver Tail Light-house and carrying not less than ten fathoms.

When within three-quarters of a mile of Beaver Tail Light-house, with Brenton's Reef Light-vessel bearing **SE.** by **E.** $\frac{3}{8}$ **E.**, one mile and three-eighths distant, and the horizontally striped buoy off Newton's Rock in range with the light-house on a bearing of **NE.** $\frac{1}{2}$ **N.**, the sailing-lines from the westward unite, the depth being twelve and a half fathoms. From this position steer **N.** by **E.** up the passage, passing about three hundred yards to the westward of Dutch Island Light-house and carrying not less than four fathoms. Continue this course until the northern end of Dutch Island bears **E.** by **S.** $\frac{1}{2}$ **S.** and Dutch Island Light-house **S.** $\frac{1}{4}$ **E.** **Nearly**; when the depth will be between five and six fathoms, and the course **NE.** by **N.** $\frac{7}{8}$ **N.**, passing about an eighth of a mile to the eastward of the black buoy on Plum Beach Shoal and six hundred yards to the westward of the southern end of Hope Island, carrying not less than three and a quarter fathoms water. On this course, when Warwick Light-house bears **N.**, a little over two miles and an eighth, and Northwest Point **N.** by **E.** $\frac{1}{4}$ **E.**, one mile and three-quarters distant, with three and a quarter fathoms, steer **N.** for the light-house, which course will lead, with not less than three and a half fathoms, through the narrow channel between the shoals at the head of the bay. When within seven hundred yards of Warwick Light-house, with nine and a half fathoms, steer **NE.** by **E.** $\frac{3}{4}$ **E.**, nearly for the horizontally striped buoy on Fort Rock, carrying not less than six fathoms. When up with it, with Conimicut Point Light-house bearing **N.** by **E.** $\frac{1}{8}$ **E.** and Warwick Light-house **W.** by **S.** $\frac{1}{2}$ **S.**, steer **NE.** by **N.** $\frac{7}{8}$ **N.**, crossing the shoal making off to the southward from Conimicut Point in seventeen feet, and passing to the eastward of the black buoy on Conimicut Middle Ground, close-to. When past this buoy, the sailing-line joins that of the Eastern Passage about half a mile below the mouth of Providence River, with Conimicut Point Light-house bearing **NW.** $\frac{7}{8}$ **N.**, half a mile distant. From this position steer **NW.** by **N.** $\frac{3}{8}$ **N.** into the river, following the directions given on page 266.

Or, vessels of twelve feet draught and less may bring the northern end of Dutch Island to bear **E.** by **S.** $\frac{1}{2}$ **S.** and Dutch Island Light-house **S.** $\frac{1}{4}$ **E.** **Nearly**, as before, and steer **N.** by **E.** $\frac{3}{8}$ **E.**, heading directly for Warwick Light-house, crossing the eastern end of Plum Beach Shoal in fourteen feet and carrying not less than sixteen feet at mean low water across the shoals at the head of the bay. Continue this course until within eight hundred and fifty yards of the light-house, with Conimicut Point Light-house bearing **NE.** by **N.** and Northwest Point **E.** $\frac{3}{4}$ **S.** Here the depth is six fathoms, and **NE.** by **E.** $\frac{3}{4}$ **E.** will lead nearly for the horizontally striped buoy on Fort Rock, as before, following the directions given above.

The above courses pass four hundred and fifty yards to the westward of the horizontally striped buoy off Newton's Rock; nearly three-quarters of a mile to the eastward of Whale Rock; three-eighths of a mile to the westward of Beaver Tail Light-house; a little over half a mile to the eastward of Jones' Ledge; and one-eighth of a mile to the westward of Dutch Island Light-house. Above this the **NE. by N. $\frac{1}{8}$ N.** course passes two hundred and fifty yards to the eastward of the black nun-buoy on Plum Beach Shoal; nearly one mile to the eastward of the black spar-buoy on Fox Island Shoal; six hundred and fifty yards to the westward of Sand Point; a little over a mile to the eastward of the black nun-buoy on James' Ledge; five-eighths of a mile to the westward of North Point; one mile to the eastward of the horizontally striped buoy on Brig Ledge; seven-eighths of a mile to the eastward of the black spar-buoy on Quonset Point Shoal; six hundred yards to the westward of the southern end of Hope Island; a little over seven-eighths of a mile to the westward of Pine Hill Point; nine hundred yards to the westward, and six hundred and fifty yards to the northward, of Northwest Point; one hundred yards to the northward and westward of the horizontally striped buoy on Fort Rock; and about fifty yards to the eastward of the black nun-buoy on Conimicut Middle Ground. The **N. by E. $\frac{1}{8}$ E.** course leads directly for the black nun-buoy on Plum Beach Shoal and passes nearly three-quarters of a mile to the eastward of the black spar-buoy on Fox Island Shoal; five-eighths of a mile to the westward of Sand Point; a little over two-thirds of a mile to the eastward of the black nun-buoy on James' Ledge; a little over one mile to the westward of North Point; five-eighths of a mile to the eastward of the horizontally striped buoy on Brig Ledge; nine hundred yards to the eastward of the black spar-buoy on Quonset Point Shoal; a little over three-quarters of a mile to the westward of the southern end of Hope Island; one mile and five-eighths to the westward of Pine Hill Point; a little over half a mile to the eastward of the beacon on Warwick or Spindle Rock; and a little over half a mile to the westward, and six hundred yards to the northward, of Northwest Point.

A vessel coming from the Eastward and intending to enter Narragansett Bay by the Western Passage must, when up with Brenton's Reef Light-vessel, steer **NW. by W. $\frac{3}{8}$ W.** for a little over one mile and three-eighths, or until Beaver Tail Light-house bears **NE. $\frac{1}{2}$ N.**, with the horizontally striped buoy off Newton's Rock nearly in range with it. Here the depth is twelve and a half fathoms and **N. by E.** will lead directly up the passage, following the directions previously given. *Or, from the light-vessel* steer **NW.** until Beaver Tail Light-house bears **E. by N. $\frac{1}{2}$ N.**, when **N. by E.** will lead up the passage, as before.

On the above courses, to enter Dutch Island Harbor.—On the **N. by E.** course from off Beaver Tail Light-house, when Dutch Island Light-house bears **NE. by N. $\frac{5}{8}$ N.**, about half a mile distant, in seven and a quarter fathoms, steer **NE. $\frac{1}{8}$ E.** for the entrance to the harbor, carrying not less than six fathoms. On this course, when the light-house bears **W. $\frac{1}{8}$ N.**, four hundred and twenty-five yards distant, steer anywhere from **NE.** to **ESE.** for the head of the harbor, anchoring, according to draught, in from eight fathoms to fifteen feet.

On the above courses, to enter Wickford Harbor.—On the **NE. by N. $\frac{1}{8}$ N.** course from off the northern end of Dutch Island, when abreast of the black nun-buoy on Plum Beach Shoal, in three and three-quarter fathoms, with Poplar Point Light-house bearing **NNW.** and Dutch Island Light-house **S. by W. $\frac{1}{8}$ W.**, steer **N. $\frac{1}{2}$ W.** Continue this course, carrying not less than three and a half fathoms, until you are abreast of the black spar-buoy on Fox Island Shoal and distant from it about three hundred yards, with Poplar Point Light-house bearing **NW. $\frac{1}{4}$ N.** Here the depth is five fathoms and the course **NW. by N. $\frac{3}{8}$ N.**, following the directions given for the harbor.

On the above courses, to enter Greenwich Bay.—The due **N.** course for Warwick Light-house must be continued until you are within five hundred yards of it, with North Point of Prudence bearing **E. $\frac{1}{4}$ S.**, a little over one mile and three-eighths distant. At this point the depth will be five fathoms and **NW. $\frac{3}{8}$ W.** will lead, with not less than three fathoms, up to the black spar-buoy on Sandy Point Shoal; after which the directions given for the harbor must be followed.

HARBORS IN NARRAGANSETT BAY.

This bay contains several important harbors,—the most frequented of which are Newport, Dutch Island and Providence. Newport Harbor is situated on the western side of Rhode Island, near its southwestern end. Dutch Island Harbor lies on the western shore of Conanicut Island, between it and Dutch Island. Mount Hope Bay and its subsidiary harbors of Cole's River, Lee's River, Taunton and Fall rivers, is contained between Bristol Neck and the mainland at the northeastern end of the bay; Wickford and Greenwich harbors lie on the western side of the bay; Bristol Harbor, between Bristol Neck on the east and Popasquash Neck on the west; Warren River, (with the town of Warren on its eastern bank,) between the northern end of Bristol Neck and Runstick Neck, about two miles below the mouth of Providence River; and Providence Harbor at the head of Providence River.

NEWPORT HARBOR.

This harbor, which is an indentation of irregular shape, on the western side of Rhode Island, has two entrances, separated by Goat Island. The southern entrance—the one most frequently used by coasters—is contained between Goat Island on the north and the smooth, nearly level and grassy point upon which Fort Adams is built, on the south; while the northern entrance lies between the southern end of Coasters' Harbor Island on the north and Goat Island on the south. The city of Newport occupies the whole of the eastern shore of the harbor.

The **Southern Passage** is nine hundred yards wide at its mouth; but the available channel contracts to a width of only three hundred yards, with fifteen feet at mean low water, between the southern end of Goat Island and Lime Rock Light-house, on the southern side of the harbor. The channel here takes an abrupt turn to the northward, rendering it exceedingly awkward for sailing vessels when the wind is scant.

The **Northern Passage** has a width of nearly five-eighths of a mile and a depth of not less than sixteen feet; but after rounding Goat Island Light-house, on the northern extremity of the island, the channel contracts to a width of about three hundred and twenty-five yards, and, running in a southerly direction, carries not less than three and a quarter fathoms until well up the harbor, when the depth diminishes to about fifteen feet. This passage is the one most commonly used by the large steamers plying between New York and Newport.

The most conspicuous objects visible on approaching Newport Harbor are Fort Adams, (on the southern point of entrance,) Rose Island and Goat Island. **Fort Adams** is a large casemated fort of granite, surmounted in places by a parapet of earth with sodded traverses. It is built on a smooth, nearly level and grassy point, from the northern end of which extends a long wharf to the edge of the channel. The city of Newport will be seen (after passing Fort Adams) stretching along the entire eastern and southern shores of the harbor.

Goat Island (see page 254) is low and grassy, with smooth and nearly level surface, and its summit crowned with buildings.

Goat Island. It is about nine hundred yards long in a N. by E. and S. by W. direction, and has an earthwork on its highest part, known as **Fort Walcott**. The island is the site of the U. S. Naval Torpedo Station, to which the buildings on its summit belong.

Newport Harbor Light-house. From the northern end of Goat Island extends a stone breakwater a little over four hundred yards long in a N. by E. direction, on the extremity of which stands a white dwelling with stone tower attached. This is Newport Harbor Light-house, sometimes called **Goat Island Light-house**, and is the guide to the Northern Passage into Newport Harbor, (see page 255.) It shows a fixed white light, of the fourth order, from a height of thirty-three feet above the sea, visible eleven miles. Its geographical position is

Latitude ----- 41° 29' 34" N.
Longitude ----- 71° 19' 38" W.,

and it bears from

	Miles.
Beaver Tail Light-house, NE. by E. $\frac{1}{2}$ E. -----	a little over 4 $\frac{1}{2}$
The western extremity of Castle Hill, NE. $\frac{1}{2}$ E. -----	a little over 2 $\frac{1}{2}$
Bull Point, ENE. -----	nearly 1 $\frac{1}{2}$
The long wharf on the northern side of Fort Adams, NE. -----	nearly $\frac{1}{3}$

From this light-house the black buoy on Tracey's Ledge bears NW. $\frac{1}{4}$ W. Nearly, eight hundred and fifty yards, and the red buoy on St. Patrick's Rock NE. by N. $\frac{1}{2}$ N., about three-eighths of a mile distant.

A bell struck by machinery is sounded at this light-house at intervals of fifteen seconds during thick weather.

Rose Island and Light-house. To the westward of Goat Island Light-house, and distant from it about five-eighths of a mile, will be seen a low islet, with a grey dwelling surmounted by a black lantern on its southwestern end. This island is Rose Island and the house Rose Island Light-house,—one of the guides for the Eastern Passage of Narragansett Bay, (see page 254.) Just to the eastward of the light-house will be seen the remains of an old fortification of brick. The light is shown from the keeper's dwelling, which is of wood, painted drab color with brown trimmings, and has a mansard roof on which is the tower and lantern. It is a fixed red light, of the sixth order, shown from a height of fifty-eight feet above the sea, visible eleven miles. Its geographical position is

Latitude ----- 41° 29' 42" N.
Longitude ----- 71° 20' 34" W.,

and it bears from

	Miles.
The end of the long wharf on the northern side of Fort Adams, N. $\frac{1}{2}$ W. -----	$\frac{1}{2}$
Lime Rock Light-house, NW. by N. $\frac{1}{2}$ N. -----	nearly 1 $\frac{1}{2}$
Goat Island Light-house, W. by N. $\frac{1}{2}$ N. -----	nearly $\frac{1}{2}$

From Fort Adams the western shore of the harbor turns abruptly and takes a general direction about S. by W. for five-eighths of a mile; and then runs in a nearly ENE. direction for a little over half a mile to abreast of Lime Rock Light-house. Thus is formed a large cove, nearly semicircular in shape, called **Brenton's Cove**, in which good anchorage may be found in from fifteen to seventeen feet, soft bottom. The shores are of moderate height, gently sloping, and dotted with ornamental trees and handsome villas.

When past Fort Adams, and between it and Goat Island, there will be seen on the southern side of the harbor, close inshore, a small wooden dwelling-house, whitewashed. This is Lime Rock Light-house, built on a high bare rock called **Lime Rock**, and is the guide to the Southern Passage into Newport Harbor. The light is placed on the northwestern end of the keeper's dwelling and is a fixed red light, of the sixth order, shown from a height of thirty feet above the sea, visible eleven miles. Its geographical position is

Latitude -----	41° 28' 37" N.
Longitude -----	71° 19' 35" W.,

and it bears from

The end of the long wharf on the northern side of Fort Adams, SE. $\frac{1}{2}$ E. -----	nearly $\frac{1}{2}$ mile.
The black nun-buoy on the southern end of Goat Island Shoal, S. by W. $\frac{1}{2}$ W. -----	300 yards.
Goat Island Light-house, S. $\frac{1}{2}$ W. -----	nearly 1 mile.

Lime Rock Light-house may be safely approached within twenty-five yards with not less than thirteen feet; but vessels must not attempt to pass between it and the shore, as the area inside of it is rendered dangerous by bare and sunken rocks.

DANGERS

IN APPROACHING AND ENTERING NEWPORT HARBOR.

1. *From the Eastward, by the Southern Passage.*—A vessel from the eastward bound for the entrance to Narragansett Bay and thence to Newport will meet with no obstructions until nearly up with Brenton's Reef Light-vessel; when there will be seen, about a mile to the north-eastward of the latter, a red spar-buoy. This is on Brenton's Reef, a long shoal **Brenton's Reef**, making off to the southwestward from Brenton's Point for nearly half a mile. It is awash at mean low water near its southern end and has several half-tide ledges scattered along its length. The buoy is marked No. 2, placed in eighteen feet on the southern edge of the reef, and bears from

	Miles.
The Light-vessel, NE. by E. $\frac{1}{4}$ E. -----	1
Beaver Tail Light-house, ESE. -----	1 $\frac{3}{4}$
The southern extremity of Brenton's Point, SW. $\frac{1}{2}$ S. -----	nearly $\frac{1}{2}$

Between the buoy and the light-vessel the passage is about a mile wide with a depth of from nine to fourteen fathoms, and perfectly safe at all times. The buoy must, however, receive a good berth during the flood-tide, which sets strongly on to the reef.

About five-eighths of a mile to the eastward of Brenton's Reef buoy and nearly half a mile from shore lies a bare rock, surrounded by shoal water, called **Seal Rock**. It is not in the way of vessels bound into the bay unless they are standing to the northward on a wind; in which case it may be avoided by going about as soon as Brenton's Reef Light-vessel bears W. by S.

When past the light-vessel and the buoy on Brenton's Reef both shores are bold-to and may be approached to within four hundred yards with not less than five fathoms. But, if Beaver Tail Light-house be first made, it should not be approached from the south-ward nearer than six hundred yards in order to avoid **Newton's Rock**, a dangerous bare rock lying an eighth of a mile SW. by S. $\frac{1}{2}$ S. from the light-house and surrounded by shoal water. A nun-buoy* of the second class, painted red and black in horizontal stripes, is placed in five and a half fathoms about four hundred yards SW. from the rock, and bears from Brenton's Reef Light-vessel NW. $\frac{1}{4}$ N., one mile and three-eighths, and from Beaver Tail Light-house SW. $\frac{1}{2}$ S., six hundred yards distant.

About one hundred and fifty yards from the southern end of Castle Hill lies a small detached rock called **Butter-Ball Rock**. It is always out and is the first danger met with after passing Brenton's Reef. It may be avoided by not approaching the southern extremity of Castle Hill nearer than an eighth of a mile.

On the western side of the passage and about an eighth of a mile S. by E. $\frac{3}{4}$ E. from Southwest Point, at the entrance to Mackerel Cove, lies Kettle-Bottom Rock, a small rock, always out, and about fifty yards long in a N NE. and S SW. direction. It is bold-to except at its northern end, where a shoal with from six to nine feet water upon it extends in a N. by E. direction for one hundred and fifty yards; and there are several detached shoals, with from ten to fifteen feet at mean low water, between the rock and Conanicut Island. It is, therefore, dangerous for vessels to pass either to the westward or northward of this rock; although a channel with not less than five and a half fathoms exists between it and Conanicut Island.

To avoid Kettle-Bottom Rock, vessels must not shut in Goat Island Light-house behind Fort Dumpling; or, in other words, must not stand to the westward of that light-house bearing NE. by E. $\frac{3}{4}$ E.

With the northern end of Castle Hill bearing SE. $\frac{1}{4}$ E., about a quarter of a mile distant, the course leads directly for Goat Island Light-house, and there are no dangers to be met with unless a vessel is standing to the westward on a wind. In such a case care must be taken in order to avoid

The Dumplings. The Dumplings, a cluster of rocky islets, always out, lying an eighth of a mile N NE. from Bull Point. These rocks lie scattered over an area of about an eighth of a mile in diameter, with narrow channels having from eighteen feet to four and a half fathoms running among and between them. The easternmost and largest of the group bears from Bull Point NE.; about an eighth of a mile, and from the end of the long wharf on the northern side of Fort Adams W. by N., distant nearly three-quarters of a mile, which is here the width of the channel.

To avoid The Dumplings, vessels, if beating, must not stand to the westward of Rose Island Light-house bearing NE. $\frac{3}{4}$ N.

When within three-quarters of a mile of Goat Island Light-house, with Rose Island Light-house bearing N. $\frac{1}{4}$ W., a little over five-eighths of a mile distant, the course turns nearly at right angles, leading directly for Lime Rock Light-house. On this course, when past Fort Adams

Brenton's Cove Rock. there will be seen to the southward, nearly in the middle of the entrance to Brenton's Cove, a red spar-buoy. This is on Brenton's Cove Rock, a small detached rocky shoal with ten feet at mean low water upon it and three fathoms on all sides. The buoy is marked No. 2, placed on the northern edge of the shoal in ten feet, and the sailing-line passes to the northward of it; but vessels entering Brenton's Cove pass it on either side, close-to. The buoy bears from

The end of the long wharf on the northern side of Fort Adams,	
SE. by S. $\frac{3}{4}$ S. -----	600 yards.
Lime Rock Light-house, W. by N. $\frac{3}{8}$ N. -----	600 "
Goat Island Light-house, SW. by S. $\frac{1}{4}$ S. -----	nearly 1 mile.

Just to the northward of Lime Rock Light-house and distant from the southern end of Goat Island about four hundred yards will be seen a black nun-buoy*. This is on Goat Island Shoal, making off to the southward from Goat Island (with from one to seven feet upon it at mean low water) to a distance of one hundred and fifty yards. The buoy is a nun of the second class, marked No. 1, placed in sixteen feet off the southern extremity of the shoal, and bears from the red spar-buoy on Brenton's Cove Rock E. $\frac{3}{4}$ N., seven hundred yards, and from the end of the long wharf on the northern side of Fort Adams E SE., a little over half a mile distant.

The channel passes between the black nun-buoy on Goat Island Shoal and Lime Rock Light-house and is about three hundred yards wide, with not less than thirteen feet in it at mean low water; but fifteen feet may be taken through it by passing midway between the buoy and the light-house.

On the southeastern side of the harbor, about three hundred and fifty yards from the wharf-line of the city, lies Little Lime Rock, (or East Rock as it is sometimes called,) a bare rock, upon which is built a granite structure surmounted by an iron spindle with keg-shaped cage on top. This is East Rock Spindle, and it bears from Lime Rock Light-house E. by N. $\frac{1}{4}$ N., six hundred and fifty yards distant, and from the black nun-buoy on Goat Island Shoal E. $\frac{3}{4}$ S., a quarter of a mile distant. The area inside this spindle is nearly bare at mean low water,—only one foot being found one hundred and fifty yards inshore of it. A vessel must be careful, therefore, not to go inside of a line from the spindle to Lime Rock Light-house.

When past the black nun-buoy on Goat Island Shoal the course turns abruptly to the northward, and anchorage will be found anywhere along the eastern face of Goat Island in from sixteen feet to three and three-quarter fathoms, soft bottom, at a distance of two hundred yards. Or, vessels may steer for the wharf-line of the city and anchor, according to draught, in from seven to fourteen feet, soft bottom.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING NEWPORT HARBOR.

I. *From the Eastward, by the Southern Passage.*—Vessels from the eastward must, when up with Brenton's Reef Light-vessel, with Beaver Tail Light-house bearing **NW.** by **N.** $\frac{1}{2}$ **N.**, steer **NE.** by **N.** $\frac{1}{2}$ **N.** for the entrance to the Eastern Passage of Narragansett Bay, carrying not less than thirteen and a half fathoms. On this course, when past Castle Hill, with Goat Island Light-house bearing **NE.** by **E.** $\frac{1}{4}$ **E.**, in twenty-one fathoms, steer for the light-house, carrying not less than eleven and a half fathoms water, until within three-quarters of a mile of it. When Rose Island Light-house bears **N.** $\frac{3}{4}$ **W.** and Lime Rock Light-house **SE.**, the depth will be twelve fathoms and the course **SE.** for the latter, carrying not less than four fathoms. Continue this course until within four hundred yards of Lime Rock Light-house, with Rose Island Light-house bearing **N.** by **W.** $\frac{1}{2}$ **W.** and the red spar-buoy on Brenton's Cove Rock **W.** by **S.** $\frac{1}{2}$ **S.** From this position **E.** $\frac{3}{4}$ **S.** will lead, with not less than fifteen feet, up to the black nun-buoy on Goat Island Shoal, passing to the southward of it, close-to. When past this buoy, with Lime Rock Light-house bearing **SW.** $\frac{3}{4}$ **S.**, three hundred yards distant, and the spindle on Little Lime Rock is nearly ahead, steer **NNE.** into the harbor, anchoring in from seven feet to three and three-quarter fathoms, soft bottom.

The above courses pass about five-eighths of a mile to the westward of the red spar-buoy on Brenton's Reef; about a mile and a quarter to the eastward of Beaver Tail Light-house; a quarter of a mile to the westward of the western face of Castle Hill; half a mile to the eastward of Kettle-Bottom Rock; six hundred yards to the southeastward of The Dumplings; one hundred and fifty yards to the northward of the end of the long wharf making off from Fort Adams; three hundred yards to the north-eastward of the red spar-buoy on Brenton's Cove Rock; an eighth of a mile to the northward of Lime Rock Light-house; and four hundred yards to the westward of the spindle on Little Lime Rock.

II. *From the Westward, by the Southern Passage.*—Vessels from the southward and westward, intending to enter Newport Harbor, must bring Point Judith Light-house to bear **N.** $\frac{3}{4}$ **E.**, a little over a mile distant, in seven fathoms water, and steer **NE.** $\frac{1}{2}$ **N.** **Nearly.** This course will lead, with not less than eight fathoms, into the Eastern Passage of Narragansett Bay and to a position off Castle Hill. At this point, with Beaver Tail Light-house bearing **SW.** by **W.** $\frac{1}{2}$ **W.** and Goat Island Light-house **NE.** by **E.** $\frac{1}{4}$ **E.**, in twenty-one fathoms, steer **NE.** by **E.** $\frac{1}{4}$ **E.** for the latter, carrying not less than eleven and a half fathoms. When within three-quarters of a mile of Goat Island Light-house, with Rose Island Light-house bearing **N.** $\frac{3}{4}$ **W.** and Lime Rock Light-house **SE.**, steer **SE.**, heading directly for the light-house and following the directions previously given.

The above courses pass seven-eighths of a mile to the westward of Brenton's Reef Light-vessel; a little over five-eighths of a mile to the eastward of the horizontally striped buoy off Newton's Rock; nearly one mile and a quarter to the westward of the red spar-buoy on Brenton's Reef; three-quarters of a mile to the eastward of Beaver Tail Light-house; eight hundred yards to the westward of Butter-Ball Rock; and half a mile to the eastward of Kettle-Bottom Rock.

DANGERS

IN APPROACHING AND ENTERING NEWPORT HARBOR.

II. *From the Southward, by the Northern Passage.*—A vessel from the southward, intending to enter Newport Harbor by the Northern Passage, must, when between Fort Dumpling and Fort Adams, with Rose Island Light-house bearing **NE.** by **N.** $\frac{1}{2}$ **N.** and Goat Island Light-house **NE.** by **E.** $\frac{1}{4}$ **E.**, steer **NE.** $\frac{3}{4}$ **E.** On this course there are no dangers; but, if beating to windward, vessels should beware of Rose Island Point, making off to the southward from Rose Island for **Rose Island Point.** nearly an eighth of a mile with depths upon it varying from two to eighteen feet. On its southern extremity, where there is only seven feet, will be seen an iron spindle surmounted by a keg-shaped cage. This spindle bears from Rose Island Light-house **SE.** $\frac{3}{4}$ **S.**, three hundred and twenty-five yards, and from Goat Island Light-house **W.** by **N.**, nearly five-eighths of a mile distant. Just to the eastward of this spindle, bearing **E.** $\frac{1}{4}$ **S.** and distant about three hundred yards, lies a small detached shoal spot with only fourteen feet upon it at mean low water. Between it and the spindle there is a channel about three hundred yards wide with a depth of four fathoms, but it is rarely, if ever, used.

To avoid Rose Island Point and the shoal spot to the eastward of it, vessels must not stand to the northward of Goat Island Light-house bearing **E.** $\frac{1}{2}$ **S.**; or to the westward of the long wharf on the northern side of Fort Adams bearing **S.** by **W.** $\frac{3}{4}$ **W.**

When between Rose Island and Goat Island Light-house there will be seen to the westward of the course, bearing about **N. by W. $\frac{3}{4}$ W.** and distant a little over six hundred yards, a black spar-buoy. This is on Tracey's Ledge, a small detached shoal spot having only nine and a *Tracey's Ledge*. half feet upon it and surrounded on all sides by deep water. The buoy is marked No. 3, placed in four and a half fathoms on the western side of the ledge, and bears from the spindle on Rose Island Point **NE. $\frac{1}{2}$ E.**, a little over three-eighths of a mile, and from Goat Island Light-house **NW. by N. Nearly**, eight hundred and fifty yards distant. To avoid this ledge (when beating) vessels must be careful not to stand to the northward of Rose Island Light-house bearing **W. $\frac{1}{2}$ S.**

The eastern face of Rose Island, from its southeastern end to its northern end, is very shoal,—the flats making off to a distance of three hundred and fifty yards with only four feet upon them at mean low water. Vessels, therefore, must not venture inside the line between the spindle on Rose Island Point and the black spar-buoy on Tracey's Ledge.

Nearly opposite to the black spar-buoy on Tracey's Ledge and close in with the eastern side of the passage will be seen the red spar-buoy on St. Patrick's Rock, a sunken rock with only eight feet upon it at mean low water, lying upon the edge of the eighteen feet curve, about one hundred and fifty yards from shore. The buoy, which is marked *St. Patrick's Rock*. No. 4, is placed on the western side of the rock, close-to, in eight feet water, and bears from the black spar-buoy on Tracey's Ledge **E. $\frac{1}{2}$ S.**, eight hundred and seventy-five yards, and from Goat Island Light-house **NE. by N. $\frac{1}{4}$ N.**, three-eighths of a mile distant.

The channel passes between the buoy on St. Patrick's Rock and Goat Island Light-house and has not less than three and a half fathoms water; but exactly midway between the two lies a small detached spot with eighteen feet upon it and four fathoms on all sides. The sailing-line passes to the southward of this spot, between it and Goat Island Light-house, and then turns abruptly to the southward,—leading midway between Goat Island and the wharf-line of the northern part of the city. Vessels drawing over fifteen feet must not approach Goat Island Light-house nearer than two hundred yards, as only sixteen feet is found at that distance from it. After rounding the light-house there are no dangers,—it being only necessary to keep in the middle of the channel. Anchorage will be found anywhere after passing Goat Island Light-house.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING NEWPORT HARBOR.

III. From the Southward, by the Northern Passage.—A vessel from the southward, intending to enter Newport Harbor by the Northern Passage, must, when on the **NE. by E. $\frac{1}{4}$ E.** course for Goat Island Light-house, (see page 281,) bring Rose Island Light-house to bear **NE. by N. $\frac{1}{2}$ N.**, in twenty-three fathoms, and steer **NE. $\frac{2}{3}$ E.**, which course will lead directly for the red spar-buoy on St. Patrick's Rock. On this course there will be not less than five fathoms, and when Goat Island Light-house bears **S. by E. $\frac{1}{3}$ E.**, about three hundred yards distant, and Rose Island Light-house **W. $\frac{1}{4}$ N.**, a little over five-eighths of a mile distant, with between four and five fathoms water, steer **E. $\frac{1}{2}$ S.**, carrying not less than three and a half fathoms. When Goat Island Light-house bears **SW. by W.**, three hundred and fifty yards distant, steer **S. by W.** into the harbor, anchoring anywhere, after passing the light-house, in from three to three and three-quarter fathoms, sticky bottom. *Or, wishing to enter the Inner Harbor,* continue the course (**S. by W.**) until abreast of the wharf at the Torpedo Station, when haul up for the city, and anchor in from seven to fifteen feet, soft bottom.

Or, on the NE. $\frac{2}{3}$ E. course for the red spar-buoy on St. Patrick's Rock, when Rose Island Light-house bears **W. by N. $\frac{3}{4}$ N.**, round Goat Island Light-house at a distance of two hundred and fifty yards, and when past it, with the passage well open, steer **S. by W.** into the harbor, as before.

The above courses pass nearly three-eighths of a mile to the eastward of The Dumplings; eight hundred yards to the eastward of the spindle on Rose Island Point; a quarter of a mile to the eastward of the fourteen feet spot lying **E. $\frac{1}{4}$ S.** from that spindle; six hundred yards to the southward and eastward of the black spar-buoy on Tracey's Ledge; and a quarter of a mile to the southward of the red spar-buoy on St. Patrick's Rock.

DANGERS

IN APPROACHING AND ENTERING NEWPORT HARBOR.

III. From the Northward, by the Northern Passage.—Vessels from the upper part of the bay, intending to enter Newport Harbor, must, when off the southern end of Gould Island, steer **S. $\frac{1}{2}$ E.**

On this course there are no dangers; but if standing to the eastward on a wind vessels must beware of The Sisters, a small detached rocky shoal, lying on the edge of the eighteen feet curve about an eighth of a mile from Coddington Point, and bare at low spring tides. *The Sisters.* A red spar-buoy, marked No. 10, is placed in eighteen feet on the western side of the shoal, and bears from the southern extremity of Gould Island **SE. $\frac{1}{2}$ E.**, three-quarters of a mile, and from Coddington Point **NW. by W. $\frac{1}{2}$ W.**, an eighth of a mile distant. The sailing-line passes about seven hundred yards to the westward of this buoy and the shoal is not, therefore, in the way of vessels unless they are beating; in which case, to avoid it, Coddington Point must not be approached nearer than three hundred and fifty yards.

When abreast of the red spar-buoy on The Sisters there will be seen nearly ahead, but a little to the eastward of the course, a red can-buoy.* This is on Bishop Rock Shoal, a small detached shoal spot having only eight and a half feet upon it at mean low water and distant from Bishop Rock a little over three hundred yards. The buoy is a can of the second class, marked No. 8, placed off the southwestern end of the shoal in three fathoms water, and bears from the red spar-buoy on The Sisters **SW. $\frac{3}{4}$ S.**, eight hundred and twenty-five yards, and from the southeastern extremity of Gould Island **S. by E. $\frac{1}{2}$ E.**, nearly seven-eighths of a mile distant. Between the shoal and Bishop Rock there exists a narrow channel, one hundred and fifty yards wide, with five fathoms in it. *Bishop Rock Shoal.*

To avoid Bishop Rock Shoal vessels must not, when in its vicinity, stand to the eastward of Rose Island Light-house bearing **SW. by S. $\frac{1}{2}$ S.**

When past Bishop Rock Shoal the channel is clear and there are no dangers until well past the northern end of Coasters' Harbor Island; when there will be seen ahead, but a little to the westward of the course, a black spar-buoy, and to the westward of this two red spar-buoys. These latter are on Rose Island North Shoal, an extensive piece of shoal ground making off from the northern end of Rose Island,—its northern extremity, upon which there is nine and a half feet, being distant a little over a quarter of a mile. A depth of from six to eighteen feet is found upon this shoal, with occasional shoal spots of five feet. The easternmost buoy is placed on the northeastern extremity of the shoal in two fathoms, is marked No. 6, and bears from the red can-buoy on Bishop Rock Shoal **SSW.**, three-quarters of a mile, and from Goat Island Light-house **NW. by N. $\frac{1}{2}$ N.**, nearly seven-eighths of a mile distant. The westernmost buoy is placed on the northern end of the shoal in eighteen feet water, is marked No. 4, and bears from the easternmost buoy **W. by S. $\frac{1}{2}$ S.**, four hundred yards distant. Between these two buoys a channel about two hundred yards wide, with eighteen feet at mean low water in it, exists; but no stranger should attempt it. *Rose Island North Shoal.*

The black spar-buoy seen nearly ahead is on the northern end of Gull Rocks Shoal,—a rocky shoal nearly four hundred yards long in a **N. by E.** and **S. by W.** direction, about one hundred yards wide in its widest part, and surrounded upon all sides by deep water. Near its centre lie two large bare rocks known as **Gull Rocks**, from which the shoal takes its name. *Gull Rocks Shoal.* The buoy is marked No. 5, placed in nineteen feet water, and bears from the red spar-buoy on the northeastern end of Rose Island North Shoal **E. by S. $\frac{1}{4}$ S.**, four hundred and fifty yards, and from Goat Island Light-house **N. by W. $\frac{1}{2}$ W.**, a little over five-eighths of a mile distant. The sailing-line passes to the eastward of the buoy, between it and the southern end of Coasters' Harbor Island.

Between Gull Rocks Shoal buoy and the buoy on the northeastern end of Rose Island North Shoal leads a channel about four hundred yards wide with a depth of from five to seven fathoms. It is not, however, advisable for strangers to attempt this channel, as *shoal ground makes off to the eastward* from Rose Island for nearly a quarter of a mile,—thus contracting the width of the channel (between Tracey's Ledge and the eastern edge of this shoal ground) to about two hundred yards.

When past Gull Rocks Shoal a red spar-buoy will be seen close in with the eastern side of the passage and distant from shore about one hundred and seventy-five yards. This is on St. Patrick's Rock,—a sunken rock, with only eight feet at mean low water upon it, lying exactly on the edge of the eighteen feet curve. The buoy, which is marked No. 4, is placed on the western side of the rocks, close-to, and bears from the black spar-buoy on Gull Rocks Shoal **SE.**, half a mile, and from Goat Island Light-house **NE. by N. $\frac{1}{4}$ N.**, three-eighths of a mile distant. *St. Patrick's Rock.*

The sailing-line passes to the westward of St. Patrick's Rock, and when abreast of the buoy the black spar-buoy on Tracey's Ledge will be seen on the western side of the passage, bearing about **W. $\frac{1}{4}$ S.** Tracey's Ledge is a small detached shoal spot having only nine and a half feet upon it, and surrounded upon all sides by deep water. The buoy is marked No. 3, placed in four and a half fathoms on the western side of the ledge, and bears from the red spar-buoy on St. Patrick's Rock **W. $\frac{3}{4}$ N.**, eight hundred and seventy-five yards, and from Goat Island Light-house **NW. by N.** Nearly, about the same distance. *Tracey's Ledge.*

The sailing-line passes well to the eastward of Tracey's Ledge and leads directly for the entrance to the harbor, passing about midway between Goat Island Light-house and the wharf-line of the

northern part of the city. Vessels drawing over fifteen feet must not approach Goat Island Light-house nearer than two hundred yards, as only sixteen feet is found at that distance from it. After passing the light-house there are no dangers,—it being only necessary to keep in the middle of the channel. Anchorage will be found anywhere, in from three to three and three-quarter fathoms, after passing Goat Island Light-house.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING NEWPORT HARBOR.

IV. From the Northward, by the Northern Passage.—Vessels from the upper part of the bay must bring the southern extremity of Gould Island to bear **W.** by **N.** $\frac{3}{8}$ **N.**, three hundred yards distant, and Goat Island Light-house **S.** $\frac{1}{2}$ **E.**, with seventeen fathoms water, and steer **S.** $\frac{1}{2}$ **E.** for the light-house, passing about one hundred yards to the westward of the red can-buoy on Bishop Rock Shoal and carrying not less than six fathoms water. On this course, when Rose Island Light-house bears **SW.** by **W.** **Westerly** and the black spar-buoy on the northern end of Gull Rocks Shoal is in range with the red spar-buoy on the northeastern end of Rose Island North Shoal, in five fathoms water, steer **S.** by **E.** $\frac{7}{8}$ **E.** **Nearly**, carrying not less than three fathoms. When Goat Island Light-house bears **SW.** by **W.**, three hundred and fifty yards distant, and Rose Island Light-house **W.** $\frac{7}{8}$ **N.**, a little over five-eighths of a mile distant, steer **S.** by **W.** into the harbor, anchoring anywhere, after passing the light-house, in from three to three and three-quarter fathoms, sticky bottom. *Or, wishing to enter the Inner Harbor*, continue the course until abreast of the wharf at the Torpedo Station, when haul up for the city and anchor in from seven to fifteen feet, soft bottom.

The above courses pass seven hundred yards to the westward of the red spar-buoy on The Sisters; one hundred yards to the westward of the red can-buoy on Bishop Rock Shoal; one hundred and sixty-five yards to the eastward of the black spar-buoy on Gull Rocks Shoal; an eighth of a mile to the westward of the red spar-buoy on St. Patrick's Rock; five hundred and seventy-five yards to the eastward of the black spar-buoy on Tracey's Ledge; and two hundred yards to the eastward of Goat Island Light-house.

Vessels bound from Newport Harbor to the northward or upper part of the bay have only to *reverse* the above courses for entering by the Northern Passage.

LIGHT-HOUSES.

NAME.	Latitude.	Longitude West.			Fixed or Revolving.	Height above sea-level.	Distance visible in nautical miles.
		In arc.		In time.			
	° ' "	° ' "	h. m. s.		Feet.		
Rose Island Light-house	41 29 42	71 20 34	4 45 22	Fixed red.	58	11	
Goat Island Light-house	41 29 34	71 19 38	4 45 18	Fixed.	33	11	
Lime Rock Light-house	41 28 37	71 19 35	4 45 18	Fixed red.	30	11	

TIDES.

Corrected Establishment	7 ^b 45 ^m
Mean Rise and Fall of tides	3.9 ft.
Mean Rise and Fall of Spring tides	4.2 ft.
Mean Rise and Fall of Neap tides	3.6 ft.
Mean duration of Rise	6 ^b 30 ^m
Mean duration of Fall	5 ^b 55 ^m
Mean duration of Stand	0 ^b 35 ^m

VARIATION OF THE COMPASS.

The magnetic variation for Newport Harbor was, in 1876, 10° **W.**, with an annual increase of 2 $\frac{1}{4}$ '. This gives, for 1880, variation 10° 10' **W.**

DUTCH ISLAND HARBOR.

This harbor lies in the Western Passage, and is a semicircular indentation making into the western side of Conanicut Island about three miles above Beaver Tail Light-house. It is contained between Dutch Island on the west, the northern end of The Beaver Tail peninsula on the south, and Conanicut Island on the east. It may be entered by passing either to the northward or the southward of Dutch Island; but the latter passage is the one most commonly used by vessels coming from seaward. The harbor affords excellent anchorage in from two to eight fathoms, sticky bottom, and is easy of access.

On approaching the harbor from the southward the most conspicuous object visible is Dutch Island Light-house, on the southern end of Dutch Island. This island is of irregular shape, about five-eighths of a mile long in a N. by E. and S. by W. direction, and seven hundred yards wide in its widest part. It is about sixty feet high, smooth, grassy and gently sloping, and under cultivation except its summit, where there is a large earthwork and a number of houses near it, forming the barracks and laborers' quarters,—giving it the appearance of a large settlement. From the southern end of the island a long low point makes off, forming the site of Dutch Island Light-house. It will appear as a square brick tower, painted white, and attached to the keeper's dwelling, which is whitewashed. It shows a fixed white light, of the fourth order, from a height of fifty-six feet above the sea, visible thirteen miles. Its geographical position is

Latitude 41° 29' 46" N.
 Longitude 71° 24' 16" W.

A fog-bell, struck by machinery at intervals of fifteen seconds, is attached to the light-house.

Dutch Island Light-house bears from Beaver Tail Light-house N. $\frac{1}{2}$ E., nearly two miles and seven-eighths, and from the wharf at South Ferry (nearly opposite) E. $\frac{1}{2}$ N. Nearly, distant a little over three-quarters of a mile. From this light-house the red spar-buoy on Dutch Island Middle Ground bears E. by S. $\frac{1}{2}$ S., distant a quarter of a mile, which is here the width of the channel into the harbor.

The southern point of entrance to Dutch Island Harbor is formed by the northern end of The Beaver Tail peninsula, known as Beaver Head. It is about thirty feet high, with precipitous rocky faces, and a nearly level summit composed entirely of rich grass land. Between it and the southern end of Dutch Island the southern passage into the harbor is about five hundred yards wide and has not less than six fathoms.

The shores of the harbor, when up with Beaver Head, will appear as land mostly cleared and cultivated, rising with a very gentle slope to the higher lands beyond and showing occasional groves of trees.

The eastern and southern sides of Dutch Island Harbor shoal gradually from three fathoms to thirteen feet,—the latter depth being found, in some places, about one hundred yards from shore. Vessels must not, however, approach the northern side of The Beaver Tail peninsula nearer than three hundred yards,—at which distance a depth of twelve feet is found.

DANGERS

IN APPROACHING AND ENTERING DUTCH ISLAND HARBOR.

I. *From the Southward.*—After rounding Point Judith vessels must steer for Beaver Tail Light-house. On this course there are no dangers until nearly up with the entrance to the Western Passage, when care must be taken not to approach Beaver Tail Point nearer than three hundred and twenty-five yards in order to avoid Newton's Rock, a dangerous bare rock lying an eighth of a mile SW. by S. $\frac{1}{2}$ S. from the light-house and surrounded by shoal water. A can-buoy of the second class, painted red and black in horizontal stripes, is placed in six fathoms, rocky bottom, about four hundred yards SW. from the rock; and it bears from Brenton's Reef Light-vessel NW. $\frac{1}{4}$ N., a mile and three-eighths, and from Beaver Tail Light-house SW. $\frac{1}{2}$ S., six hundred yards distant.

On the western side of the passage, distant from the shore about three-eighths of a mile, will be seen Whale Rock, a large bare rock, surrounded on all sides by deep water, and easily recognized by reason of its being whitewashed. It bears from

The horizontally striped buoy off Newton's Rock, W. $\frac{3}{4}$ N.	nearly	1	Miles.
Brenton's Reef Light-vessel, NW. by W. $\frac{1}{4}$ W.	about	2 $\frac{1}{4}$	
Beaver Tail Light-house, W. $\frac{1}{2}$ S.		1 $\frac{1}{8}$	

To the westward of this rock the shore should not be approached nearer than five hundred yards, as it is very shoal and strewn with bare and sunken rocks.

On the western side of the passage, distant from Whale Rock a little over a mile in a N. by E. $\frac{1}{8}$ E. direction and about three-eighths of a mile from shore, lies Jones' Ledge, a small detached rocky shoal having only nine feet at mean low water upon it, with from six to seven fathoms on all sides. It is not buoyed. From Beaver Tail Light-house it bears NW. $\frac{1}{2}$ N., a little over a mile and an eighth, and from Dutch Island Light-house SW. by S. $\frac{1}{2}$ S., nearly two miles and a quarter distant. The main portion of the channel passes to the eastward of this ledge and it is not, therefore, in the way of vessels unless they are standing to the westward on a wind; in which case, to avoid it they must not, when in its vicinity, stand to the westward of Dutch Island Light-house bearing NE. by N. $\frac{5}{8}$ N.

The western shore of The Beaver Tail from the light-house to Beaver Head, a little over two and a half miles above, is tolerably bold-to, and may be safely approached to within two hundred and fifty yards with not less than four fathoms,—except in the vicinity of Austin's Hollow, which makes into the western shore of The Beaver Tail about one mile above Beaver Tail Point. When in this vicinity, if bearing, vessels must go about as soon as they strike four fathoms,—as only twelve feet is found at a distance of four hundred and fifty yards from the shore of the Hollow.

The western side of the passage from abreast of Austin's Hollow to a point directly opposite Beaver Head is bold-to and may be approached with safety to within two hundred and fifty yards,—at which distance a depth of from three to four and a half fathoms will be found. Good anchorage is found anywhere along this shore, with the above depth of water and firm holding-ground.

When within about half a mile of Dutch Island Light-house the course changes more to the eastward,—leading directly into the harbor. On this course there will be seen ahead, bearing about NE. $\frac{3}{4}$ E., a red spar-buoy. This is on Dutch Island Middle Ground, (or *Beaver Tail Point Shoal*), making off to the northward from Beaver Head for three hundred and fifty yards, with seven feet at mean low water upon it and from eight to ten fathoms just outside *Dutch Island Middle Ground*. its northern and western edges. The buoy is marked No. 2, placed in three fathoms on the northern edge of the shoal, and bears from Dutch Island Light-house E. by S. $\frac{3}{4}$ S., distant a quarter of a mile, which is here the width of the channel. Coming into the harbor, Beaver Head must be given a berth of at least two hundred yards until up with the red buoy above mentioned. On the opposite side of the entrance Dutch Island Light-house must not be approached nearer than one hundred and fifty yards—at which distance three fathoms will be found.

When past the red buoy on Dutch Island Middle Ground vessels may anchor close under the eastern face of Dutch Island in from six to seven fathoms, sticky bottom; or, haul up for the head of the harbor and anchor in from fifteen feet to eight fathoms, soft bottom.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING DUTCH ISLAND HARBOR.

I. From the Southward.—Vessels which have come from the southward and intend to enter Dutch Island Harbor must round Point Judith at a distance of about a mile, with seven fathoms water, and steer NE. $\frac{1}{2}$ N., heading directly for Beaver Tail Light-house and carrying not less than seven fathoms. When within three-quarters of a mile of the light-house, with Brenton's Reef Light-vessel bearing SE. by E. $\frac{3}{4}$ E., one and three-eighths miles distant, steer N. by E. up the passage, carrying not less than four and a half fathoms. On this course, when Dutch Island Light-house bears NE. by N. $\frac{3}{4}$ N., nearly half a mile distant, in seven and a quarter fathoms, steer NE. $\frac{1}{4}$ E. into the harbor, passing to the northward and westward of the red spar-buoy on Dutch Island Middle Ground and carrying not less than seven fathoms water. When past the buoy anchor in from three and a half to eight fathoms, sticky bottom; or, haul up for the head of the harbor, and anchor in from fourteen to eighteen feet at a distance of five hundred yards from shore.

The above courses pass four hundred and fifty yards to the westward of the horizontally striped buoy off Newton's Rock; about three-quarters of a mile to the eastward of Whale Rock; a little over half a mile to the eastward of Jones' Ledge; three hundred and twenty-five yards to the westward of Beaver Head; a little over an eighth of a mile to the eastward of Dutch Island Light-house; and one hundred and forty yards to the westward of the red spar-buoy on Dutch Island Middle Ground.

Vessels coming from the Eastward, intending to make Dutch Island Harbor, must, when up with Brenton's Reef Light-vessel, steer NW., carrying not less than nine fathoms, and passing a little over one hundred yards to the southward of the horizontally striped buoy off Newton's Rock. Continue this course until Beaver Tail Light-house bears E. by N. $\frac{1}{2}$ N., a little over three-eighths of a mile distant, when steer N. by E. up the passage, as before, following the directions given above.

DANGERS

IN APPROACHING AND ENTERING DUTCH ISLAND HARBOR.

II. From the Northward.—Vessels from the upper part of the bay will meet with no obstructions until about one mile and three-quarters to the southward of North Point of Conanicut Island.

Great Ledge. Here it will be necessary to beware of Great Ledge, extending along the western shore of the island to the southward for about two miles and making off to the westward for distances varying from one hundred and seventy-five yards to a quarter of a mile. It has from two to fifteen feet upon it and is strewn with dangerous bare and sunken rocks. A good rule to avoid this ledge, when beating, is to go about immediately on striking four fathoms; and this rule is imperative, as the water shoals abruptly in some places from four fathoms to four feet.

When about two miles and a quarter to the southward of North Point there will be seen ahead, nearly in the middle of the passage, a black nun-buoy.* This is on Plum Beach Shoal, making off from the western shore for a little over half a mile with an average width of three-eighths of a mile and soundings upon it varying from two to sixteen feet. The buoy is a nun of the second class, marked No. 1, placed in fifteen feet, hard bottom, on the *Plum Beach Shoal*.

eastern extremity of the shoal, and bears from the northwestern end of Dutch Island N. $\frac{3}{4}$ E., a little over a mile and a quarter distant. Between the buoy and the shore to the westward of it a channel about seven hundred yards wide crosses the shoal with from twelve to sixteen feet.

The sailing-line passes to the eastward of this buoy and when past it leads directly for the northern entrance to the harbor, passing to the eastward of the northern end of Dutch Island and carrying not less than three and a half fathoms. The channel is perfectly clear and unobstructed,—it being only necessary, if beating, not to approach the northern and eastern sides of Dutch Island nearer than two hundred yards.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING DUTCH ISLAND HARBOR.

II. *From the Northward.*—Vessels from the upper part of the bay must bring the northern end of Conanicut Island to bear E. $\frac{3}{4}$ S., a little over five-eighths of a mile distant, and Poplar Point Light-house (at the entrance to the Inner Harbor of Wickford) W. $\frac{3}{4}$ N., nearly two miles and three-eighths distant, and steer SW. by S. $\frac{1}{4}$ S., carrying not less than four fathoms water. On this course, when abreast of the black nun-buoy on Plum Beach Shoal, distant from it about two hundred yards, with Dutch Island Light-house bearing S. by W. $\frac{3}{4}$ W., steer S. $\frac{1}{2}$ E. for the entrance to the harbor, carrying not less than three and a half fathoms. When past the northern end of Dutch Island and well in the harbor, anchor in from three and a half to eight fathoms, soft bottom; or, haul over towards the head of the harbor, anchoring when within four hundred and fifty yards of the shore in from thirteen to sixteen feet, soft bottom.

The above courses pass a little over five-eighths of a mile to the westward of North Point; three hundred yards to the westward of the northern end of Great Ledge; two hundred and fifty yards to the eastward of the black nun-buoy on Plum Beach Shoal; and four hundred yards to the eastward of the northeastern end of Dutch Island.

Vessels leaving Dutch Island Harbor bound for the upper part of the bay have only to reverse the above courses.

LIGHT-HOUSE.

NAME.	Latitude.	Longitude West.			Fixed or Revolving	Height above sea-level.	Distance visible in nautical miles.
		In arc.		In time.			
	° ' "	° ' "	h. m. s.		Feet.		
Dutch Island Light-house	41 29 46	71 24 16	4 45 37	Fixed.	56	13	

TIDES.

Corrected Establishment	7 ^h 44 ^m
Mean Rise and Fall of tides	4.0 ft.
Mean Rise and Fall of Spring tides	4.2 ft.
Mean Rise and Fall of Neap tides	3.8 ft.
Mean duration of Rise	6 ^h 15 ^m
Mean duration of Fall	6 ^h 10 ^m
Mean duration of Stand	0 ^h 5 ^m

VARIATION OF THE COMPASS.

The magnetic variation at Dutch Island Harbor for 1876 was 9° 57' W., with an annual increase of 2 $\frac{1}{2}$ '. This will make the variation for 1880 10° 7' W.

WICKFORD HARBOR

is a wide cove, indenting the western shore of the bay directly opposite the northern end of Conanicut Island, and is contained between Quonset Point on the north and Wild Goose Point on the south; and between these two points is a little over two miles wide, but rapidly diminishes in width until at Poplar Point, where the Inner Harbor begins, it is only about three-eighths of a mile wide. Many ledges and sunken rocks lie off and extend along both shores, but most of them are buoyed.

Wild Goose Point, the southern point of entrance to Wickford Harbor, is a low rocky point, covered with grass, and has a grove of low bushy trees upon it,—its summit rising to a height of about twenty feet and perfectly bare.

The point is shoal and must not be approached by vessels drawing twelve feet nearer than two hundred and Wild Goose Point. fifty yards; but the lead will be the best guide, as the soundings decrease very gradually. The best channel into Wickford Harbor is between this point and James' Ledge, (which will be easily recognized by the black nun-buoy* upon it,) and has a width of about three-quarters of a mile, with a depth of not less than fourteen feet at mean low water, as far up as Poplar Point, at the entrance to the Inner Harbor.

Quonset Point, the northern point of entrance to the harbor, is a very low, sandy point, backed by low, flat, cleared, grassy land, interspersed with occasional groves of trees and dotted with houses. It is dangerous to approach this point nearer than four hundred yards,—a depth of only twelve feet being found at a distance of three hundred yards from it.

Poplar Point, the southern point of entrance to the Inner Harbor of Wickford, is easily recognized by **Poplar Point Light-house**, built on its eastern extremity. The light is on the keeper's dwelling, (which is whitewashed,) and is a fixed white light, of the fifth order, shown from a height of fifty-one feet above the sea, visible thirteen miles. Its geographical position is

Latitude 41° 34' 14" N.
Longitude 71° 26' 22" W.,

and it bears from

	Miles.
North Point, W. $\frac{3}{4}$ N.	about 3
The black nun-buoy on James' Ledge, W. $\frac{3}{4}$ N.	nearly 1 $\frac{1}{2}$
Wild Goose Point, N. by W. $\frac{1}{4}$ W.	a little over $\frac{1}{2}$
Quonset Point, SW. by W. $\frac{3}{4}$ W.	a little over 1

The northern shore of the harbor, from Quonset Point to the westward, has a general course about W. by S. for one and five-eighths miles,—terminating in a low grassy point, called **Sauga Point**, directly opposite Poplar Point Light-house. To the westward of this point makes in a small shallow cove, of no importance, called **Fishing Cove**. To the westward of this, and separated from it by a small marshy island, called **Cornelius' Island**, is another shallow cove, known as **Mill Cove**. This cove runs in a nearly due N. direction for about three-quarters of a mile and seven feet may be taken into it through a narrow shoal about fifty yards wide.

After passing Poplar Point Light-house the **Inner Harbor** begins and extends in a S. by W. direction for three-eighths of a mile and has a width of from seventy-five to three hundred yards. Not more than ten feet can be taken up to the long wharf at the eastern end of the village of **Wickford**, which occupies the entire northern and western sides of the harbor. No stranger should attempt to enter the harbor of Wickford without a pilot. Anchorage may be found in the Outer Harbor after passing James' Ledge buoy.

DANGERS

IN APPROACHING AND ENTERING WICKFORD HARBOR.

I. From the Southward.—On the N. by E. course through the Western Passage, when past the northern end of Dutch Island there will be seen ahead, nearly in the middle of the channel, a black nun-buoy.* This is on Plum Beach Shoal, making off from the western shore for a little over half a mile with an average width of three-eighths of a mile, and has soundings upon it varying from two to sixteen feet. The buoy is a nun of the second class, marked No. 1, placed in fifteen feet, hard bottom, on the eastern extremity of the shoal, and bears from the northwestern end of Dutch Island N. $\frac{3}{4}$ E., a little over one mile and a quarter, and from Poplar Point Light-house S SE., three miles distant. Between the buoy and the shore to the westward of it a channel about seven hundred yards wide crosses the shoal with from twelve to sixteen feet.

Vessels pass to the eastward of the black nun-buoy on Plum Beach Shoal; but, if beating, they must be careful not to approach the western shore of Conanicut Island nearer than three hundred and fifty yards in order to avoid Great Ledge, which extends along this shore for about two miles and makes off to the westward for distances varying from one hundred and seventy-five yards to a quarter of a mile. It has from two to fifteen feet upon it, and many dangerous bare and sunken rocks lie scattered along its length. A good rule to avoid this ledge, when beating, is to go about immediately on striking four fathoms;—and this rule is imperative, as the water shoals abruptly in some places from four fathoms to four feet.

When past the black nun-buoy on Plum Beach Shoal the course turns more to the westward and there will be seen ahead, bearing about N. by W. and distant a little over one mile and five-eighths, a black spar-buoy. This buoy is on Fox Island Shoal, surrounding Fox Island,—a small low island with a few trees near its centre and distant from shore about half a mile. From its eastern side the shoal makes off to a distance of about two hundred yards and from its southern side to a distance of about a quarter of a mile, with depths upon it varying from four to twelve feet. The buoy is marked No. 3, placed in three fathoms off the eastern end of the shoal, and bears from the black nun-buoy on Plum Beach Shoal N. $\frac{3}{4}$ W., one and five-eighths miles, and from Poplar Point Light-house SE. $\frac{3}{4}$ E., one mile and a half distant. When to the southward of this buoy vessels must not go farther to the westward than to bring it to bear N. by E., as the area inside this bearing is shoal and strewn with bare and sunken rocks.

When up with the black spar-buoy on Fox Island Shoal there will be seen to the northward, distant one mile, the black nun-buoy* on James' Ledge, the southern extremity of a mass of dry flats, bare rocks and sunken ledges making off from the mainland west of Quonset Point for a distance of nearly one mile. The ledge has two feet upon it at mean low water,

and the buoy (which is marked No. 5) is placed in twelve feet just to the eastward of *Dangers--Wickford Harbor*. This buoy bears from Poplar Point Light-house **E. $\frac{1}{2}$ S.**, one mile and a quarter, and from the black spar-buoy on Fox Island Shoal **N. by E. $\frac{3}{4}$ E.**, distant a little over a mile, which is here the width of the channel leading into the harbor.

To the northward and westward of James' Ledge buoy will be seen a granite structure surmounted by an iron spindle with square cage on top. This is **White Rocks Beacon**, on *White Rocks*, dry at mean low water. To the northward of this beacon will be seen three spar-buoys,—two red and one black. The red buoys mark, respectively, *Manney Rock*, with three feet, and *Bill Dyer's Rock*, with four feet at mean low water. The black buoy is on *Flat Rock*, dry at low spring tides. Between these buoys and James' Ledge leads a channel, a little over three hundred yards wide, through which not less than eleven feet may be taken; but under no circumstances should strangers attempt to pass through it.

James' Ledge and the rocks and shoals to the northwestward of it are not in the way unless vessels are standing to the northward on a wind. In such a case, a good rule to avoid them is not to go to the northward of Poplar Point Light-house bearing **W. by N. $\frac{1}{8}$ N.** until past James' Ledge.

When abreast of the black spar-buoy on Fox Island Shoal the course changes more to the northward, running about **NW. by N.** On this course there are no dangers; but if vessels are beating they must be careful not to stand to the westward of Poplar Point Light-house bearing **NW. $\frac{1}{2}$ N.**,—the space inside this bearing being very shoal, with outlying rocks and sunken ledges. Of these ledges the most important are *Wild Goose Ledge* and *Cedar Swamp Ledge*, off Wild Goose Point; *Sassamore Rock*, half a mile to the northwestward of Wild Goose Point and two hundred and fifty yards from shore; and *Cold Spring Rock* and *Half-Way Rock*, with two and three feet, respectively, which lie off *Cold Spring Beach*,—the former being three-eighths of a mile and the latter a quarter of a mile to the southeastward of Poplar Point.

When abreast of Wild Goose Point a red spar-buoy and a dolphin or pile will be seen ahead, lying directly in the middle of the entrance to the Inner Harbor and nearly in range with each other. The dolphin, which is first met with, is on *Old Gay Rock*, a sunken rock with two feet at mean low water upon it, and forming the northern extremity of the shoal ground *Old Gay Rock*, making off from Poplar Point. It is placed on the northern side of the rock in nine feet water, marks the southern limits of the channel, and bears from James' Ledge buoy **W. by N. $\frac{3}{8}$ N.**, one mile and an eighth; from Fox Island Shoal buoy **NW. by N. $\frac{1}{4}$ N.**, one mile and a half; and from Poplar Point Light-house **NE. by E.**, three hundred and twenty-five yards distant. Here the channel is very narrow,—being only about one hundred and twenty-five yards wide, but has not less than thirteen feet in it.

The red spar-buoy is on *Charles' Rock*, a sunken rock, with four feet at mean low water upon it, lying exactly upon the edge of the channel. The buoy is placed just to the eastward of the rock in ten feet water, and bears from the dolphin on *Old Gay Rock* **NW. $\frac{3}{8}$ N.**, two hundred and twenty-five yards, and from Poplar Point Light-house **N. by E. $\frac{3}{4}$ E.**, four hundred yards distant. Just to the eastward of this buoy is a sunken rock, with seven and a half feet at mean low water, called *Van Buren's Rock*; and a short distance to the northward of the buoy is another rock, bare at low water, called *The Brothers*. Neither is buoyed, but they are easily avoided by passing to the southward of *Charles' Rock* buoy. The channel passes between this buoy and the dolphin on *Old Gay Rock* and continues to the westward for about a quarter of a mile, when it turns abruptly to the southward,—leading close along the wharf-line of the village of Wickford.

As before remarked, no stranger should attempt to enter this harbor without a pilot. Thirteen feet may be taken up to the red buoy on *Charles' Rock*; but not more than ten feet at mean low water can be carried up to the long wharf at the eastern end of the village.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING WICKFORD HARBOR.

I. *From the Southward*.—On the **NE. by N. $\frac{1}{8}$ N.** course up the Western Passage from off the northern end of Dutch Island, when abreast of the black nun-buoy on Plum Beach Shoal, distant from it about two hundred and twenty-five yards, with Poplar Point Light-House bearing **N NW.** and Dutch Island Light-house **S. by W. $\frac{1}{2}$ W.**, in three and three-quarter fathoms, steer **N. $\frac{1}{2}$ W.**, carrying not less than three and a half fathoms. On this course, when abreast of the black spar-buoy on Fox Island Shoal, distant from it about three hundred yards, with Poplar Point Light-house bearing **NW. $\frac{1}{2}$ N.**, steer **NW. by N. $\frac{3}{8}$ N.**, carrying not less than fifteen feet, until the light-house bears **W. by N. $\frac{1}{2}$ N.**, eight hundred yards distant. Here the depth will be fourteen feet and the course **NW. $\frac{1}{8}$ N.**, steering so as to pass about sixty yards to the northward of the dolphin on *Old Gay Rock*. When up with this buoy steer **NW. by W.**, passing to the southward of the red spar-buoy on *Charles' Rock* and

carrying not less than thirteen feet. Continue this course until the Inner Harbor is well open, when steer for the end of the long wharf at the eastern end of the village and anchor in from ten to thirteen feet, soft bottom.

The above courses pass two hundred and twenty-five yards to the eastward of the black nun-buoy on Plum Beach Shoal; a little over an eighth of a mile to the eastward of the black spar-buoy on Fox Island Shoal; a little over five-eighths of a mile to the southward and westward of James' Ledge; and about midway between the dolphin on Old Gay Rock and the red spar-buoy on Charles' Rock.

DANGERS

IN APPROACHING AND ENTERING WICKFORD HARBOR.

II. From the Northward.—Vessels from the upper part of the bay, when past the southern end of Hope Island, will see on the western side of the passage, close in with Quonset Point, a black spar-buoy. This is on the eastern end of Quonset Point Shoal, making off from that point for a little over an eighth of a mile, with from three to twelve feet at mean low water upon it and four and three-quarter fathoms just outside its eastern end. The buoy is placed in eleven feet, marked No. 7, and bears from the extremity of Quonset Point **SE. $\frac{1}{4}$ S.**, three hundred yards distant.

When up with the buoy on Quonset Point Shoal there will be seen, also on the western side of the passage, a spar-buoy painted red and black in horizontal stripes. This is on Brig Ledge, a small detached rocky shoal lying a little over a mile **SW. by S. $\frac{1}{4}$ S.** from Quonset Point and having twelve feet at mean low water upon it. The buoy is placed on the southwestern edge of the shoal in seventeen feet, and bears from Poplar Point Light-house **E. $\frac{1}{2}$ N.**, one mile and three-eighths, and from the black spar-buoy on Quonset Point Shoal **SW. $\frac{1}{4}$ S.** five-eighths of a mile distant.

To the westward of Brig Ledge buoy will be seen three spar-buoys—two red and one black. The easternmost red buoy is on *Bill Dyer's Rock*, with four feet; the black buoy marks *Flat Rock*, dry at low water; and the westernmost red buoy is on *Manney Rock*, with three feet at low water. To the southward of this last-mentioned buoy will be seen an iron spindle surmounted by a square cage. This is *White Rocks Beacon*, on *White Rocks*, also dry at low water. These dangers are not in the way of vessels, as under no circumstances should they go inside of the line between Quonset Point Shoal buoy and Brig Ledge. Narrow channels lead between the above-mentioned buoys into the Outer Harbor of Wickford; but no one except the local pilots can use them, for whose convenience the dangers were buoyed.

About one hundred yards to the northeastward of the red buoy on Bill Dyer's Rock lies *Black Rock*, bare at low water and not buoyed; and to the northward of Manney Rock, at distances, respectively, of one hundred and two hundred yards, lie *Vial's Creek Ledge*, bare at low springs, and *Coon's Ledge*, with four feet at low water. Neither is buoyed. A slue channel with not less than seven feet at low water leads between Black Rock, Bill Dyer's Rock, and Flat Rock on the east, and Coon's Ledge, Vial's Creek Ledge, and Manney Rock on the west; but it is not fit for strangers.

Nearly three-eighths of a mile **SW. by S. $\frac{1}{2}$ S.** from the buoy on Brig Ledge will be seen the black nun-buoy* on James' Ledge, a detached shoal spot, with two feet at mean low water upon it, lying about one hundred yards inside the eighteen feet curve. The buoy is a nun of the second class, marked No. 5, placed in twelve feet just to the eastward of the ledge, and bears from Poplar Point Light-house **E. $\frac{1}{2}$ S.**, one mile and a quarter, and from Wild Goose Point **NE. $\frac{1}{2}$ E.**, one mile and an eighth distant. After rounding this buoy the course leads directly for Poplar Point Light-house and the dangers are the same as those previously described for entering the harbor from the southward.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING WICKFORD HARBOR.

II. From the Northward.—Vessels from the upper part of the bay must bring the southern end of Hope Island to bear **E. by S. $\frac{1}{2}$ S.** Nearly, a quarter of a mile distant, and Poplar Point Light-house **W. by S. $\frac{1}{4}$ S.**, three and one-eighth miles distant, in three and a half fathoms, and steer **SW. $\frac{1}{2}$ W.**, passing about one hundred yards to the eastward of James' Ledge buoy and carrying not less than three fathoms. Continue this course until Poplar Point Light-house bears **W. by N. $\frac{1}{2}$ N.**; when steer that course, carrying not less than fifteen feet, until within about eight hundred yards of the light-house. Here the depth will be fourteen feet and the course **NW. $\frac{1}{4}$ N.**, following the directions previously given.

WICKFORD HARBOR.

The above courses pass six hundred and fifty yards to the eastward of the black spar-buoy on Quonset Point Shoal; four hundred yards to the eastward of the horizontally striped buoy on Brig Ledge; and one hundred yards to the eastward of the black nun-buoy on James' Ledge.

Vessels which have come from the Eastern Passage of Narragansett Bay, intending to enter Wickford Harbor, must bring North Point of Conanicut Island to bear S. by W. $\frac{3}{4}$ W., three hundred yards distant, and Poplar Point Light-house W. $\frac{3}{4}$ N., a little over three miles distant, in three and three-quarter fathoms, and steer W. $\frac{1}{2}$ S.; which course will lead, with not less than three and a quarter fathoms, up to the black nun-buoy on James' Ledge, passing about three hundred yards to the southward of it. On this course, when Poplar Point Light-house bears W. by N. $\frac{1}{2}$ N. steer for it, following the directions previously given.

LIGHT-HOUSE.

NAME.	Latitude.	Longitude West.			Fixed or Revolving.	Height above sea-level.	Distance visible in nautical miles.
		In arc.		In time.			
	° ' "	° ' "	h. m. s.		Feet.		
Poplar Point Light-house	41 34 14	71 26 22	4 45 45	Fixed.	51	13	

TIDES.

Corrected Establishment	7 ^h 56 ^m
Mean Rise and Fall of tides	4.2 ft.
Mean Rise and Fall of Spring tides	4.4 ft.
Mean Rise and Fall of Neap tides	4.0 ft.
Mean duration of Rise	7 ^h 21 ^m
Mean duration of Fall	5 ^h 4 ^m

VARIATION OF THE COMPASS.

The magnetic variation in Wickford Harbor for 1876 was 10° 0' W., with an annual increase of 2 $\frac{1}{2}$ '; which will give, for 1880, variation 10° 10' W.

GREENWICH BAY

is situated at the northwestern end of Narragansett Bay, and makes in to the northwestward, between Warwick Neck on the north and Potowomut Neck on the south, for about three miles and an eighth; and at its entrance is a little over one and a half miles wide. Ten feet at mean low water may be taken up to the western end of the bay, and the same depth can be taken to the anchorage off the town of East Greenwich, which is situated at its southwestern extremity. The channel, however, is much obstructed by rocks and ledges, and the best water at the entrance to the bay is found close under Warwick Neck.

Pojack Point, the southern point of entrance to Greenwich Bay, is low and sandy, backed by higher lands cleared and cultivated. Between it and Marsh Point, the southeastern extremity of Potowomut Neck, lies the entrance to Potowomut River,—a narrow shallow stream running in a westerly direction for about one mile and a quarter along the southern face of Potowomut Neck. Only four feet can be taken into it at mean low water, and it is of no importance.

Pojack Point.

Warwick Point, the southern extremity of Warwick Neck and the northern point of entrance to Greenwich Bay, is about forty feet high, and seen from the southward shows precipitous faces. To the eastward and northward groups of houses appear among the trees, with which the neck is dotted in groves. This point also forms the site of Warwick Light-house, a peculiar-looking tower attached to the southern end of the keeper's dwelling, which is painted white and has a red roof. It shows a fixed white light, of the fourth order, from a height of fifty-four feet above the sea, visible thirteen miles. Its geographical position is

Warwick Light-house.

Latitude	41° 39' 59" N.
Longitude	71° 22' 42" W.,

and it bears from

	Miles.
The spindle on Warwick Rock, NE. by E. $\frac{1}{4}$ E.	$\frac{3}{8}$
The black buoy on Quonset Point Shoal, NNE.	nearly 5
The northern end of Hope Island, N. $\frac{1}{4}$ E. Nearly	a little over 3 $\frac{1}{4}$

Nearly in the middle of the entrance to the bay, and about midway between Warwick Point and Pojack Point, will be seen an iron spindle surmounted by a square wooden cage. This is on Warwick or Spindle Rock, and is surrounded on all sides by dry rocks and sunken ledges.

From Warwick Point the western shore of Warwick Neck has a general course about **NW. $\frac{1}{2}$ N.** for five-eighths of a mile and then turns abruptly to the northward, running about **N. by E.** for the same distance to the mouth of **Old Warwick Cove**. All this western side of Warwick Neck is of moderate height, gently sloping, cleared and cultivated, and dotted with occasional groves of trees. Old Warwick Cove runs in about a **N. by E.** direction for nearly one mile, and has an average width of three hundred yards. Nine feet at mean low water can be taken into it.

From the mouth of Old Warwick Cove the shore runs about **W NW.** for half a mile to the entrance to **Brush Neck Cove**. This cove is separated from Old Warwick Cove by **Horse Neck**, and is narrow, shallow, and of no importance. About one mile and seven-eighths to the westward of this, in the extreme northwestern end of the bay, lies the entrance to **Apponaug River**. Apponaug River, also narrow and shallow, with only three and a half feet at mean low water in its mouth.

It runs in a nearly **NW.** direction for about five-eighths of a mile, when it becomes very narrow,—its width being only about twenty-five yards, and here it is crossed by a railroad bridge. About two hundred yards beyond this bridge, at the head of the river, is situated the village of **Apponaug**. All this northern shore of Greenwich Bay is cleared, under fine cultivation, and dotted with houses.

Potowomut Neck, the northern side of which forms the southern shore of the bay, is of moderate height, gently sloping, cleared, cultivated, and almost entirely bare of trees. From **Marsh Point**, its southeastern end, it runs about **N. by E.** for three-eighths of a mile to **Sandy Point**,—its northeastern extremity. Hence the northern shore of the neck has a general direction about **NW.** for seven-eighths of a mile to **Potowomut Point**, its extreme northern end. From this point the

Potowomut Neck shore curves away gradually to the southward, and then to the westward, for three-quarters of a mile, to **Long Point**, the eastern point of entrance to Greenwich Cove. All this shore, from **Sandy Point** to **Long Point**, is foul, and must not be approached nearer than six hundred yards until past Potowomut Point; when it may be approached within an eighth of a mile with not less than eight feet at mean low water. **Greenwich Cove** lies in the southwestern end of the bay, and runs in a southwesterly direction for about one mile and an eighth, with an average width of three hundred and twenty-five yards. On its western bank is built the town of **East Greenwich**.

The western shore of the bay, from the mouth of Apponaug River to East Greenwich, has a general direction about due **S.** and is of moderate height, in some places cleared and cultivated and in others showing occasional groves of trees. The highest land back of the shore rises to a height of one hundred and eighty feet, and partakes of the same general character as that just described. About three-eighths of a mile to the northward of the entrance to Greenwich Cove, and distant from shore about two hundred yards, lies a small island about two hundred and fifty yards long and one hundred yards wide, called **Chippanogset Island**. It is surrounded by shoals and must not be closely approached.

DANGERS

IN ENTERING GREENWICH BAY AND PASSING UP TO EAST GREENWICH.

Vessels from the southward intending to enter Greenwich Bay must bring Warwick Light-house to bear either **N. by E. $\frac{3}{8}$ E.** or due **N.** and steer for it. On either of these courses, when within about a mile of the light-house there will be seen to the westward, nearly in the middle of the entrance to the bay, an iron spindle surmounted by a square wooden cage. This is on **Warwick Rock**. Rock, (or *Spindle Rock* as it is sometimes called,) bare at low spring tides and surrounded upon all sides by dangerous bare and sunken rocks. *Crack Rock*, with five and a half feet, lies about seventy-five yards to the northwestward of the spindle; *Flat Rock*, bare at low springs, lies two hundred yards to the westward; *Round Rock*, with four feet, lies fifty yards to the southeastward; and a *six feet rock* two hundred yards to the northward. None of these are buoyed,—the spindle serving as a warning for all. The spindle bears from Warwick Light-house **SW. by W. $\frac{1}{2}$ W.**, seven-eighths of a mile, and from Pojack Point **E. by N. $\frac{1}{4}$ N.**, nearly three-quarters of a mile distant. About a quarter of a mile **SE. $\frac{1}{8}$ E.** from this spindle lies a detached sunken ledge, with twelve feet upon it at mean low water, called *Hunt's Ledge*. Vessels, in order to avoid the above dangers, must not, when in their vicinity, go to the westward of Warwick Light-house bearing **NE. $\frac{1}{8}$ N.** The sailing-lines pass, respectively, three-eighths and five-eighths of a mile to the eastward of *Hunt's Ledge*.

When within about five hundred yards of Warwick Light-house the courses unite and turn abruptly to the northwestward,—running about **NW. by W.** On this course there are no dangers; but vessels must not approach the southern and western faces of Warwick Neck nearer than two hundred yards, as a number of *bare rocks and sunken ledges* lie scattered along their length. Of these the most important is *Southeast Ledge*, with twelve feet at low water, which lies two hundred yards **S. by E.** from Warwick Light-house and is not buoyed.

When well past the light-house there will be seen, nearly ahead, the black spar-buoy on **Sandy Point Shoal**, making off from Sandy Point to the northeastward for five-eighths of a mile, with from three to eight feet upon it at mean low water. The buoy is placed on the northern edge of the shoal in ten feet, is marked No. 1, and bears from Warwick Light-house **W NW.**, a little over seven-eighths of a mile, and from the spindle on Warwick Rock **N. $\frac{1}{2}$ W.**, about the same distance. The sailing-line passes to the northward and eastward of this buoy, close-to.

When up with the buoy on Sandy Point Shoal the course changes more to the northward and there will be seen ahead, off Potowomut Point, a black spar-buoy. This is on Sally's Rock, a sunken rock with five feet at mean low water upon it and from twelve to fourteen feet on all sides. Just to the southward of it, about three hundred yards distant, lie the *Potowomut Rocks*,—sunken rocks with from three to ten feet upon them. The buoy is placed just to the northward of Sally's Rock in thirteen feet, is marked No. 3, and bears from Sandy Point Shoal buoy **W NW**. Nearly, one mile and a quarter, and from Potowomut Point **N**. by **E**. $\frac{1}{8}$ **E.**, four hundred and twenty-five yards distant. *Sally's Rock.*

The sailing-line rounds the buoy on Sally's Rock to the northward at a distance of about one hundred and fifty yards and leads directly for the red spar-buoy on Chippanogset Island Shoal, making off to the southward from Chippanogset Island for an eighth of a mile, and nearly bare at mean low water. The buoy is marked No. 2, placed off the southern edge of the shoal in ten feet water, and bears from Sally's Rock buoy **W**. by **S**. $\frac{1}{4}$ **S.**, nearly three-quarters of a mile, and from Potowomut Point **W**. $\frac{1}{2}$ **N.**, five-eighths of a mile distant. The sailing-line passes to the southward of the buoy, close-to. *Chippanogset Island Shoal.*

When past the buoy on Chippanogset Island Shoal vessels must steer so as to pass about fifty yards to the northward and westward of the black spar-buoy on Long Point Shoal. This shoal makes off from Long Point to the westward for three hundred yards and has from two to four feet at mean low water upon it. The buoy is placed on the western extremity of the shoal in ten feet, is marked No. 5, and bears from the red spar-buoy on Chippanogset Island Shoal **SW**. by **W**. $\frac{3}{4}$ **W.**, a little over a quarter of a mile, and from the southern end of Chippanogset Island **SW**. $\frac{3}{4}$ **S.**, seven hundred yards distant. The channel passes to the westward of this buoy, between it and the western shore of the cove, and has here a depth of seventeen feet. *Long Point Shoal.*

When past Long Point Shoal buoy there will be seen ahead a red spar-buoy. This is on Garden Flats, making off to the eastward for one hundred yards, and dry at mean low water. The buoy is placed on their eastern edge in eleven feet, is marked No. 4, and the sailing-line passes to the eastward of it, close-to. When past this buoy anchorage will be found in from seven to eleven feet, sticky bottom. *Garden Flats.*

Vessels which have no local pilots should not attempt the passage to East Greenwich. Anchorage may be found close under Warwick Neck, or farther up the bay in the vicinity of Sally's Rock buoy, in from ten to fourteen feet, sticky bottom.

SAILING DIRECTIONS

FOR ENTERING GREENWICH BAY AND PASSING UP TO EAST GREENWICH.

Vessels from the Southward, on either the **N**. by **E**. $\frac{3}{8}$ **E.** course or the **N**. course for Warwick Light-house, must, when within four hundred and twenty-five yards of it, in five fathoms water, steer **NW**. $\frac{3}{4}$ **W.**, carrying not less than three fathoms. On this course, when up with the black spar-buoy on Sandy Point Shoal pass to the northward of it and steer **NW**. by **W**. $\frac{3}{4}$ **W.**, carrying not less than thirteen feet until up with the black spar-buoy on Sally's Rock. Round this buoy to the northward at a distance of about one hundred yards and steer **W**. by **S**. $\frac{3}{4}$ **S.**, heading directly for the red spar-buoy on Chippanogset Island Shoal and carrying not less than ten feet water. Pass to the southward of this buoy, close-to, and steer so as to pass about fifty yards to the northward and westward of the black spar-buoy on Long Point Shoal, carrying not less than thirteen feet. When past this buoy steer for the red spar-buoy on Garden Flats, passing to the eastward of it, close-to. Continue the course until abreast of the wharf-line of East Greenwich, when anchor in from seven to eleven feet, sticky bottom. No stranger should attempt to enter this harbor without a pilot.

The above courses pass three hundred and sixty yards to the southward of Warwick Light-house; about seventy-five yards to the northward of the buoy on Sandy Point Shoal; one hundred and forty yards to the northward, and about the same distance to the westward, of the black spar-buoy on Sally's Rock; thirty yards to the eastward and southward of the red spar-buoy on Chippanogset Island Shoal; and fifty yards to the northward and westward of the black spar-buoy on Long Point Shoal.

Vessels from the Eastern Passage, intending to enter Greenwich Bay, must steer for the horizontally striped buoy on Fort Rock, passing to the northward of it, close-to. When Conimicut Point Light-house bears **N**. by **E**. $\frac{1}{4}$ **E.**, a little over two miles and three-eighths distant, steer **W**. by **S**. $\frac{1}{8}$ **S.**, carrying not less than six fathoms. On this course, when Warwick Light-house bears **N.**, a quarter of a mile distant, steer **NW**. $\frac{3}{4}$ **W.**, which course will lead, with not less than three fathoms, up to the black spar-buoy on Sandy Point Shoal. Pass to the northward of this buoy, close-to, and follow the directions given above.

LIGHT-HOUSE.

NAME.	Latitude.	Longitude West.						Fixed or Revolving.	Height above sea-level.	Distance visible in nautical miles.
		In arc.			In time.					
		°	'	"	h.	m.	s.			
Warwick Light-house	41 39 59	71	22	42	4	45	31	Fixed.	Feet. 54	13

TIDES.

Corrected Establishment	7 ^h 59 ^m
Mean Rise and Fall of tides	4.5 ft.
Mean Rise and Fall of Spring tides	5.0 ft.
Mean Rise and Fall of Neap tides	3.9 ft.
Mean duration of Rise	7 ^h 10 ^m
Mean duration of Fall	5 ^h 15 ^m

VARIATION OF THE COMPASS.

The magnetic variation in Greenwich Bay for 1880 is 10° 20' W., with an annual increase of 2½'.

WARREN RIVER.

This river, the entrance to which is about two miles and a quarter below the mouth of Providence River, is contained between Bristol Neck and Popasquash Neck on the east and south, and Rumstick Neck on the west. It is about one mile and three-eighths wide at its mouth; but this width is much diminished by the extensive Rumstick Shoal making off to the southward from Rumstick Neck. The river has a general course about NNE. for two miles and three-eighths to the town of Warren, which is situated upon its eastern bank; but the channel is narrow and much obstructed by shoals. It is well buoyed, however, and eleven feet at mean low water can be taken up to the wharf-line of the town. No stranger should attempt the passage of this river without a pilot.

North Point, the northern end of Popasquash Neck and the southern point of entrance to Warren River, is about ten feet high, level and grassy. The neck to the southward of it shows very gently sloping lands, composed of cleared and cultivated fields, and is in no place more than forty feet high. From off this neck the town of Warren is plainly visible and is easily recognized by a large, square, brown cupola, near which will be seen a tall white spire.

Rumstick Point, the southern extremity of Rumstick Neck and the northern point of entrance to the river, is a low marshy point, backed by nearly level grassy lands, bare of trees and under fine cultivation. A long shoal makes off to the southward from this point for five-eighths of a mile, with not more than nine feet upon it at mean low water. Between the southern extremity of this shoal and North Point the entrance to the river is a little over three-quarters of a mile wide, and has a depth of from sixteen feet to three and a half fathoms.

From North Point the eastern shore of the river curves gently to the eastward for about three-eighths of a mile, and then takes a N. by E. ½ E. direction for one mile and five-eighths to Jacob's Point. The land is low, partly marshy, backed by gently sloping, cleared and cultivated fields, and dotted with orchards. From Rumstick Point the western shore of the river runs about NNE. for half a mile to the mouth of Smith's Cove. This cove is about a quarter of a mile wide at its entrance, and runs in a nearly due N. direction for five-eighths of a mile along the eastern face of Rumstick Neck. It has from three to ten feet in it at mean low water, but is of no importance.

Adam's Point, the eastern point of entrance to Smith's Cove, is low and marshy, backed by higher lands and cleared fields, and lies directly opposite Jacob's Point. Between the two the river is about four hundred and fifty yards wide; but the available channel has a width of only one hundred yards, with a depth, however, of from four to five fathoms. Beyond this it widens and retains an average width of six hundred yards until nearly up to the wharf-line of Warren, when it again contracts—being here about two hundred yards wide. The channel is narrow and winding, and is in no place more than one hundred and twenty-five yards wide between the lines of two fathoms. Both shores of the river partake of the same general character as those to the southward,—being low, partly marshy, and backed by gently sloping, cleared and cultivated lands, dotted with orchards. Off the northern end of the town, lying directly in the middle of the river, and distant from shore about one hundred yards, is a small, low, marshy island, known as Little Island. To the westward of this lies the entrance to Barrington River,—a narrow stream, with an average width of an eighth of a mile, running in a nearly N. by W. direction for three-eighths of a mile, where it is crossed by a railroad bridge. From twelve to fifteen feet may be taken into this river at mean low water.

The wharf-line of the town of Warren extends along the eastern bank of the river for five-eighths of a mile; and about an eighth of a mile above its northern end the river is crossed by a bridge, and is only about one hundred and fifty yards wide, with from three to eight feet water.

DANGERS

IN APPROACHING AND ENTERING WARREN RIVER.

Vessels on the $N. \frac{1}{2} E.$ course through the Eastern Passage must, when North Point of Prudence Island bears $W. \frac{1}{8} N.$ and Conimicut Point Light-house $N.$ by $W. \frac{3}{8} W.$, steer $NE.$ by $N. \frac{1}{4} N.$ for the entrance to the river. On this course there are no dangers; but vessels, if beating, must beware of Ohio Ledge, a small detached rocky shoal about three hundred yards long and two hundred yards wide, with a depth of from eight to eleven feet upon it at mean low water. A can-buoy* of the second class, painted red and black in horizontal stripes, is placed on the southern extremity of the shoal in twelve feet water. It bears from North Point of Popasquash Neck $W. \frac{1}{2} N.$, a little over seven-eighths of a mile, and from Rumstick Point $SW. \frac{1}{8} S.$, one mile and three-quarters distant. The sailing-line passes well to the eastward of this buoy, close under the western face of Popasquash Neck. *Ohio Ledge.*

When past the northern end of Popasquash Neck, the horizontally striped buoy on Rumstick Shoal will be seen nearly in range with Rumstick Point. This shoal makes off to the southward from Rumstick Neck for five-eighths of a mile with an average width of seven hundred and fifty yards, and has depths upon it varying from two to twelve feet. The buoy is a spar, painted red and black in horizontal stripes; is placed in twelve feet on the southeastern extremity of the shoal, and is intended as a guide for vessels using the Eastern Passage as well as for those entering Warren River. It bears from Ohio Ledge buoy $NE. \frac{7}{8} E.$, nearly one mile and three-eighths, and from the southern end of Rumstick Neck $S.$ by $W. \frac{1}{8} W.$, a little over half a mile distant. The sailing-line passes to the eastward of this buoy and leads nearly for the black spar-buoy on the eastern side of Rumstick Shoal. This buoy is placed just to the eastward of a nine feet spot, in thirteen feet water, is marked No. 1, and bears from the buoy on the southeastern end of the shoal $NE. \frac{7}{8} N.$, half a mile distant. The sailing-line passes to the eastward of it, close-to.

About three hundred yards $NE.$ of the black spar-buoy on the eastern end of Rumstick Shoal will be seen a red spar-buoy; and to the northward of this, and nearly in range with it, will be seen another of the same color. These buoys mark the western limits of The Lower Middle Ground, making off from the eastern side of the river for about six hundred yards, with a depth of from five to seven feet upon it at mean low water. The southernmost buoy is marked No. 2, and is placed in twelve feet on the southwestern end of the shoal. The northernmost buoy is placed on the northwestern end of the shoal in eleven feet water, is numbered 4, and marks the turning point in the channel. *The Lower Middle Ground.*

The sailing-line passes to the westward of the buoys on The Lower Middle Ground, and when up with the northern one turns abruptly to the northeastward. On this course there will be seen, on the eastern side of the river, off Jacob's Point, a red spar-buoy; and to the westward of this a small low tower, surmounted by an iron spindle. The buoy is on Jacob's Point Shoal, making off from Jacob's Point for one hundred and fifty yards with from three to twelve feet upon it. The buoy is placed off its western side in fifteen feet water, is marked No. 6, and the sailing-line passes to the westward of it. The beacon is on Allen's Rock, lying about an eighth of a mile $S. \frac{1}{4} W.$ from Adam's Point, and marks the western limits of the channel. *Jacob's Point Shoal.*

The sailing-line passes midway between the beacon on Allen's Rock and the buoy on Jacob's Point Shoal, and continues to the northeastward until up with the black spar-buoy on The Upper Middle Ground. This buoy is marked No. 3, and is placed in twelve feet on the southeastern extremity of the shoal. The channel passes to the eastward of it, close-to, and then turns, running in a nearly due $N.$ direction, and passing to the westward of the red spar-buoy (No. 8) on Lower Meadows Shoal at a distance of about one hundred and twenty-five yards. When past this buoy, the course leads almost directly for the red spar-buoy (No. 10) on Upper Meadows Shoal, passing to the westward of it, close-to. *The Upper Middle Ground.*

When past the red buoy (No. 10) on Upper Meadows Shoal the sailing-line leads directly for the wharf-line of the town, passing to the westward of the red spar-buoy (No. 12) on Abbott's Rock, and carrying not less than eleven feet. Here anchorage will be found close under the wharves in from eleven to seventeen feet, hard bottom. Just to the southward of Little Island, off the northern end of the town, will be seen the black spar-buoy (No. 5) on Little Island Shoal. Vessels wishing to make an anchorage off the upper part of Warren pass to the eastward of this buoy; but those intending to enter Barrington River leave it to the northward, close-to. With a fair wind vessels may enter the river and proceed up to Warren in safety by following the directions given below; but it is not advisable to attempt it without a pilot.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING WARREN RIVER.

On the $N. \frac{1}{2} E.$ course through the Eastern Passage, when Conimicut Point Light-house bears $N.$ by $W. \frac{3}{8} W.$ and North Point of Prudence Island $W. \frac{1}{8} N.$, the depth will be seven and a half fathoms,

Sailing Directions--Warren River. and the course **NE.** by **N. $\frac{1}{4}$ N.** for the entrance to the river, carrying not less than sixteen feet water. On this course, when past the horizontally striped buoy on Rumstick Shoal, with Conimicut Point Light-house bearing **NW. $\frac{3}{4}$ W.**, in seventeen feet, steer **N. $\frac{1}{4}$ E.**, passing to the eastward of the black spar-buoy on the eastern side of Rumstick Shoal and to the westward of the red spar-buoys on The Lower Middle Ground. This course carries not less than fifteen feet, and when abreast of the northernmost buoy on The Lower Middle Ground, **NE.** by **E.** will lead nearly for the black spar-buoy on The Upper Middle Ground, passing midway between the red buoy on Jacob's Point Shoal and the beacon on Allen's Rock and carrying not less than sixteen feet. When up with the black buoy on The Upper Middle Ground pass to the eastward of it, close-to, and steer **N.**, carrying not less than thirteen feet, until up with the red spar-buoy on Upper Meadows Shoal. Round this buoy to the westward at a distance of one hundred yards, and steer so as to pass about fifty yards to the westward of the red spar-buoy on Abbott's Rock. When past it, anchor in from nine to seventeen feet, hard bottom, close under the wharf-line of the town of Warren.

The above courses pass a little over three-quarters of a mile to the eastward of the horizontally striped buoy on Ohio Ledge; two hundred and twenty-five yards to the westward of the northern end of Popasquash Neck; four hundred yards to the eastward of the horizontally striped buoy on the southeastern end of Rumstick Shoal; fifty yards to the eastward of the black spar-buoy on the eastern end of the same shoal; one hundred and twenty-five yards to the westward of the red spar-buoy on the southwestern end of The Lower Middle Ground, and one hundred and fifty yards to the westward of the red spar-buoy on its northwestern end; midway between the red spar-buoy on Jacob's Point Shoal and the beacon on Allen's Rock; fifty yards to the eastward of the black spar-buoy on the southeastern end of The Upper Middle Ground; one hundred and twenty-five yards to the westward of the red spar-buoy on Lower Meadows Shoal; one hundred yards to the westward of the red spar-buoy on Upper Meadows Shoal; and about fifty yards to the westward of the red spar-buoy on Abbott's Rock.

TIDES.

Corrected Establishment	8 ^h 7 ^m
Mean Rise and Fall of tides	4.6 ft.
Mean Rise and Fall of Spring tides	5.0 ft.
Mean Rise and Fall of Neap tides	4.2 ft.
Mean duration of Rise	7 ^h 11 ^m
Mean duration of Fall	5 ^h 14 ^m

VARIATION OF THE COMPASS.

The magnetic variation in Warren River for 1880 is $10^{\circ} 30'$ W., with an annual increase of $2\frac{1}{2}'$.

BRISTOL HARBOR

is an irregularly shaped cove contained between Bristol Neck on the east and Popasquash Neck on the west, and has two entrances, separated by Hog Island. The **Eastern Channel**, which leads between the southern end of Bristol Neck on the east and Hog Island on the west, is nearly half a mile wide at its entrance and has a depth of from eleven feet to four and a quarter fathoms. The **Western Channel**, which leads between the southern end of Popasquash Neck on the west and Hog Island, has a width of about half a mile and a depth of from three to four and three-quarter fathoms, and is the one most commonly used by coasters. The two channels unite about three-quarters of a mile to the northward of Hog Island, and here the harbor is about seven-eighths of a mile wide, but gradually diminishes until at its head it has a width of only seven hundred yards. The town of Bristol is situated on the eastern side of the harbor, a little over half way up the cove. Nine feet at mean low water may be safely taken up to the head of the harbor, and twenty-one feet to the anchorage off the lower end of the town. The harbor has few obstructions and excellent anchorage is found anywhere off the town in from fifteen to seventeen feet, sticky bottom.

Hog Island lies nearly due **N.** and **S.**, in the middle of the entrance to the harbor; is irregular in shape and about five-eighths of a mile long. Viewed from the southward it appears as a low, very gently sloping island, and entirely under cultivation,—the only trees upon it being fruit trees. A group of houses occupies the summit, which is only about forty feet high. Extensive shoals make off to the northward and southward from the island for distances varying from six hundred and fifty yards to three-quarters of a mile. Its eastern and western sides, however, are tolerably bold-to, and may be safely approached within three hundred and seventy-five yards with not less than three fathoms.

Popasquash Point, the southern extremity of **Popasquash Neck** and the western point of entrance to Bristol Harbor, is a low, gently sloping point, bare of trees except at its summit, upon which stands a grove of fruit trees. The neck to the northward of the point shows very gently sloping lands, composed of cleared and cultivated fields, and is in no place more than forty feet high.

Bristol Ferry Point, the southern extremity of **Bristol Neck** and the eastern point of entrance to the harbor, is a high rocky head, sparsely covered with grass, and dotted here and there with low fir and spruce trees except at its southern extremity, where a group of larger trees will be seen. The land back of the point rises to a height of one hundred feet, is cleared and cultivated, with a few trees appearing here and there upon the summit.

Bristol Ferry Point also forms the site of **Bristol Ferry Light-house**, a square brick tower, painted white, and attached to the keeper's dwelling, which is also white. It shows a fixed white light, of the sixth order, from a height of thirty-five feet above the sea, visible eleven miles, and is the guide to Mount Hope Bay as well as to Bristol Harbor. Its geographical position is

Latitude 41° 38' 33" N.
Longitude 71° 15' 38" W.,

and it bears from

	Miles.
The southeastern extremity of Hog Island, NE. by E. $\frac{1}{2}$ E.	$\frac{1}{2}$
Muscle Bed Shoals Light-house, N. $\frac{1}{2}$ E.	a little over $\frac{1}{2}$
The black spar-buoy on the southeastern end of Hog Island Shoal, NE.	about $\frac{1}{2}$
Prudence Island Light-house, NE. $\frac{1}{2}$ E.	nearly 3

Nearly due S. from Bristol Ferry Light-house, distant from it a little over three-eighths of a mile, will be seen **Muscle Bed Shoals Light-house**, a small wooden tower, painted red, attached to the centre of the keeper's dwelling, which is also red. The light is fixed red, of the sixth order, shown from a height of thirty-five feet above the sea, visible eleven miles. Between it and Bristol Ferry Light-house leads the passage into Mount Hope Bay. Vessels bound into Bristol Harbor pass about three-eighths of a mile to the westward of Muscle Bed Shoals Light-house.

From Bristol Ferry Point the western shore of Bristol Neck has a general direction about NW. by W. for nearly three-eighths of a mile, and then turns to the northward, running about N. $\frac{1}{2}$ E. for seven-eighths of a mile to the southern end of the town of Bristol. The land is high, gently sloping, cleared and cultivated, dotted with houses and occasional groves of trees. About three hundred and fifty yards to the southward of the lower end of the town and distant from shore about two hundred yards lies a small, low, marshy island, called **Walker's Island**. Between it and the shore makes in **Walker's Cove**, small, shallow, and of no importance.

The eastern shore of Popasquash Neck has a nearly N. by E. direction for a little over three quarters of a mile, and then turns gradually to the eastward and southward for an eighth of a mile. Thus is formed a small shallow cove, called **Usher's Cove**, indenting the shore of the neck for about four hundred yards. From the eastern point of entrance to this cove the shore curves away gently to the northward, running about N. $\frac{1}{2}$ E. to the head of the harbor. The land is all gently sloping, composed of cleared and cultivated fields and dotted with houses and orchards.

The town of **Bristol** extends along the eastern shore of the harbor for about one mile and has important manufacturing interests.

DANGERS

IN APPROACHING AND ENTERING BRISTOL HARBOR.

I. *By the Eastern Channel.*—Vessels when abreast of Prudence Island Light-house, distant from it about a quarter of a mile, must steer NE. $\frac{1}{2}$ E. On this course there will be seen close in with the eastern side of the passage, off Coal Mine Point, a red spar-buoy. This is on Coal Mine Rock, with eight feet at mean low water and from twelve feet to four fathoms on all sides of it. The buoy is marked No. 18, placed on the western side of the rock in fifteen feet, hard bottom, and bears from Prudence Island Light-house NE. by E. $\frac{1}{2}$ E., nearly one and a quarter miles, and from Bristol Ferry Light-house SW. $\frac{1}{4}$ S., one mile and three-quarters distant. The sailing-line passes a little over four hundred yards to the northward of the buoy and carries not less than five and a quarter fathoms.

Coal Mine
Rock.

From Coal Mine Rock buoy the eastern shore of the passage as far up as Muscle Bed Shoals Light-house may be safely approached within two hundred yards with not less than three fathoms,—except off the northern end of Coal Mine Point, where a depth of fifteen feet is found at a distance of four hundred yards from shore. The sailing-line passes about seventy-five yards to the northward of the northern extremity of this fifteen feet shoal.

When past the buoy on Coal Mine Rock the black spar-buoy on the southeastern end of Hog Island Shoal will be seen, bearing about NE. $\frac{1}{4}$ N., and distant seven-eighths of a mile. This shoal makes off from the southeastern extremity of Hog Island for a distance of nearly six hundred yards and has from five to twelve feet upon it at mean low water. The buoy is placed in fifteen feet, is marked No. 1, and bears from the red spar-buoy on Coal Mine Rock NE. by N. $\frac{1}{2}$ N., nearly a mile; from Muscle Bed Shoals Light-house W. by S. $\frac{1}{2}$ S., a little over half a mile; and from Bristol Ferry Light-house SW., nearly seven-eighths of a mile distant.

Hog Island
Shoal.

The southern side of Hog Island, to the westward of the above-mentioned buoy should not be approached nearer than five hundred yards, as the shoal ground, known under the general name of

Hog Island Shoal, makes off for that distance to the southward with from six to eighteen feet. This shoal extends along the entire southern side of the island, and upon its southwestern end will be seen a red spar-buoy,—one of the guides for the Western Channel into Bristol Harbor.

When past the black spar-buoy on the southeastern end of Hog Island Shoal, with Bristol Ferry Light-house bearing **NE. $\frac{1}{8}$ N.**, the course turns abruptly to the northward. On this course there will be seen, a little to the westward of the light-house, close in with the southern shore of **Pearce's Rock**. Bristol Neck, a red spar-buoy. This is on Pearce's Rock, a sunken rock, nearly bare at mean low water, and distant from shore about one hundred yards. The buoy is marked No. 2, placed in ten feet on the western side of the rock, and bears from Bristol Ferry Light-house **W.**, four hundred yards; from Muscle Bed Shoals Light-house **N. by W. $\frac{1}{8}$ W.**, nine hundred yards; and from the black spar-buoy on the southeastern extremity of Hog Island Shoal **NE. by N.**, a little over five-eighths of a mile distant. From the buoy to the northward as far up as Walker's Cove the western shore of Bristol Neck may be safely approached within two hundred yards with not less than three fathoms.

On the western side of the channel, a little over half a mile above the southeastern end of Hog Island, will be seen the black spar-buoy on Hog Island Rock, with three feet at mean low water upon it, and distant from shore about an eighth of a mile. The buoy is marked No. 3, placed just to the eastward of the rock in twelve feet water, and bears from the red spar-buoy on Pearce's Rock **NW. $\frac{3}{4}$ W.**, nine hundred yards, and from Muscle Bed Shoals Light-house **NW. $\frac{3}{8}$ N.**, nearly seven-eighths of a mile distant. The sailing-line passes to the eastward of this buoy and leads nearly for the wharf-line of the town. In beating, vessels must not approach the eastern side of Hog Island nearer than four hundred yards, as shoal water (from eleven to eighteen feet) makes off for that distance from it.

When past the black spar-buoy on Hog Island Rock there will be seen, a little to the westward of the course, bearing about **N NW.**, a spar-buoy painted red and black in horizontal stripes. This is on The Middle Ground, making off from the northern end of Hog Island for nearly three-quarters of a mile with from three to twelve feet upon it and in some places nearly bare at mean low water. The buoy is placed just to the northward of a five feet spot and marks the junction of the Eastern and Western channels into the harbor. It bears from the black spar-buoy on Hog Island Rock **N. by W. $\frac{1}{4}$ W.**, nearly one mile, and from the northern end of Hog Island **N.**, nearly three-quarters of a mile distant. To avoid the flats lying between this buoy and the island vessels must not go to the westward of the black spar-buoy on Hog Island Rock bearing **S. $\frac{1}{8}$ E.**

When past the buoy on The Middle Ground anchorage will be found anywhere off the town in from eleven feet to three and a quarter fathoms, sticky bottom; or, vessels may haul up for the head of the harbor and anchor, according to draught, in from nine to twelve feet.

Bristol Harbor is an excellent harbor of refuge, and comparatively easy of access,—especially by the Western Channel. It is much resorted to.

* SAILING DIRECTIONS

FOR APPROACHING AND ENTERING BRISTOL HARBOR.

I. By the Eastern Channel.—On the **NE. by N. $\frac{1}{8}$ N.** course through the Eastern Passage, when Prudence Island Light-house bears **NW. by W. $\frac{1}{2}$ W.**, distant nearly a quarter of a mile, with a depth of fourteen and a half fathoms, steer **NE. $\frac{1}{2}$ E.**, heading nearly for Muscle Bed Shoals Light-house and carrying not less than five and a quarter fathoms. On this course, when Bristol Ferry Light-house bears **NE. $\frac{1}{8}$ N.**, distant nearly three-quarters of a mile, and Muscle Bed Shoals Light-house **NE. by E. $\frac{3}{4}$ E.**, distant a little over three-eighths of a mile, steer **N. $\frac{1}{4}$ W.**, passing to the eastward of the black spar-buoy on Hog Island Rock, and carrying not less than three and a quarter fathoms. Continue this course until abreast of the buoy on The Middle Ground, when haul a little to the westward and anchor off the town in from twelve feet to three and a quarter fathoms, sticky bottom; or, continue the course for the head of the harbor, anchoring at discretion in from nine to fourteen feet water.

The above courses pass four hundred and twenty-five yards to the northwestward of the red spar-buoy on Coal Mine Rock; two hundred and fifty yards to the southward, and three hundred and fifty yards to the eastward of the black spar-buoy on the southeastern end of Hog Island Shoal; five hundred yards to the westward of the red spar-buoy on Pearce's Rock; two hundred yards to the eastward of the black spar-buoy on Hog Island Rock; and a quarter of a mile to the eastward of the horizontally striped buoy on The Middle Ground.

DANGERS

IN APPROACHING AND ENTERING BRISTOL HARBOR.

II. *By the Western Channel.*—When abreast of Prudence Island Light-house, distant from it about a quarter of a mile, steer **N. by E. $\frac{1}{2}$ E.** On this course, when about one mile to the northward of the light-house there will be seen, on the eastern side of the channel, a red spar-buoy. This is on Hog Island Shoal, making off from the southern and western sides of Hog Island in a southwesterly direction for about nine hundred yards, with from three to eighteen feet upon it at mean low water. The buoy is placed on the extreme southwestern end of the shoal in seventeen feet, hard bottom, is marked No. 20, and bears from Prudence Island Light-house **NE. by N. $\frac{3}{4}$ N.**, a little over one mile and five-eighths, and from the southwestern end of Hog Island **SW. $\frac{1}{2}$ W.**, nearly nine hundred yards distant. Vessels drawing ten feet water and less may pass three hundred and fifty yards inside the buoy with safety.

*Hog Island
Shoal.*

If beating to windward vessels may approach the eastern shore of Prudence Island within two hundred yards with not less than three fathoms; but about one mile and a quarter above Prudence Island Light-house the shore should not be approached nearer than a quarter of a mile, at which distance a depth of sixteen feet will be found.

When past the red spar-buoy on Hog Island Shoal the channel is perfectly clear and there are no dangers,—it being only necessary not to approach the western side of Hog Island nearer than three hundred and fifty yards. On the western side of the channel Popasquash Point must be given a berth of at least two hundred and fifty yards in order to avoid Popasquash Point Shoal, which makes off to the southward from it for that distance. It is marked by a black spar-buoy (No. 1) placed in twelve feet water off its southeastern extremity. This buoy bears from the red spar-buoy on the southwestern end of Hog Island Shoal **N. $\frac{1}{2}$ W.**, nearly a mile, and from the northern end of Hog Island **W. $\frac{1}{4}$ N.**, about three-quarters of a mile distant.

*Popasquash
Point Shoal.*

With Popasquash Point bearing **W. by N. $\frac{1}{4}$ N.**, a quarter of a mile distant, the course changes more to the eastward, leading directly for the wharf-line of Bristol. On this course there will be seen, on the eastern side of the channel, a stone tower surmounted by a spindle and red ball. This is Castle Island Beacon, on Castle Island Shoal, nearly bare at mean low water, and forming part of the extensive shoal making off to the northward from Hog Island. This beacon should not be approached nearer than two hundred yards, as it is surrounded upon all sides by shoal water.

*Castle Island
Shoal.*

When up with the beacon on Castle Island Shoal there will be seen, on the western side of the channel, a black spar-buoy. This is on Usher's Rocks, a rocky shoal about two hundred yards long, lying at a distance of about one hundred and fifty yards from shore, and nearly bare at mean low water. The buoy is marked No. 3, placed in thirteen feet about one hundred and twenty-five yards to the eastward of the shoal, and bears from Popasquash Point **NE. $\frac{1}{4}$ E.**, three-quarters of a mile, and from Castle Island Beacon **N. by W. $\frac{3}{4}$ W.**, nearly three-eighths of a mile distant.

Usher's Rocks.

The sailing-line passes about midway between the buoy on Usher's Rocks and the horizontally striped buoy on The Middle Ground. This shoal makes off from the northern end of Hog Island for nearly three-quarters of a mile with from three to twelve feet upon it and in some places nearly bare at mean low water. The buoy is placed in eleven feet just to the northward of a five feet spot and marks the junction of the Eastern and Western channels into the harbor. It bears from the black spar-buoy on Usher's Rocks **E. $\frac{1}{8}$ N.**, six hundred and fifty yards, (which is here the width of the channel,) and from Castle Island Beacon **NE. by N.**, eight hundred and fifty yards distant. When past this buoy anchor anywhere off the town in from twelve feet to three and a quarter fathoms, sticky bottom.

*The Middle
Ground.*

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING BRISTOL HARBOR.

II. *By the Western Channel.*—On the **NE. by N. $\frac{1}{8}$ N.** course through the Eastern Passage, when Prudence Island Light-house bears **NW. by W. $\frac{1}{2}$ W.**, distant about a quarter of a mile, with a depth of fourteen and a half fathoms, steer **N. by E. $\frac{1}{2}$ E.**, carrying not less than three and a half fathoms. Continue this course until Popasquash Point bears **W. by N. $\frac{1}{4}$ N.**, a little over a quarter of a mile distant and the northern end of Hog Island **E. by S. $\frac{3}{4}$ S.**, about half a mile distant, in three and three-quarter fathoms water. From this position steer **NE. $\frac{1}{2}$ N.**, heading directly for the wharf-line of Bristol and carrying not less than three and a quarter fathoms. When past the buoy on The Middle Ground anchor anywhere in from twelve feet to three and a quarter fathoms, sticky bottom; or, haul up for the head of the harbor and anchor according to draught in from nine to fourteen feet.

The above courses pass three hundred and seventy yards to the westward of the red spar-buoy on Hog Island Shoal; a quarter of a mile to the westward of the extreme western end of Hog Island; five hundred and fifty yards to the eastward of Popasquash Point; a little over a quarter of a mile to the westward of Castle Island Beacon; the same distance to the eastward of the black spar-buoy on Usher's Rocks; and two hundred yards to the westward of the horizontally striped buoy on The Middle Ground.

LIGHT-HOUSE.

NAME.	Latitude.	Longitude West.			Fixed or Revolving.	Height above sea-level.	Distance visible in nautical miles.
		In arc.		In time.			
	° ' "	° ' "	h. m. s.		Feet.		
Bristol Ferry Light-house	41 38 33	71 15 38	4 45 3	Fixed.	35	11	

TIDES.

Corrected Establishment	8 ^h 10 ^m
Mean Rise and Fall of tides	4.7 ft.
Mean Rise and Fall of Spring tides	5.1 ft.
Mean Rise and Fall of Neap tides	4.0 ft.
Mean duration of Rise	7 ^h 15 ^m
Mean duration of Fall	5 ^h 10 ^m

VARIATION OF THE COMPASS.

The magnetic variation in Bristol Harbor for 1880 is 10° 15' W., with an annual increase of 2½'.

MOUNT HOPE BAY

is a wide bay lying nearly NE. and SW., about six miles long and two miles and three-quarters wide in its widest part. It is contained between the mainland of Rhode Island on the east, Bristol and Warren necks on the west, and Gardiner's and Sewammock necks on the north. Into its northern part empty the Kickamuit, Cole's, Lee's, Taunton and Fall rivers,—the latter, which empties into the northeastern part of the bay, being the only one of any importance. The entrance to the bay lies between Bristol Ferry Point on the north and the northwestern end of Rhode Island on the south and is about half a mile wide, with a depth of from six to thirteen fathoms in it. From the entrance to Fall River the distance is five miles and three-eighths, and a depth of not less than sixteen feet at mean low water can be taken through the bay up to the city.

Bristol Ferry Point is a high, rocky head, sparsely covered with grass and dotted here and there with low fir and spruce trees,—except at its southern extremity, where there is a group of larger trees. On this southern extremity stands the light-house known as Bristol Ferry Light-house, a square brick tower, painted white and attached to the keeper's dwelling, which is also white. It shows a fixed white light, of the sixth order, from a height of thirty-five feet above the sea, visible eleven miles, and is a guide to Bristol Harbor as well as to Mount Hope Bay. Its geographical position is

Latitude	41° 38' 33" N.
Longitude	71° 15' 38" W.,

and it bears from Prudence Island Light-house NE. ½ E., nearly three miles distant.

Nearly due S. from Bristol Ferry Light-house, distant a little over three-eighths of a mile, will be seen **Muscle Bed Shoals Light-house**, a small wooden tower, painted red, and attached to the keeper's dwelling, which is of the same color. The light is a fixed red, of the sixth order, shown from a height of thirty-five feet above the sea, and is visible eleven miles. Its geographical position is

Latitude	41° 38' 8" N.
Longitude	71° 15' 37" W.,

and it bears from Bristol Ferry Light-house S. ½ W., a little over three-eighths of a mile, and from Prudence Island Light-house NE. by E. ½ E., two miles and five-eighths distant.

A fog-bell, struck by machinery once every twenty seconds, is attached to the light-house.

From Bristol Ferry Point the eastern shore of Bristol Neck spreads away into a large cove, called **Church's Cove**,—the eastern point of which is known as Mount Hope Point. Back of this rises a high, smooth, gently sloping hill, two hundred feet high, called **Mount Hope**, from which the bay takes its name. Its southern slopes are tolerably well wooded, but its summit and most of the eastern slopes are cleared and under cultivation. The shores of Church's Cove between Bristol Ferry Point and Mount Hope Point are mostly of moderate height, somewhat undulating and under cultivation, but with occasional thick groves of trees.

The northern shore of Rhode Island from Muscle Bed Shoals Light-house to Common Fence Point, the northern extremity of the island, is quite low and flat and under cultivation, with low sandy faces showing here and there. The high lands on the mainland are seen over it, diversified with wooded and cleared fields. Just above the light-house is a large wharf, and near it will be seen a factory for the manufacture of fish-oil.

Common Fence Point, the northern end of Rhode Island, is about two miles above the entrance to the bay and is a long, low flat, sandy point with a few old houses and sheds standing upon its extremity. A little to the northward will appear a group of grassy hills, rising abruptly from the flat lands on the eastern shore of the bay. They are rocky and destitute of trees except the southernmost, which has a few trees clinging to its sides. On the eastern side of Common Fence Point opens the northern entrance to Sakonnet River, leading between the eastern shores of Rhode Island and the mainland. (See pages 243-249.)

Common Fence Point.

Above Mount Hope Point the western shore of Mount Hope Bay stretches to the northward for about two miles to the entrance to Kickamuit River. The shores are of moderate height, gently sloping, diversified with orchards, cleared and cultivated fields and woodlands. The entrance to Kickamuit River is called **The Narrows** and is only about one hundred yards wide between two very low, flat, sandy points. Above **The Narrows** the river rapidly widens, and at its widest part, about one mile above the entrance, it has a width of about five-eighths of a mile. It runs in a nearly **NNW** direction for about two miles to its head, where it is only two hundred and fifty yards wide, and is crossed by a railroad bridge. Six feet only at mean low water can be carried across the bar at the mouth of the river.

Kickamuit River.

Kickamuit River is separated by Warren Neck from Cole's River, another shallow stream, which empties into the bay about midway of its northern shore. It is about half a mile wide at its mouth and not less than thirteen feet can be taken into it at mean low water. **Warren Neck** is about sixty feet high, with very gentle slopes, dotted with orchards and cleared fields, and almost entirely under cultivation.

Gardiner's Neck, which separates Cole's River from Lee's River, to the eastward, is about forty feet high, with nearly level summit, cultivated, and dotted with houses. Its southwestern end, which is the eastern point of entrance to Cole's River, shows a yellow sandy face about twenty feet high. Lee's River runs into the bay in a nearly **SW** direction between Sewammock Neck on the east and Gardiner's Neck on the west. It is a little over half a mile wide at its mouth, but rapidly narrows, and about one mile above the entrance is crossed by a railroad bridge. Here it is a little over one hundred yards wide. Seven feet at mean low water can be taken up the river as far as the bridge.

Gardiner's Neck.

Brayton Point, the eastern point of entrance to Lee's River and the northern point of entrance to Fall River, is a round smooth hill about forty feet high, gently sloping and all under cultivation. Its northern slopes are dotted with houses and trees. Back of the point the land on **Sewammock Neck** rises to a height of about one hundred and twenty feet, is gently sloping, cleared and cultivated and dotted with houses and fruit trees.

Brayton Point.

Fall River makes in between Brayton Point on the north and the mainland on the south and runs in a nearly **NE** direction. It is about one mile wide at its mouth, but gradually contracts to **The Ferry**, about two miles above, where it has a width of only three hundred and fifty yards. Not less than four fathoms can be taken up to **The Ferry**, and beyond this it is not safe for strangers to go.

Fall River.

The eastern shore of the bay from the mouth of Sakonnet River to Fall River is composed of high steep lands rising to a height of from one hundred and eighty to two hundred feet, almost all under cultivation, but diversified with wooded lands and cleared fields, orchards and handsome groves of trees. The city of **Fall River** is seen on this eastern shore after passing Bristol Ferry Light-house at the entrance to the bay. It is situated on the eastern bank of Fall River, at its mouth, and is a large town with great manufacturing interests. Good anchorage may be found off the city in from three to five fathoms, sticky bottom.

DANGERS

IN ENTERING MOUNT HOPE BAY AND PASSING UP TO FALL RIVER.

When abreast of Prudence Island Light-house, distant from it about five hundred yards, steer **NE. $\frac{1}{2}$ E.** On this course there will be seen on the eastern side of the passage, off Coal Mine Point, a red spar-buoy. This is on Coal Mine Rock, a sunken rock with eight feet upon it at mean low water, lying on the edge of the eighteen feet curve and distant from shore about two hundred and seventy-five yards. The buoy is marked No. 18, placed in fifteen feet on the western edge of the rock, and bears from Prudence Island Light-house **E. by N. $\frac{1}{8}$ N.**, nearly one mile and three-eighths, and from Bristol Ferry Light-house **SW. $\frac{3}{4}$ S.**, one mile and three-quarters distant. When past this buoy vessels, if beating, must not approach the southern side of Hog Island nearer than six hundred yards, at which distance a depth of eighteen feet will be found.

Coal Mine Rock.

Off the southeastern extremity of Hog Island and distant from it about a quarter of a mile will be seen a black spar-buoy. This is on the southeastern extremity of Hog Island Shoal, making off from Hog Island for nearly six hundred yards with from five to twelve feet upon it at mean low water. The buoy is marked No. 1, placed in fifteen feet, and bears from the red spar-buoy on Coal Mine Rock **NE. by N. $\frac{1}{2}$ N.**, nearly one mile; from Bristol Ferry Light-house **SW.**, a little over three-quarters of a mile; and from Muscle Bed Shoals

Hog Island Shoal.

Light-house **W.** by **S.** $\frac{1}{2}$ **S.**, nearly five-eighths of a mile distant. The sailing-line passes to the southward of this buoy and leads directly for the entrance to the bay, passing about midway between Bristol Ferry Light-house and the light-house on Muscle Bed Shoals.

Vessels beating through this passage must not approach the northwestern end of Rhode Island nearer than two hundred yards. When up with Muscle Bed Shoals Light-house, in order to avoid those shoals, care should be taken not to approach the shore nearer than an eighth of a mile; and when well in the bay the northern shore of Rhode Island as far up as Common Fence Point should be avoided by not standing to the southward of Muscle Bed Shoals Light-house bearing **SW.** by **W.** $\frac{3}{4}$ **W.**

The western shore of the bay from Bristol Ferry Light-house for a short distance to the northward may be safely approached within an eighth of a mile with not less than three fathoms. About a mile above the light-house, however, it becomes much shoaler,—a depth of only fifteen feet being found at a distance of half a mile from the northern shore of Church's Cove.

Directly in the entrance to Church's Cove, distant from shore a little over a quarter of a mile, will be seen a black spar-buoy. This is on Seal Rocks, bare at mean low water, with from twelve to fifteen feet on all sides of them. The buoy is marked No. 3, placed in fifteen feet about one hundred and sixty yards **S SE.** from the rocks, and bears from Bristol Ferry Light-house **NE.** $\frac{1}{2}$ **N.**, one mile and a quarter, and from Mount Hope Point **SW.** by **W.** $\frac{3}{4}$ **W.** To avoid Seal Rocks and the shoal water making off to the eastward from them vessels must not, if beating, stand to the westward of Bristol Ferry Light-house bearing **SW.** $\frac{1}{4}$ **W.**

Off Mount Hope Point, distant from it about three hundred yards, will be seen the black spar-buoy on Mount Hope Point Shoal, making off to the southeastward with from five to twelve feet water, and forming part of the shoal ground extending to the southward from Church's Cove. The buoy is marked No. 5, placed in three fathoms on the southeastern edge of the shoal, and bears from the black spar-buoy on Seal Rocks **E.** by **N.**, half a mile, and from Common Fence Point **NW.** $\frac{1}{2}$ **N.**, seven-eighths of a mile distant.

On the southern side of the bay, off Common Fence Point, will be seen a red spar-buoy. This is on Common Fence Point Shoal, making off to the northward and westward from that point for a little over four hundred yards with a depth of from five to eleven feet upon it at mean low water. The buoy is marked No. 2, placed on the extreme northwestern edge of the shoal in fifteen feet, and bears from the black spar-buoy on Mount Hope Point Shoal **SE.** $\frac{1}{3}$ **E.**, a little over five-eighths of a mile, and from Bristol Ferry Light-house **E.** by **N.** $\frac{3}{4}$ **N.**, a little over one and seven-eighths miles distant.

About three-quarters of a mile to the northward of Common Fence Point the bay is almost entirely occupied by an extensive shoal, across which not more than seventeen feet can be taken by vessels bound to Fall River. On the Rhode Island side of the bay the shoal has a width of about five-eighths of a mile, and beyond this a channel a quarter of a mile wide with from three and a half to seven and a half fathoms, leads close along the eastern shore of the bay up to the mouth of Fall River. Vessels beating up the bay may stand with safety from shore to shore with not less than from thirteen to seventeen feet water,—the former depth, however, being found on the northern side of the bay. All this part of the bay is clear and unobstructed,—it being only necessary, if beating, to avoid Sparrow Island (and the shoal water surrounding it) and Old Bay Rock, both of which obstructions are well up on the northern side of the bay.

Sparrow Island is a small, low, sandy islet lying about **NE.** $\frac{1}{2}$ **N.** from Mount Hope Point, distant a little over a mile and a half. It is surrounded upon all sides by flats known as Sparrow Island Flats, which make off to distances varying from two hundred to four hundred yards, with from three to five feet upon them and in places nearly bare at mean low water. To the northward of Sparrow Island, distant about half a mile, lies Old Bay Rock, with three feet at mean low water, and shoal water to the northward and eastward of it for two hundred and fifty yards. A black spar-buoy, marked No. 7, is placed in ten feet on the eastern side of the rock. Vessels bound into Cole's River may pass this buoy on either side,—being careful, however, to give it a berth of three hundred yards.

When nearly up to the mouth of Fall River there will be seen, nearly in the middle of the entrance, a square granite beacon surmounted by a cage-work day-mark painted black. This is on Borden's Flats, making off to the eastward from Brayton Point for about three-quarters of a mile with from four to ten feet upon them at mean low water. The beacon is built on the eastern edge of the flats; and between it and the wharf-line of the city of Fall River leads the channel, which is here about four hundred and fifty yards wide with a depth of from three to five fathoms. When past this beacon vessels may haul up for the city and anchor in from three to five fathoms, sticky bottom. Strangers must not attempt to pass beyond the city of Fall River without a pilot, and no detailed description of Taunton River and its dangers will, therefore, be given. As before remarked, seventeen feet may be taken through the bay to the anchorage off the city.

SAILING DIRECTIONS

FOR ENTERING MOUNT HOPE BAY AND PASSING UP TO FALL RIVER.

On the NE. by N. $\frac{1}{8}$ N. course through the Eastern Passage, when Prudence Island Light-house bears NW. by W. $\frac{1}{2}$ W., about five hundred yards distant, in fourteen and a half fathoms, steer NE. $\frac{1}{2}$ E., carrying not less than five and a quarter fathoms water. On this course, when about midway between Bristol Ferry Light-house and Muscle Bed Shoals Light-house, with the former bearing N. by E. $\frac{1}{2}$ E. and the latter SE. $\frac{1}{2}$ S., two hundred yards distant, in ten fathoms, steer NE. $\frac{1}{4}$ E., heading directly for the mouth of Fall River and carrying not less than sixteen feet. Continue the course until abreast of the beacon on Borden's Flats, when haul up for the wharf-line of the city and anchor in from three to five fathoms, sticky bottom.

The above courses pass four hundred and twenty-five yards to the northwestward of the red spar-buoy on Coal Mine Rock; an eighth of a mile to the southeastward of the black spar-buoy on Hog Island Shoal; two hundred and seventy-five yards to the westward, and two hundred yards to the northward, of Muscle Bed Shoals Light-house; nearly a quarter of a mile to the southeastward of Bristol Ferry Light-house; a little over half a mile to the southeastward of the black spar-buoy on Seal Rocks; six hundred and seventy-five yards to the southward of the black spar-buoy on Mount Hope Point Shoal; the same distance to the northward of the red spar-buoy on Common Fence Point Shoal; and three hundred yards to the southward of the beacon on Borden's Flats.

LIGHT-HOUSES.

NAME.	Latitude.	Longitude West.			Fixed or Revolving.	Height above sea-level.	Distance visible in nautical miles.
		In arc.		In time.			
	° ' "	° ' "	h. m. s.			Fect.	
Muscle Bed Shoals Light-house	41 38 8	71 15 37	4 45 3			Fixed red.	11
Bristol Ferry Light-house	41 38 33	71 15 38	4 45 3			Fixed.	11

TIDES.

Corrected Establishment at Fall River	8 ^h 15 ^m
Mean Rise and Fall of tides	4.7 ft.
Mean Rise and Fall of Spring tides	5.1 ft.
Mean Rise and Fall of Neap tides	4.1 ft.
Mean duration of Rise	7 ^h 20 ^m
Mean duration of Fall	5 ^h 5 ^m

VARIATION OF THE COMPASS.

The magnetic variation in Mount Hope Bay for 1880 is 10° 30' W., with an annual increase of 2 $\frac{1}{4}$ '.

LIGHT-HOUSES IN NARRAGANSETT BAY.

NAME.	Latitude.	Longitude West.			Fixed or Revolving.	Interval of Flash.	Height above sea-level.	Distance visible in nautical miles.
		In arc.		In time.				
	° ' "	° ' "	h. m. s.			m. s.	Fect.	
Beaver Tail Light-house	41 26 56	71 23 59	4 45 36			Fixed.	68	13
Brenton's Reef Light-vessel	41 25 48	71 22 45	4 45 31			2 Fixed.	50 & 40	12
Lime Rock Light-house	41 28 37	71 19 35	4 45 18			Fixed red.	30	11
Goat Island Light-house	41 29 34	71 19 38	4 45 18			Fixed.	33	11
Rose Island Light-house	41 29 42	71 20 34	4 45 22			Fixed red.	58	11
Dutch Island Light-house	41 29 46	71 24 16	4 45 37			Fixed.	56	13
Poplar Point Light-house	41 34 14	71 26 22	4 45 45			Fixed.	51	13
Muscle Bed Shoals Light-house	41 38 8	71 15 37	4 45 3			Fixed red.	35	11
Prudence Island Light-house	41 36 27	71 18 30	4 45 14			Fixed.	30	11
Bristol Ferry Light-house	41 38 33	71 15 38	4 45 3			Fixed.	35	11
Warwick Light-house	41 39 59	71 22 42	4 45 31			Fixed.	54	13
Conimicut Light-house	41 43 0	71 20 45	4 45 23			Fixed.	50	13
Sullock's Point Light-house	41 44 13	71 21 52	4 45 27			Fixed red.	50	11
Sabine's Point Light-house	41 45 42	71 22 32	4 45 30			Fixed.	51	11
Pomham Rocks Light-house	41 46 37	71 22 11	4 45 28			Fixed red.	69	11
Fuller's Rock Light-house	41 47 36	71 22 48	4 45 31			Fixed.	28	10
Sassafras Point Light-house	41 47 59	71 23 31	4 45 34			Fixed red.	25	10
Point Judith Light-house	41 21 58	71 28 54	4 45 57			Flg W.	0 15	14

ATLANTIC COAST PILOT.

TIDES IN NARRAGANSETT BAY.

	Point Judith.	Beaver Tail Light-house.	Newport Harbor.	Provi- dence.
Corrected Establishment.....	7 ^h 28 ^m	7 ^h 44 ^m	7 ^h 45 ^m	8 ^h 15 ^m
Mean Rise and Fall of tides.....	3.1 ft.	4.0 ft.	3.9 ft.	5.1 ft.
Mean Rise and Fall of Spring tides.....	3.3 ft.	4.2 ft.	4.2 ft.	5.5 ft.
Mean Rise and Fall of Neap tides.....	2.9 ft.	3.8 ft.	3.6 ft.	4.7 ft.
Mean duration of Rise.....	6 ^h 15 ^m	6 ^h 15 ^m	6 ^h 30 ^m	7 ^h 15 ^m
Mean duration of Fall.....	6 ^h 10 ^m	6 ^h 10 ^m	5 ^h 55 ^m	5 ^h 10 ^m

The above table gives the tides only for the most prominent places in the bay. The tides for the various harbors will be found under their respective heads.

VARIATION OF THE COMPASS IN NARRAGANSETT BAY.

The magnetic variation for different points in Narragansett Bay for 1830 is as follows:

Newport Harbor.....	10° 10' W.
Dutch Island Harbor.....	10° 7' W.
Wickford Harbor.....	10° 10' W.
Greenwich Bay.....	10° 20' W.
Warren River.....	10° 30' W.
Bristol Harbor.....	10° 15' W.
Mount Hope Bay.....	10° 30' W.
Head of Providence River.....	10° 28' W.

The approximate annual increase is at present 2 $\frac{1}{2}$ '.

ICE IN NARRAGANSETT BAY.

During winters of ordinary severity navigation is considerably impeded in this bay and its tributaries by floating or drift-ice; and in severe seasons, such as that of 1874-75, by pack or field-ice. Usually the ice begins to form in January or the latter part of December, and there is more or less of it in the channels (especially in Providence River) until the first of March. Sailing vessels bound to Providence are generally obliged to take a steam-tug to enable them to pass through to their destination. During the continuance of strong winds from N. to NE. the ice in the bay and the lower part of Providence River is broken up and driven to sea—generally by way of the Eastern Passage; and if there be much ice, a "gorge" is apt to be formed in the narrow passage between Fort Adams and Fort Dumpling,—completely blocking the passage; but this "gorge" is of short duration. The passages are rarely closed for any length of time below Gould Island in the Eastern, and Dutch Island in the Western Passage; but above these points, in severe winters, the bay is closed to all vessels except powerful propellers. Mount Hope Bay, Bristol, Providence, Greenwich and Wickford harbors are generally closed to sailing vessels during the months of January and February; and the Inner Harbor of Newport is usually shut up during the same months,—only a narrow channel being kept open, by the New York steamers, from the end of Goat Island breakwater to their wharves at the upper end of the harbor.

Winds from N. to W. (unless very strong) are favorable to the formation of ice in the harbors and along the shores; while those from N. to NE. clear the bay and its tributaries. The current of ebb tide also assists the northerly and easterly winds in removing the ice; while that of flood prevents it from going out unless its influence is overcome by the strength of the wind.

BLOCK ISLAND SOUND

is the name given to that large body of water lying to the westward of Point Judith and embraced between the shores of Rhode Island and Connecticut on the north, Block Island and the eastern end of Long Island on the south, and Gardiner's Island on the west. Between these limits it is about twenty-six miles long, with a width of a little over eight and a half miles at its eastern end, (between Block Island and Point Judith,) and a greatest width of about thirteen miles and three-quarters, (between Montauk and Watch Hill points.)

Block Island, which gives the name to the Sound, is about five miles long in a NNE. and SSW. direction, and three miles wide at its southern end, from which point the width gradually diminishes to its northern end, where it terminates in a long flat point known as Sandy Point. A prominent feature of the island is the entire absence of trees,—the surface when viewed from

the eastward having a grassy undulating appearance and the hills in many places showing steep sandy faces.

Block Island. Near the shore-line the land is low, but rapidly rises towards the centre of the island to steep hills, covered only with grass and dotted occasionally with houses. Of these hills the most prominent are **Bush Hill**, (on the eastern shore, about a mile and three-eighths below Sandy Point,) which terminates in a high precipitous head called **Clay Head**, and forming a prominent feature of the landscape when seen from the eastward; **Beacon Hill**, (near the centre of the island and perhaps the most prominent of all;) and **Pilot Hill**, near the southeastern extremity of the island, about half a mile to the northwestward of the Southeast Light-house.

The settlement upon Block Island is known as **New Shoreham**; and the principal part of the village lies on the eastern shore of the island near its southern end, at what was formerly known as **Sands' Landing**—the present site of Block Island Basin.



Page 11

Page 12

Block Island from the Eastward, Southeast, W. of S. Island, & Miles.

Page 13

Page 14

Block Island belongs to the State of Rhode Island. Its northern extremity, called **Sandy Point**, is long, low and flat, partly grassy, but terminating at its northern end in a bare sand beach. About seven hundred yards back from the extremity of the point is built Block Island North Light-house, one of the guides to the eastern entrance of the Sound. The light is fixed white, shown from the top of a granite dwelling two stories high and sixty-one feet above sea-level, and is of the fourth order, visible thirteen and a half miles. Its geographical position is

Latitude 41° 13' 38" N.
 Longitude 71° 34' 34" W.,

and its bearings and distances are as follows: From

	Miles.
Davis' South Shoal Light-vessel, NW. by W. $\frac{1}{2}$ W.	80 $\frac{1}{2}$
Gay Head Light-house, W. $\frac{1}{4}$ S.	33 $\frac{1}{2}$
Cuttyhunk Light-house, W. by S.	30 $\frac{1}{2}$
Vineyard Sound Light-vessel, W. $\frac{1}{4}$ S.	27 $\frac{1}{2}$
Hen and Chickens Light-vessel, W. by S. $\frac{1}{4}$ S.	nearly 28
Brenton's Reef Light-vessel, SW. $\frac{1}{4}$ W.	14 $\frac{1}{2}$
Beaver Tail Light-house, SW. $\frac{1}{4}$ S.	15 $\frac{1}{2}$
Point Judith Light-house, SW. $\frac{1}{4}$ S.	a little over 9 $\frac{1}{2}$

From this light-house

	Miles.
Watch Hill Light-house bears NW. by W. $\frac{1}{4}$ W.	13 $\frac{1}{2}$
Race Rock Light-house W. by N.	20 $\frac{1}{2}$
Gull Island Light-house W. $\frac{1}{4}$ N.	23 $\frac{1}{2}$
Montauk Point Light-house SW. by W. $\frac{1}{4}$ W.	15 $\frac{1}{2}$

There is no fog-signal.

The southeastern extremity of Block Island is called **Crawford's Point**, and is a high grassy head with precipitous sandy faces. On its summit is built Block Island Southeast Light-house, an octagonal brick tower, attached to the keeper's dwelling, fifty-two feet high, and showing a fixed white light, of the first order, from a height of two hundred and four feet above sea-level, visible twenty-one miles. Its geographical position is

Latitude 41° 9' 8" N.
 Longitude 71° 33' 8" W.,

and it bears from

	Miles.
Davis' South Shoal Light-vessel, W. by N. $\frac{1}{4}$ N.	78 $\frac{1}{2}$
Cuttyhunk Light-house, W. by S. $\frac{1}{4}$ S.	31
Gay Head Light-house, W. by S. Southerly	34 $\frac{1}{2}$
Vineyard Sound Light-vessel, W. by S. $\frac{1}{4}$ S.	29
Hen and Chickens Light-vessel, SW. by W. $\frac{1}{4}$ W.	29 $\frac{1}{2}$
Brenton's Reef Light-vessel, SW. $\frac{1}{4}$ S.	17 $\frac{1}{2}$
Beaver Tail Light-house, SW. by S. $\frac{1}{4}$ S.	18 $\frac{1}{2}$
Point Judith Light-house, S SW.	13 $\frac{1}{2}$

From this light-house Montauk Point Light-house bears W. by S., fourteen miles and five-eighths distant.

A steam fog-siren, giving blasts of six seconds at intervals of twenty seconds, is placed in a small building a short distance to the southeastward of the light-house.

On the eastern face of the island a small bay is formed by the curve of the shore, with deep water close in to the land, which is rocky. Near the middle of this bay the shore becomes very low and flat,—the most of the interior at this point being occupied by a large salt-pond, into which there is a very small inlet. This low place is locally known as **The Turn-up**,—the land rising from it each way.

At the southern extremity of this bay, two miles and a half to the southward of Clay Head and a mile and a quarter above Crawford's Point, is what was formerly known as **Sands' Landing**, but is now occupied by Block Island Basin, an artificial harbor constructed by the United States Government for the shelter of small vessels. The basin is formed by a heavy stone breakwater extending in a N. by E. $\frac{1}{4}$ E. direction for about five hundred and twenty-seven yards,—forming a protection from easterly winds,—while a mass of heavy crib-work incloses the basin on the other three sides,—leaving only a narrow entrance on the northern side about eighty feet wide. The basin is nearly square, with a diameter of a little over one hundred and thirty yards and a uniform depth of seven feet at mean low water. Vessels of a moor head and stern and are safe from all winds. The entrance is marked by two red range lights, placed upon the breakwater, to enable vessels to pass through the gates at night. Outside of the basin are **The Roads**, in which are from four to twelve fathoms, hard sandy bottom. This anchorage is protected from easterly winds by the breakwater before mentioned; and from northerly and northwesterly winds by a heavy stone jetty extending in about an E. by N. direction. When completed this jetty will be four hundred yards in length and, with the breakwater, will afford comparatively good shelter for vessels which are too large to enter the basin.

Block Island Basin.

The mean rise and fall of tides in the basin, as determined by the United States Engineers, is 3.05 feet; the mean duration of flood-tide 5^h 23^m, and that of ebb 5^h 55^m.

A **Life-Saving Station**, provided with all necessary apparatus, has been placed just back of the head of the basin.

As before mentioned, the northern point of entrance to Block Island Sound from the eastward is Point Judith, the southern extremity of Point Judith Neck and the western point of entrance to Narragansett Bay. It is low, grassy and cultivated, with slightly undulating surface and steep sandy faces. On its southeastern extremity is built the light-house,—to the westward of which will be seen several old unpainted frame houses. Point Judith Light-house is a white stone tower, forty-six feet high, connected with the keeper's dwelling, and shows a white light, (flashing once every fifteen seconds,) of the fourth order, from a height of sixty-seven feet above the sea, visible fourteen miles. Its geographical position is

Latitude ----- 41° 21' 38" N.
Longitude ----- 71° 28' 54" W.,

and it bears from

	Miles.
Watch Hill Light-house, E. $\frac{1}{2}$ N.	a little over 17 $\frac{1}{2}$
Little Gull Island Light-house, E. $\frac{1}{2}$ N.	about 30
Gardiner's Island Light-house, E. by N. $\frac{1}{2}$ N.	33
Montauk Point Light-house, NE. $\frac{1}{2}$ E.	about 24 $\frac{1}{2}$
Block Island North Light-house, NE. $\frac{1}{2}$ N.	a little over 9 $\frac{1}{2}$
Block Island Southeast Light-house, N NE.	13 $\frac{1}{2}$
Davis' South Shoal Light-vessel, NW. by W. $\frac{1}{2}$ W.	79 $\frac{1}{2}$
Gay Head Light-house, W. $\frac{1}{2}$ N.	29 $\frac{1}{2}$
Vineyard Sound Light-vessel, W. $\frac{1}{2}$ N.	22 $\frac{1}{2}$
Cuttyhunk Light-house, W. Northerly	24 $\frac{1}{2}$
Hen and Chickens Light-vessel, W. $\frac{1}{2}$ S.	nearly 21 $\frac{1}{2}$
Brenton's Reef Light-vessel, SW. by W. $\frac{1}{2}$ W.	a little over 6 $\frac{1}{2}$
Beaver Tail Light-house, SW. Southerly	6 $\frac{1}{2}$

Near the light-house will be seen a small building with tall chimney. This house contains the **fog-signal**,—a first-order steam-siren, giving blasts of six seconds' duration at intervals of forty seconds during thick weather. There is also a **life-saving station** on this point, supplied with all the appurtenances for rendering assistance to the shipwrecked.

From Point Judith the general course of the north shore of the Sound is **W.** for seventeen miles and a half to Watch Hill Point, the northern point of the eastern entrance to Fisher's Island Sound. The shore near the water is low, grassy and nearly level, but gradually rises with a series of gentle curves to higher wooded lands some distance back. Houses appear frequently and the whole aspect is that of a fertile and well-cultivated country. The shore is also clean and may be approached (when to the westward of Squid Ledge) within three-eighths of a mile with not less than four fathoms water.

Five miles and a quarter to the westward of Point Judith is **Rocky Point**, which shows, when viewed from the southward, a steep and ragged-looking face with a shingly beach in front. Its surface is low, somewhat undulating and cleared, and rises gradually to higher wooded lands behind.

Charlestown Inlet is two miles to the westward of Rocky Point and opens into **Ninigret** or **Pawawget Pond**. The land in its vicinity is low, level and grassy, with sandy faces, and gradually rises, as it recedes from the shore-line, to wooded hills of moderate height.

Noyes' Point is five and a half miles to the westward of Charlestown Inlet and seven and a half from Rocky Point. It is a prominent point, composed of rolling sand hills covered with grass and bare of trees, and terminates in a long rocky reef elevated a few feet above high water. Between this point and Charlestown Inlet the beach is thrown into ridges of a wavy appearance, very remarkable, especially when the sun is in the southwestern sky. On the point itself there is also a very peculiar-looking hill, with a few bushes on top, just back of the shore-line; and when seen from the eastward it presents somewhat the appearance of a vessel's hull, bottom up. The high table-land, with steep faces and a very prominent house on the summit, which will appear to a vessel approaching from the eastward as just to the northward of the point, is a marked feature of this part of the shore. On the low flat land just to the eastward of the point groups of houses are seen.

To the westward of Noyes' Point, **Narragansett Beach** extends in a nearly straight line for five miles to Watch Hill Point. The shore abreast of this beach is very bold-to,—not less than three fathoms being found within two hundred yards of it.

Watch Hill Point will be recognized, when off Noyes' Point, as a low flat point with a grey light-house attached to a white building on its southern extremity. On the higher ground back of the light-house will be seen a number of houses,—one of which is a very large square building with cupola on top. On nearing the point it will appear low and very level and somewhat like an island,—being connected with the mainland by a strip of low beach scarcely visible at two miles distance. The point has perpendicular faces, is entirely bare of trees, and terminates in a reef of bare rocks, but little elevated above high water. (See View.) Watch Hill Point is shoal in its approaches,—dangerous reefs lying to the southward of it; but there is a narrow passage between the shoals, leading into Fisher's Island Sound. To the northward of the point the land is high and hilly,—the highest eminence being a smooth hill with perpendicular faces towards the southeast, bare of trees, and occupied by several large white buildings. The hill is **Watch Hill** and the houses are summer hotels. A bare rocky islet lies off the southern extremity of the point.

Watch Hill Light-house is a square granite tower, forty feet high, attached to the keeper's dwelling, which is painted white. It shows a fixed white light, of the fourth order, from a height of sixty-two feet above sea-level, visible thirteen miles. Its geographical position is

Latitude ----- 41° 18' 12" N.
 Longitude ----- 71° 51' 32" W.,

and it bears from

	Miles.
Point Judith Light-house, W. $\frac{1}{2}$ S. -----	a little over 17 $\frac{1}{2}$
Block Island North Light-house, NW. by W. $\frac{3}{4}$ W. -----	13 $\frac{1}{2}$
Montauk Point Light-house, N. $\frac{1}{2}$ E. -----	14

From this light-house

	Miles.
Race Rock Light-house bears W. by S. $\frac{1}{2}$ S. -----	9 $\frac{1}{2}$
Little Gull Island Light-house W. by S. $\frac{1}{2}$ S. -----	12 $\frac{1}{2}$
Gardiner's Island Light-house SW. by W. $\frac{1}{2}$ W. -----	16 $\frac{1}{2}$

Near the keeper's dwelling there is a small white house; and several low red houses will be seen at the northern extremity of the point, near the beach which joins it to the mainland. Watch Hill Point is also the site of one of the Government life-saving stations, recently established for succoring those who may be in distress or have been shipwrecked.

Fisher's Island lies at the eastern extremity of Long Island Sound and on the northern side of Block Island Sound, separating the latter from Fisher's Island Sound, which lies between that island and the mainland. Fisher's Island lies about E. by N. $\frac{1}{2}$ N. and W. by S. $\frac{1}{2}$ S. and is nearly six miles long. It is easily recognizable, on approaching it from the eastward, by a prominent dark-looking hill about one-third of the way from its eastern end. This is **Chocomount**—the highest land on the island. Fisher's Island.

Fisher's Island is very irregular in shape,—its northern shore especially being much cut up by coves and small bays. Viewed from the eastward its surface appears undulating, bare of trees, and showing steep sandy faces. A single house is perched upon a hillock near the eastern end. The eastern point of the island is known as East Point and is three miles to the westward of Watch Hill Point. It is low, slightly undulating, and bare of trees, and forms the western point of the eastern entrance to Fisher's Island Sound. From this point the southern shore of the island has a general course **W SW.** for four miles and an eighth; and here will be seen a remarkable high hill, covered with grass, and sloping steeply to the southwestward, called **Prospect Hill**. In 1874 this hill was surmounted by a tall flag-staff,—serving still further to distinguish it. Appearing a little to the westward of the hill, but on the northern side of the island, will be seen **North Hill**, noticeable by reason of the large round boulders on its surface, which give it a mottled appearance. East Point.

From Mount Prospect to Race Point the distance is about one mile and a quarter. The high lands terminate in a bare sandy hill with yellow summit; and thence the height rapidly diminishes as the western end of the island is approached. The southern shore of Fisher's Island may be safely approached throughout its whole length, within half a mile, by the largest vessels,—there being not less than eight fathoms at that distance,—and in many places vessels may go within two hundred and fifty yards with not less than four fathoms. The soundings are regular and the lead a sufficient guide.

Race Point, the western extremity of Fisher's Island and the eastern point of entrance to Long Island Sound, is very low, flat and sandy, faced by boulders, and has a little grass on its summit. A hut of refuge is visible at its western end, close to the beach. About half a mile **SW. $\frac{1}{4}$ W.** from the point lies **Race Rock**, upon which is built the light-house which is a guide through **The Race**.

Race Rock Light-house shows a revolving light, of the fourth order, (flashing alternately red and white at intervals of thirty seconds with short periods of total eclipse,) from a height of sixty-eight and a half feet above the sea, visible fourteen miles. The tower is of granite, square at the base and eight-sided above, and projects from the roof of the keeper's dwelling,—a one-story house with gable roof, and also built of granite. The lantern is painted black. A bell, struck by machinery, is sounded twice in quick succession at intervals of twenty seconds during foggy weather. The geographical position of this light-house is Race Rock Light-house.

Latitude ----- 41° 14' 35" N.
 Longitude ----- 72° 2' 51" W.,

and it bears from

	Miles.
Point Judith Light-house, W. $\frac{1}{2}$ S. -----	26 $\frac{1}{2}$
Block Island North Light-house, W. by N. -----	20 $\frac{1}{2}$
Montauk Point Light-house, NW. by N. $\frac{1}{2}$ N. -----	13 $\frac{1}{2}$
Watch Hill Light-house, W. by S. $\frac{1}{2}$ S. -----	9 $\frac{1}{2}$
Gardiner's Island Light-house, NE. -----	7 $\frac{1}{2}$
Little Gull Island Light-house, NE. by E. $\frac{1}{2}$ E. -----	3 $\frac{1}{2}$

Little Gull Island, four miles **SW. by W. $\frac{1}{4}$ W.** from Race Point, marks the southwestern side of the eastern entrance to Long Island Sound and is three miles and a half from Race Rock Light-house. The island is very small and low and is occupied only by the light-house and the keeper's dwelling. Little Gull Island Light-house is a granite tower seventy-four feet high, connected with the keeper's dwelling, which is of red sandstone with granite trimmings,—both tower and dwelling standing on a protecting pier of granite. It shows a fixed Little Gull Island and Light-house.

white light, of the second order, from a height of ninety-two feet above the sea, visible seventeen miles; and marks the southwestern side of the eastern entrance to Long Island Sound, as Race Rock Light-house marks the northeastern side. Its geographical position is

Latitude ----- 41° 12' 21" N.
Longitude ----- 72° 6' 26" W.,

and it bears from

	Miles.
Race Rock Light-house, SW. by W. $\frac{1}{2}$ W. -----	3 $\frac{1}{2}$
Watch Hill Light-house, W. by S. $\frac{1}{2}$ S. -----	12 $\frac{1}{2}$
Point Judith Light-house, W. $\frac{1}{4}$ S. -----	30
Block Island North Light-house, W. $\frac{1}{2}$ N. -----	23 $\frac{1}{2}$
Montauk Point Light-house, NW. $\frac{1}{4}$ W. -----	14
Gardiner's Island Light-house, NE. by N. $\frac{1}{2}$ N. -----	a little over 4 $\frac{1}{2}$

A second-order steam fog-siren (in duplicate) is placed at this light station, and gives blasts of five seconds' duration, at intervals of forty seconds, during thick or foggy weather.

Great Gull Island lies three-eighths of a mile to the westward of Little Gull Island, and is half a mile long in an ENE. and W SW. direction. It is low and nearly level, covered only with grass, and shows sandy faces here and there. Near its eastern end the land is somewhat higher and perfectly flat on top, with steeply sloping faces,—giving it the appearance of an earth-work. There is no passage between this island and Little Gull Island; but to the westward, between it and Plum Island, there is a channel about a mile and three-quarters wide with from three to six fathoms at low water. This channel is, however, very dangerous and should never be attempted by strangers,—being obstructed by Old Silas and Bedford Reef, which lie nearly in the middle of the passage.

Gardiner's Island lies at the western end of Block Island Sound,—separating it from Gardiner's Bay. It lies nearly NNW. and S SE., is five miles and three-quarters long and very irregular in shape. About midway between its northern and southern ends it is widest,—being nearly three miles wide in an E. by S. and W. by N. direction; but from this point it rapidly diminishes in width towards its northern and southern ends,—the former especially being a mere narrow sand-spit but little above high-water mark, while the latter retains an average width of five-eighths of a mile to within three-quarters of a mile of its southern end, whence it rapidly contracts, and the island terminates in a low sandy point about one hundred yards wide. When seen from the eastward this island shows high, perpendicular, yellow sand cliffs and a rolling surface, bare of trees—except to the southward of Eastern Plain Point, (the easternmost point of the island,) where the land descends gently towards the southern point, and a growth of low trees are seen back of Tobacco-lot Bay. To the northward of the cliffs another thick growth of trees will be visible, crowning the summit of a bluff head, from the base of which the island extends to the northward in a long flat beach to Gardiner's Point,—the northern extremity of the island.

On Gardiner's Point is built Gardiner's Island Light-house, marking the southern point of entrance to Gardiner's Bay. It is a circular brick tower, twenty-six feet high, painted brown, and attached to the keeper's dwelling, which is of the same color. It is very difficult to recognize as a light-house until close to it, and it has, therefore, been recommended that the tower be raised or painted a different color from the house. It shows a fixed white light, of the sixth order, from a height of thirty-three feet above the sea, visible eleven miles. Its geographical position is

Latitude ----- 41° 8' 29" N.
Longitude ----- 72° 8' 44" W.,

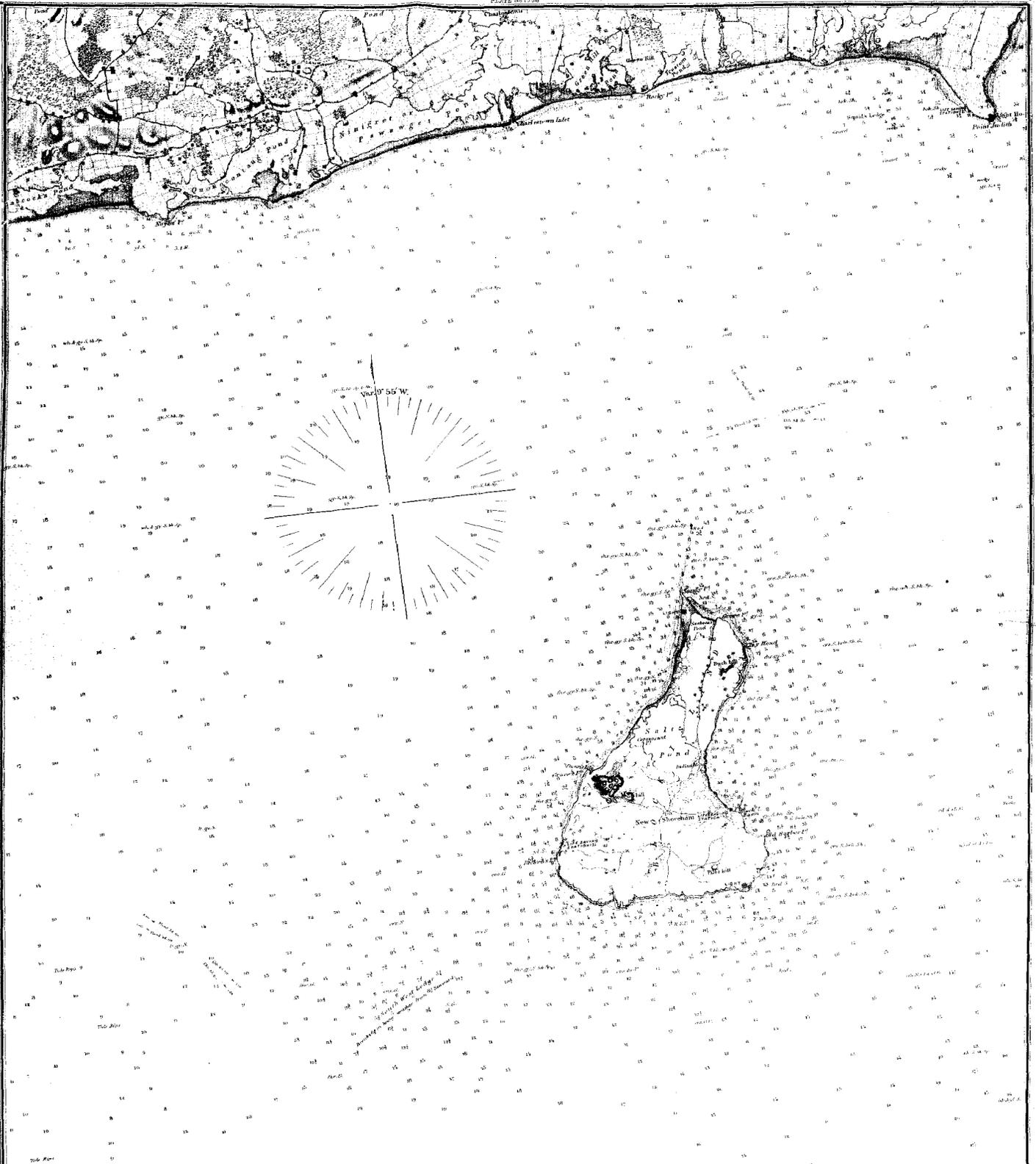
and it bears from

	Miles.
Little Gull Island Light-house, SW. by S. $\frac{1}{2}$ S. -----	4 $\frac{1}{2}$
Race Rock Light-house, SW. -----	7 $\frac{1}{2}$
Watch Hill Light-house, SW. by W. $\frac{1}{2}$ W. -----	16 $\frac{1}{2}$
Point Judith Light-house, W. by S. $\frac{1}{2}$ S. -----	33
Block Island North Light-house, W. $\frac{1}{2}$ S. -----	26 $\frac{1}{2}$
Montauk Point Light-house, NW. by W. $\frac{1}{2}$ W. -----	13 $\frac{1}{2}$

On the western side of Gardiner's Island, between Gardiner's Point and the high land forming the main body of the island, is a large cove with clean shores, in which excellent anchorage may be found in from eighteen to twenty-three feet, protected from all winds except those from the westward. It is called **Bostwick's Bay**.

Eastern Plain Point, the easternmost point of Gardiner's Island, is of moderate height, slightly undulating, and bare of trees. It is shoal in its approaches and should receive a berth of not less than five-eighths of a mile from vessels approaching it from the eastward or bound into Napeague Bay. On its southern side there is formed by the curve of the shore a large but very shallow cove, called **Tobacco-lot Bay**, easily recognized by the wooded lands behind it.

From Eastern Plain Point the eastern shore of Gardiner's Island has a general course S. by W. $\frac{1}{2}$ W. for three miles to the southern end of the island. All this shore is low, bare of trees, and very slightly undulating. It should not be approached from the eastward nearer than a mile, as it is very shoal in its approaches.



BLOCK ISLAND SOUND
FROM POINT JUDITH TO NARRAGANSETT BEACH

BUOYS

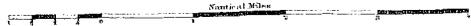
- Red Buoy to be left to starboard
- Black Buoy to be left to starboard
- Black and Red horizontal stripes, Danger Buoy
- Black and White perpendicular stripes, Channel Buoy

Scale in Fathoms

1880

Natural Scale

SOUNDINGS
 Soundings in Fathoms at mean low water
 Depths less than 3 fathoms in feet on a shaded surface



The southern point of the island is connected by a reef of rocks half a mile long with a low, flat, sand islet, called Ram Island. This islet, which lies **N NE.** and **S SW.**, is three-quarters of a mile long, destitute of all vegetation, and surrounded by very dangerous shoals. Its southern end is separated from the northern shore of Long Island by a passage a mile and three-eighths wide connecting Napeague and Gardiner's bays. It is, however, full of shoals and entirely unfit for strangers.

Ram Island.

Montauk Point is the eastern extremity of Long Island and the western point of entrance to Block Island Sound from the southward. On approaching it from the eastward it will appear as a high sandy bluff, with perpendicular faces, and somewhat undulating surface covered only with grass. Perched upon the top of the bluff and close to its edge stands the light-house, with the keeper's dwelling and the hut containing the fog-signal at its base. To the northward the land gradually descends,—still, however, retaining its precipitous appearance, while to the southward the shore appears to be penetrated by several small coves, which break up the line of the cliff so as to present an appearance of alternate low grassy lands and high perpendicular sandy bluffs. The entrance into Block Island Sound, between Montauk Point and Block Island, is about twelve miles and an eighth in width and almost entirely unobstructed.

Montauk Point.

Montauk Point Light-house is a white stone tower, ninety-nine and a half feet high, and shows a fixed white light, varied by flashes every two minutes, from a height of one hundred and sixty-nine and a half feet above the sea, visible twenty miles. The lens is of the first order and the flashes are visible from three to four miles farther than the fixed light, so that when first made it will appear as a revolving white light. The keeper's dwelling, which is painted brown, stands on the hill adjacent to the light-house. The fog-signal is a Daboll air-trumpet of the first order, giving blasts of twelve seconds' duration, at intervals of fifty seconds, during foggy weather.

Montauk Point Light-house.

The geographical position of Montauk Point Light-house is

Latitude ----- 41° 4' 13" N.
Longitude ----- 71° 51' 27" W.,

and it bears from

	Miles.
Davis' South Shoal Light-vessel, W. by N. $\frac{1}{4}$ N. -----	91 $\frac{1}{2}$
Gay Head Light-house; W. by S. Southerly -----	49 $\frac{1}{2}$
Block Island Southeast Light-house, W. by S. Southerly -----	14 $\frac{1}{2}$
Block Island North Light-house, SW. by W. $\frac{1}{2}$ W. -----	15 $\frac{1}{2}$
Point Judith Light-house, SW. $\frac{1}{4}$ W. -----	24 $\frac{1}{2}$
Watch Hill Light-house, S. $\frac{1}{4}$ W. -----	14

From this light-house

	Miles.
Race Rock Light-house bears NW. by N. $\frac{1}{4}$ N. -----	13 $\frac{1}{2}$
Little Gull Island Light-house NW. $\frac{1}{4}$ W. -----	14
Gardiner's Island Light-house NW. by W. $\frac{1}{4}$ W. -----	13 $\frac{1}{2}$

From Montauk Point the shore takes a general direction about **NW. by W. $\frac{1}{4}$ W.** for two miles and a quarter to Shagwong Point. It is for the most part low and sandy, with occasional sand hillocks and groups of trees on the higher grounds. Shagwong Point is low and nearly level, the land rising very gradually to the southward for about half a mile back from the shore-line, where there is a hill with a grove of trees on top. The approaches to this point are shoal, and vessels of larger draught than ten feet should not approach nearer than two miles and a half, as the dangerous Shagwong Reef lies two miles **N. by W.** from the point.

Shagwong Point.

From Shagwong Point the trend of the shore is **W. $\frac{1}{4}$ S.** for two miles and a half to Culloden Point, and is composed for the most part of low sandy lands and many sand hillocks covered with grass, and, at long intervals, a few trees. Culloden Point is somewhat higher than the land to the eastward of it, but is also sandy, bare of trees, and covered only with a sparse growth of grass. At this point the shore turns abruptly and runs **S. $\frac{1}{4}$ E.** for a mile and a half, then sweeps with a regular curve around to the westward and northwestward, thus forming a large semicircular indentation called Fort Pond Bay. From Culloden Point the eastern shore of this bay is composed of hills of moderate height, separated by small valleys intersected by ravines, which give the land an undulating appearance. The country appears barren and desolate,—there being no settlements and the only growth a thin grass. At the head of the bay the shore is low and flat, but its western shore is higher and shows thick groves of trees here and there. Fort Pond Bay is a mile and an eighth wide, has a depth of from four to eight fathoms, and affords excellent shelter in southerly and easterly weather. The holding-ground is good and the harbor perfectly unobstructed,—it being only necessary to keep about a quarter of a mile from either shore.

Fort Pond Bay.

Rocky Point is the western point of entrance to the bay, and is a mile and seven-eighths to the southwestward of Culloden Point. It is low and covered only with grass, with a few trees on the higher lands back of the point and a fringe of rocks along the bay shore.

From Rocky Point the shore runs first about **W. $\frac{1}{4}$ N.** for half a mile, where it turns abruptly and runs **SW. $\frac{1}{4}$ W.** for two miles and a quarter; thence it turns to the westward with a regular curve for a mile and a quarter,—thus forming the southern shore of Napeague Bay. The whole of this shore is sandy and nearly level, with thick groves of trees at short intervals.

Napeague Bay is bounded on the west by Gardiner's Island (already described) and by the small island, called Ram Island, lying off the southern end of the former. It is about four miles wide with a depth of from four to eight fathoms; but is of little importance as an anchorage,—much better shelter being found in Fort Pond Bay. Its southern shores are comparatively clean and may be safely approached within half a mile with not less than three fathoms throughout their whole length; but its western shores are foul,—long shoals making out to the eastward from Ram Island to a distance of two miles and an eighth. Sixteen feet at low water is found at that distance from the island and five feet at a distance of two miles.

At the bottom of the bight which forms Napeague Bay lies Napeague Harbor,—a cove of irregular shape and about a mile in diameter, which penetrates the northern shore of Long Island nearly four miles to the westward of Fort Pond Bay. Its entrance is much contracted by a sandy islet of irregular shape and about three-eighths of a mile long, known as **Goffe's Island**. This island lies on the western side of the entrance, presents a somewhat undulating surface, bare of trees, and contracts the entrance to the harbor to a width of three hundred and fifty yards. Seven feet at low water may be taken into this harbor; but strangers must, under no circumstances, attempt to enter it, as the channel is narrow, crooked and full of shoals, few of which are marked.

The eastern shore of Gardiner's Island should not be approached nearer than five-eighths of a mile except in the vicinity of Tobacco-lot Bay, where it should receive a berth of a mile and an eighth.

As Block Island Sound is important only as the approach to Long Island Sound, Fisher's Island Sound and Gardiner's Bay, a description of the dangers to be avoided in crossing it will be given under the head of "Dangers" in approaching and entering those thoroughfares from the eastward.

FISHER'S ISLAND SOUND.

This important thoroughfare lies between the mainland of Connecticut on the north and Fisher's Island on the south, and is a little over seven miles long. On its northern side lie the important harbors of Stonington and Mystic, and on its southern side there are convenient anchorages formed by indentations on the northern shore of Fisher's Island. On the east it opens into Block Island Sound between Watch Hill Point and the eastern end of Fisher's Island, known as East Point; and on the west it unites with Long Island Sound on a line between Race Point and Pine Island,—a small island lying just to the eastward of the entrance to New London. It is not considered safe for strangers on account of the dangerous line of reefs between East Point and Watch Hill Point; but in the daytime, and with ordinary care, the channels among these reefs may be safely navigated by any one having a book of directions.

In approaching this Sound from the eastward, the most prominent object visible is Watch Hill Point, which will appear to a vessel off **Noyes' Point**, (five miles to the eastward,) as a low point with a grey light-tower and white dwelling on its extremity; while to the northward and eastward the land is much higher,—rising to the summit of a smooth hill with perpendicular sides and nearly level top, on which are seen several large white buildings, the most prominent of which is surmounted by a tall cupola. The hill is **Watch Hill** and the buildings are summer hotels.

On the western side of the entrance will be seen **Chocomount**, on Fisher's Island, and will appear as a long dark-looking hill, bare of trees, with somewhat steeply sloping sides, about one-third of the way from the eastern end of the island.

East Point, which is the name given to this eastern end, is low, slightly undulating, and bare of trees. A small rocky island, called **Wicopesset Island**, lies a quarter of a mile to the eastward of it,—leaving a narrow channel between them, which is, however, much obstructed and rarely used.

From Watch Hill Point the northern shore makes in a regular semicircular curve to the westward,—thus forming a cove in which from two to three fathoms at low water may be found. This part of the shore is a mere sand beach, covered with grass, and separates this entrance from **Little Narragansett Bay**,—a wide but shallow bay contained

between Watch Hill peninsula and the mainland. The beach is known as **Napatree Beach** and its western extremity as **Napatree Point**. This point is a mile and a quarter to the westward of Watch Hill Point, is grassy and bare of trees, has a single house upon it, and terminates in a line of rocks with steep faces. Here the shore turns abruptly to the northward,—running about **N. $\frac{1}{4}$ E.** for one mile to **Sandy Point**. This is also a mere low strip of sand, covered with grass, and has a single small hillock near the extremity of the point. It forms the southern point of

entrance to **Little Narragansett Bay**. There are extensive shoals along the whole of this shore from **Napatree Point** to **Sandy Point**; but they are only in the way of vessels bound to Stonington or into **Little Narragansett Bay**. Vessels bound through the Sound keep nearer to Fisher's Island; and, when to the westward of **Napatree Point**, will open the village of Stonington, about a mile and three-quarters to the northward.

The light-house, which is the guide for Stonington Harbor, will be seen on the extremity of the point upon which the village is built, and which is known as **Windmill Point**. It is also the northern point of entrance to **Little Narragansett Bay**,—the distance between it and **Sandy Point** being a little over three-quarters of a mile.

Near the southern end of **Windmill Point**, on a gentle grassy slope, is built **Stonington Light-house**, which will appear as a white tower rising from the roof of a dwelling of the same color. It shows a fixed white light, of the sixth order, from a height of fifty-nine and a half feet above the sea, visible eleven miles. Its geographical position is

Latitude ----- 41° 19' 41" N.
 Longitude ----- 71° 54' 21" W.

Little Narragansett Bay should not be entered by strangers. There is eleven feet in the channel at the entrance, close under the northern shore; but the depth rapidly decreases after passing Elibn's Island, and not more than three feet at low water can be taken into Pawcatuck River. (See description, given hereafter.)

The village of **Stonington** is built on the eastern side of a large cove making in to the northward, between Windmill Point on the east and Wamphassuck Point on the west. It is a place of some importance, especially during the summer,—being in the vicinity of the hotels at Watch Hill and being the terminus of the New York and Stonington line of steamers,—a favorite route to Boston during the summer. There is also some manufacturing interest; and a large stone factory with cupola on top is one of the most conspicuous objects on approaching the harbor, and will be seen just to the westward of the light-house. The harbor is narrow, and not more than eight feet at low water can be carried up to the steamboat wharf.

Stonington Harbor.

Wamphassuck Point, the western point of entrance to Stonington Harbor, is long, low and gently sloping, bare of everything except a scanty growth of grass, and having bare ledges cropping out all over its surface. To the northward it rises **Wamphassuck Hill**, which is, however, not at all conspicuous,—being a mere grassy summit about forty-five feet high, with a few houses on its eastern slopes. Just to the westward of it rises **Palmer's Hill**, another smooth grassy hill, somewhat more than a hundred feet high, and having a single house upon its summit.

Wamphassuck Point.

The anchorage opposite Stonington is protected by a stone breakwater extending southeasterly from near Wamphassuck Point. It is intended to extend this breakwater to a length of two thousand feet.

From Wamphassuck Point the northern shore of the Sound has a general course about NW. $\frac{1}{4}$ N. for a mile to Quiambog Cove, which runs to the northward,—washing the western face of Palmer's Hill. The shore-line between these two points is much cut up by small coves and other indentations and is not especially remarkable,—being gently sloping, low, and backed by woods, which appear not in an unbroken mass, but standing in small groves with cleared spaces between. The whole of this northern shore is exceedingly foul and very dangerous for strangers, although there are several good channels among the reefs, which are frequently used by those acquainted with them.

Five-eighths of a mile to the westward of Wamphassuck Point and a quarter of a mile from the northern shore lies a bare islet, about a hundred yards long, known as **Schruches' Island**. There is no passage inshore of it,—the space between it and the main shore being studded with bare and sunken rocks.

Quiambog Cove is of no importance,—there being scarcely any water in it at low tide. From its mouth the shore takes a turn about W. by S. $\frac{1}{4}$ S. for three-quarters of a mile to the eastern entrance to Mystic River. It partakes much of the same general character as that to the eastward of the cove, but is more hilly, with many bare ledges cropping out on the slopes, and occasional groves of trees.

In the eastern entrance to Mystic River lies Dodge's Island, about half a mile long in a N. and S. direction, somewhat hilly, and covered only with grass. It is composed of two parts, connected by an isthmus about fifty yards wide, and its easternmost point is not quite a hundred yards from the mainland,—there being no passage between them.

Dodge's Island.

About four hundred yards to the westward of Dodge's Island lies **Mason's Island**,—separating the Eastern from the Western or Main Entrance to Mystic River. It is a mile and a quarter long in a N. and S. direction and has an average width of half a mile. Seen from the southward it will appear as low land, rising gradually to a high hill whose summit and slopes are thickly covered with woods; but the northern half of the island is all low, nearly level and grassy, and has a small settlement on it. Near its northern end this island is connected with the mainland by a causeway about seventy-five yards long, which thus shuts off all communication with Mystic River by the Eastern Entrance and confines the waters between the island and the mainland to a broad and shallow cove of no importance.

Mason's Island.

The southern end of **Mason's Island** is called **Mason's Point**, and is low, flat, and covered with grass. It is comparatively bold-to,—the North Channel running close under it and twelve feet at low water being found within fifty yards of it. Between this point and **Morgan's Point** (the western point of entrance to Mystic River) the distance is a mile, but three-fourths of this width is occupied by the extensive **Mason's Island Flats**.

Mason's Point.

About four hundred yards to the eastward of **Mason's Point** lies a gently sloping grassy island called **Baker's Island**. It is about four hundred yards long in a N. E. and S. W. direction, of an oval shape, and its greatest width is nearly one hundred and seventy-five yards. There is no passage between it and **Mason's Island**, but eleven feet at low water may be taken between it and a very small rocky islet, called **Bush Island**, lying four hundred yards to the eastward of it and about three hundred and fifty yards S. W. by S. from the southern end of **Dodge's Island**. **Bush Island** is surrounded by rocks and sunken ledges and it is not safe to approach it nearer than one hundred and fifty yards.

Baker's Island.

About six hundred and fifty yards S. of **Mason's Point** lies a small, low, round island, about seventy-five yards in diameter and bare of trees, called **Gates' Island**. It lies between the two channels, forming one of the line of reefs and islands separating the North from the Main Channel; but there is a good passage, with fifteen feet, between this island and **Ellis' Reef**, which leads from the Main Channel into the North Channel, or into Mystic River. It is not safe, however, to approach **Gates' Island** closely from the southward on account of dangerous sunken reefs, which lie along the northern edge of the Main Channel between that island and **Ram Island**.

Gates' Island.

Ram Island, or **Bradford's Island** as it is sometimes called, lies off the middle of the Main Entrance to Mystic River,—its northern end being about midway between Mason's Point and Morgan's Point. It is very irregular in shape,—being formed by a narrow strip of land about six hundred yards long, lying about **SW. by S.** and **NE. by N.**, and terminating at its southern end in another narrow strip of the same length, lying **E. by N.** and **W. by S.**, on which is built a large hotel with a few trees around it. The rest of the island is covered only with grass. It is not safe to approach this island from any

Ram Island. direction, although there is a passage with ten feet at low water between it and Gates' Island. On its northern side a long reef extends in a northeasterly direction three hundred and fifty yards. On its southern side another, called **Ram Island Reef**, extends **SSE.** half a mile, with a narrow slue across it, in which there is five fathoms. Half a mile **W. by S. ½ S.** from its southwestern end there is a sunken reef with eight feet at low water, and the whole of its western side is occupied by the extensive **Ram Island Flats**,—a mass of flats and ledges, some of which are bare at all times, others only at low water, and others having from two to three feet upon them. A small bare islet, about a hundred yards long, will be seen near the western edge of these flats, about three hundred and fifty yards to the westward of Ram Island, and between six and seven hundred yards to the southward of Morgan's Point. It is called **Little Ram Island**.

Morgan's Point, the western point of entrance to Mystic River, when seen from the southward will appear low and rocky, with a little grass on top, and a white dwelling surmounted by a low tower a little way back from the pitch of the point. The land to the northward rises gradually to a grassy summit, with many bare ledges cropping out over its surface, and the village of **Noank** will be seen on its eastern slopes. Morgan's Point Light-house shows a fixed white light, of the sixth order, from a height of sixty-one feet above the sea, visible eleven miles. Its geographical position is

Latitude ----- 41° 18' 57" N.
Longitude ----- 71° 59' 23" W.

The lantern rises from the centre of the keeper's dwelling.

The southern shore of **Fisher's Island Sound** is, as before remarked, formed by the northern side of **Fisher's Island**, and may be generally described as an undulating and rolling country, formed by a series of grassy hills. From East Point (the eastern extremity of the island, as before mentioned) this shore takes a general course **W. ½ N.** for three-quarters of a mile to the base of a gently sloping hill, on the summit of which will be seen a large house surrounded by outbuildings. The hill is **Winthrop's Hill** and the house **Winthrop's House**,—the latter being a prominent landmark for the approach to East Harbor, on the eastern side of which it stands.

East Harbor is a large cove of very irregular shape, indenting the northern shore of **Fisher's Island** on the western side of **Winthrop's Hill**. It has an average width of three-eighths of a mile and good anchorage in from eleven to fourteen feet; but it is obstructed by a dangerous rock *awash*, which lies about an eighth of a mile from the eastern shore and almost directly in the middle of the channel. The shores of the harbor are undulating, grassy, and bare of trees.

To the westward of East Harbor the most conspicuous object on the island, and indeed one of the most conspicuous in the whole Sound, is **Chocomount**,—a smooth round hill, with regular slopes, and about one hundred and fifty feet high. It is so noticeable that it is used as a landmark not only by vessels passing through this Sound, but also by those approaching Long Island Sound from the eastward. The land between **Chocomount** and East Harbor is low and somewhat undulating, and a thick grove of trees will be seen at the eastern base of the mount, about one hundred and fifty yards back from the beach. This part of the northern shore of the island runs about **W. by N.** from East Harbor to **Hawk's Nest Point**, (at the northern base of **Chocomount**.) a distance of three-quarters of a mile. This point is low and flat, fringed with rocks, and covered only with grass.

From **Hawk's Nest Point** to **Clay Point** the direction is **W.** and the distance seven-eighths of a mile; but between the two points the shore is indented by a wide cove in which from ten to thirteen feet water may be found. It is not, however, recommended as an anchorage. The land between these two points is lower than that to the eastward of **Chocomount**, but still rolling and hilly, and is bare of trees until near the eastern shore of West Harbor, where there is a grove and a great number of lone dead trees, which have a singular and skeleton-like appearance.

In coming through the Sound from the eastward, when abreast of **Winthrop's Hill** a low flat islet will be seen to the southward of the course and about a mile off. This is **East Clump**, lying about a mile **NW. by W. ½ W.** from **Winthrop's House** and three-quarters of a mile from the northern shore of **Fisher's Island**. It is about one hundred and twenty-five yards long, very narrow and comparatively bold-to, and may be approached on all sides within one hundred and fifty yards with not less than five fathoms. The deepest water is on the northern side of the clump, where there is twelve fathoms; but a very good and wide channel exists on its southern side and between it and **Middle Clump**, where there is not less than four fathoms throughout a width of half a mile.

Middle Clump consists of two very small, low, flat islets, lying three-quarters of a mile to the westward of **East Clump** and five-eighths of a mile **NW. ½ N.** from **Hawk's Nest Point**. It is nearly opposite to **Ram Island**,—bearing **S. ½ W.** from the hotel on its southern end, a mile and an eighth distant. Sunken reefs surround it, and it is not safe to approach it within three hundred and fifty yards except on its northern side, where six fathoms will be found within less than two hundred yards of the clump. The channel between this clump and the buoy on

Ram Island Reef is five-eighths of a mile wide and has from five to eleven fathoms in it; but there is also a good channel between it and Fisher's Island, through which not less than sixteen feet can be taken past Clay Point and into West Harbor. The latter channel is, however, not marked, and should not be used by strangers unless they are of less than nine feet draught.

A little over five-eighths of a mile to the westward of Middle Clump lies a group of low rocky islets surrounded by reefs, and known as West Clump. They extend in a nearly E. and W. direction for about an eighth of a mile,—the centre of the clump bearing N. by W. $\frac{3}{4}$ W. from Clay Point, three-eighths of a mile distant, and E. $\frac{1}{2}$ S. from North Hammock Light-house, nearly a mile and a quarter distant. Dangerous sunken reefs lie both to the eastward and westward of this clump, but it may be safely approached on its northern side within two hundred yards, and on its southern side within three hundred and fifty yards, with not less than five fathoms water.

West Harbor is a large bay or cove making in on the northern side of Fisher's Island on the western side of Clay Point, and affords good anchorage in from eight to sixteen feet, muddy bottom. The entrance, between Clay Point and West Point, is about a mile wide; but abreast of West Point the width is only five-eighths of a mile; and thence it gradually contracts to the head of the harbor, where it is only about three hundred yards wide. The shores are entirely cleared, slightly undulating, and covered with grass except in a few places where there are cultivated fields. A short distance back from the eastern shore there are some groves of trees, among which are noticeable a number of dead trees standing wide apart and having a peculiarly gaunt appearance. A prominent landmark for this harbor is Prospect Hill, or Mount Prospect as it is sometimes called, which rises on the southern side of Fisher's Island, just to the southward of the head of the harbor. It is a smooth round hill, about a hundred and thirty feet high, sloping gently to the northward, and is surmounted by a flag-staff. On its southern side, however, which is towards Block Island Sound, it presents steep faces,—descending somewhat abruptly to the beach.

Another noticeable landmark for West Harbor is a large house, surrounded by a number of outbuildings, standing about a quarter of a mile back from the western shore at the base of a rather steep hill. This is called West House and is connected by a road with a wharf on the western shore of the harbor.

Clay Point, the eastern point of entrance to West Harbor, is composed of smooth, gently sloping, grassy land, behind which, at some distance, will appear a grove of trees. It is comparatively bold-to and may be approached within one hundred and fifty yards with five fathoms water. This point on with North Hill leads safely into the channel between Middle Clump and Hawk's Nest Point with not less than thirteen feet at low water. West Point, the western point of entrance, is also grassy and gently sloping, but somewhat higher than Clay Point. It is shoal in its approaches, and vessels in going into the harbor should keep about three hundred yards from it.

From West Point the northern shore of Fisher's Island has a general course about NW. by W. for five-eighths of a mile,—the land being still of moderate height and slightly undulating until the northwestern extremity of the island is reached, where North Hill rises steeply to a height of one hundred and twenty feet, its surface dotted with large round boulders which give it a curiously mottled appearance.

The high lands at the southwestern end of the island terminate in a bare sandy hill with yellow summit; and thence the land rapidly descends to Race Point, which is very low and flat, with a little grass on top and fringed with boulders. The low house visible on the extremity of the point is a house of refuge belonging to the Life-Saving Service; and just to the southwestward of it will be seen the light-house,—standing apparently in the water. This light-house is on Race Rock and is one of the guides to the eastern entrance of Long Island Sound.

Off the mouth of West Harbor lie several small islands,—forming the continuation of the line of which East, Middle and West clumps are a part. Of these, Flat Hammock is the first met with after passing West Clump, and appears low, flat and grassy, and about three hundred and fifty yards long in a N. and S. direction, with a dry reef extending to the northeastward two hundred and fifty yards farther. It is about five-eighths of a mile to the westward of West Clump, and between them is a good channel three hundred yards wide, with not less than twelve feet at low water, leading into West Harbor. The mark for this channel (which is not buoyed) is a clump of trees on Groton Long Point in range with a large house near the summit of Fort Hill on a bearing of N. $\frac{1}{2}$ E.

Next to the westward of Flat Hammock and about three hundred and fifty yards from it lies South Hammock, sometimes called the South Dumping. It is easily recognizable,—having steeply sloping shores, covered with grass, which give it the appearance of an earth-work. A single house and a few trees are the only other distinguishing marks. The island lies NE. by E. and SW. by W. and is nearly four hundred yards long. A bar with five feet upon it connects it with Flat Hammock, so that there is no passage between them except for very small vessels.

Between South Hammock and the northwestern end of Fisher's Island leads the western channel into West Harbor. It is about an eighth of a mile wide with not less than sixteen feet at low water, and is safe to enter, as the reef off Northwest Point is buoyed.

About six hundred yards N. by W. $\frac{1}{2}$ W. from South Hammock lies the westernmost island of the group, called North Hammock, and sometimes North Dumping, easily recognizable by the light-house upon it. It is nearly round, about two hundred yards in diameter, with steeply sloping sides covered with grass, giving it somewhat the appearance of an earth-work; and on its eastern face it is fringed with boulders. The light-house is on

the keeper's dwelling, which is a white building with mansard roof. The light is fixed red, of the sixth order, shown from a height of seventy and a half feet, and visible eleven miles. It is in

Latitude ----- 41° 17' 14" N.
Longitude ----- 72° 1' 11" W.

A fog-bell, struck by machinery at intervals of fifteen seconds, during thick weather, is suspended in an open frame-work on top of a low wooden building close to the dwelling.

North Hammock Light-house bears from Eel Grass Light-vessel **W.** by **S.**, three miles and five-eighths distant, and from Race Rock Light-house **NE.** by **N.** Northerly, nearly three miles distant. Bartlett's Reef Light-vessel bears **W. ½ S.**, a little over five miles distant, and New London Light-house **NW. ¾ W.**, three miles and five-eighths distant.

On the northern side of the Sound the shore to the westward of Morgan's Point forms a large and wide cove of very irregular shape, into which empties a small stream which is almost entirely bare at low water. The cove is also shallow,—having from four to eight feet in it, and is rarely used. The shores are composed of gently sloping grass lands with bare ledges cropping out here and there and thick woods in the background. **Fort Hill**, a high, smooth, grassy hill, with a large house on its southern side, near the summit, will be seen about two miles back,—rising above the thick woods at its base.

Groton Long Point, the western point of entrance to the large cove above mentioned, is a long, low, flat point, covered with grass and a great many scattered boulders, and backed by thickly wooded slopes, presenting in summer a beautiful appearance. A long reef of rocks makes off from it to the southward for two hundred yards and has on its southern end a spindle surmounted by a cage. Large vessels may pass within one hundred yards of this spindle with not less than sixteen feet at low water.

On the western side of Groton Long Point is formed another large cove called **Mumford's Cove**,—the larger portion of which is bare at low water. Its western point, called Bluff Point, or Mumford's Point, is nearly a mile **NW.** by **W. ½ W.** from the spindle on Groton Long Point; and between the two, in the southern part of Mumford's Cove, anchorage in from seven to eighteen feet is found; but it is rarely used. The dangerous **Horse-Shoe Reef** lies in the entrance to this cove, about three-eighths of a mile **SE.** by **S. ½ S.** from Bluff Point.

Bluff Point, or **Mumford's Point**, is the northern point of the western entrance to Fisher's Island Sound. It is low, flat and grassy,—being very much like Groton Long Point in appearance, and receives its name from a somewhat steep hillock on its western side close to the beach. There are a few trees in groves a little way back from the shore, but the land is for the most part under cultivation. A reef, dry at low water and covered with scattered boulders, makes off to the southward about two hundred yards. It is quite bold-to and at low water may be safely approached within one hundred and twenty-five yards with not less than three and a quarter fathoms.

CHANNELS INTO FISHER'S ISLAND SOUND.

The line of reefs extending from Watch Hill Point to East Point separates the eastern entrance to this Sound into a number of channels,—all of which have good water in them; but only a few are available for navigation owing to the contracted limits of the majority and the strong set of the tidal currents. Of these channels, the easternmost and best for vessels from the eastward is called **Watch Hill Passage**,—the entrance being between the point of that name and Watch Hill Reef. It is two hundred and fifty yards wide and has four and a half fathoms at low water of spring tides. Next to the westward of this channel is **Sugar Reef Passage**,—three-eighths of a mile wide, and contained between Watch Hill Reef on the east and Sugar Reef on the west, with not less than three and three-quarter fathoms. This is a dangerous channel notwithstanding its width, as the set of the tidal current is directly upon the reefs. To the westward of Sugar Reef Channel is **Catumb Passage**, leading between Sugar Reef on the east and Catumb Rocks on the west. It is a quarter of a mile wide and has five fathoms at low water of spring tides. The same objection prevails with regard to this channel as in the case of Sugar Reef Channel, viz: The set of the tidal current upon the reefs.

On the western side of Catumb Rocks is another passage, an eighth of a mile wide, with four fathoms at low water. It leads between Catumb Rocks and a detached sunken reef with eight feet at low water; but is never used except by small vessels whose masters are familiar with the locality. Another passage, a quarter of a mile wide, with eighteen feet at low tides, leads between this reef and what is known as **East Spindle**, which is built upon a long sunken reef about five-eighths of a mile to the eastward of Wicopesset. This passage is good at slack tide if Stonington Light-house can be seen, as with that light-house bearing **N. ½ W.** the reefs on both sides will be avoided; still it is not recommended for strangers.

On the western side of the reef on which East Spindle stands and between it and Wicopesset Rock leads **Lord's Passage**,—the Main Entrance to the Sound from the southward. Its average width is three hundred and fifty yards and a depth of three and a half fathoms can be taken through it with safety. It has also the advantage that the set of the tidal current, though strong, is not so directly across the axis of the channel as in those to the eastward of it. The entrance is between East Spindle and a sunken reef with thirteen feet upon it lying about six hundred and fifty yards to the southeastward of Wicopesset Island. Between these two reefs it is a quarter of a mile wide; but the deep-water channel (that which has more than three fathoms at low water) is only about two hundred yards wide,—the shoal water extending half a mile southeasterly from Wicopesset. Wicopesset Rock is surmounted by an iron spindle known as **West Spindle**. Between Wicopesset Island and East Point is **Wicopesset Passage**,—the westernmost passage into the Sound. It is in no place less than one hundred and fifty yards wide, with not less than sixteen feet, and may be safely attempted if the range can be seen, which is the spindle on Latimer's Reef bearing **NW. ½ N.** and just open to the southward of the summit of the wooded hill on Mason's Island. The tidal current sets nearly in the direction of the channel.



Spindle

Fisher's Id.

Spindle

Lt. Ho. Watch Hill

Hotel

View of Approaches to Fisher's Id. Sound from the Eastward alongshore, Light House on Watch Hill bearing W. $\frac{1}{2}$ N. distant 21 Miles.



Chocomaunt

Noank Village

Myrtle Village

Lt. Ho. Watch Hill

View of Approaches to Fisher's Id. Sound from the Eastward, Watch Hill Lt. Ho. bearing N. N.W. distant 34 Miles.



New London Lt. Ho.

Noank Village

Bartlett's Reef Lt. Vessel

Hummock Lt.

South Hummock

Chocomaunt

Harv Rock

View of Approaches to Fisher's Id. Sound from the Westward, Race Rock bearing E. by S. $\frac{1}{2}$ S. distant 58 Miles.

DANGERS

IN APPROACHING, ENTERING AND PASSING THROUGH FISHER'S ISLAND SOUND BY THE MAIN CHANNEL.

I. From the Eastward, by the Watch Hill Passage.—On approaching Watch Hill Point from the eastward the channel will be seen to be marked on the northern side by a red spar-buoy and on the southern side by a black nun-buoy* and a spindle. The former is on Gangway Rock, a dangerous sunken rock, with two feet at low water, lying an eighth of a mile S. by **Gangway Rock**. W. from Watch Hill Light-house, with a narrow passage on its northern side through which fifteen feet at mean low water may be carried. The buoy, placed on the southeastern side of the rock in three and a half fathoms, is marked No. 2, and the sailing-line passes to the southward of it. From this buoy

	Miles.
Sugar Reef spindle bears W. $\frac{7}{8}$ S.-----	$\frac{7}{8}$
Napatree Point Ledge buoy W. by N. $\frac{1}{8}$ N.-----	1 $\frac{3}{8}$
West Spindle W. $\frac{1}{4}$ N.-----	nearly 2 $\frac{1}{4}$

The nun-buoy and spindle on the southern side of the channel mark Watch Hill Reef,—the dry part of which (upon which the spindle stands) lies eleven hundred and fifty yards SW. by S. Southerly from Watch Hill Light-house. Shoal water extends from the spindle E. by N. $\frac{3}{4}$ N. three hundred yards, at which point is placed the buoy,—a nun* of the second class, painted black and marked No. 1. This buoy is in three and a half fathoms, and bears S. by W. $\frac{7}{8}$ W. from Watch Hill Light-house, distant half a mile. The spindle is of iron surmounted by a square cage, and is near the western end of the reef,—being intended principally as a guide to Sugar Reef Passage. It bears from the red buoy on Gangway Rock SW. $\frac{1}{4}$ W., eight hundred and fifty yards, and from the spindle on Sugar Reef E. by S. $\frac{1}{4}$ S., eleven hundred yards distant.

Watch Hill Reef.

An eighteen feet shoal extends in a NE. by N. direction from near Watch Hill Reef to within five hundred yards of the point, leaving a passage fifty yards wide, with five fathoms water, between its southern end and the reef; but this passage is of course unfit for strangers. Vessels of light draught pay no attention to this eighteen feet shoal, but may safely pass one hundred and fifty yards to the northward of the buoy and two hundred yards to the northward of the spindle.

Large vessels, in standing to the northward on a wind, should not approach Napatree Beach nearer than six hundred and fifty yards; but a vessel of ten feet draught or less may safely come within two hundred and fifty yards until near Napatree Point.

When past the buoy on Gangway Rock and fairly in the channel, an iron spindle, painted black and surmounted by a cage, will be seen to the southward of the course, about three-quarters of a mile off, and bearing about W. by S. $\frac{1}{4}$ S. This is on Sugar Reef, which is composed of several rocks, bare at low water, and surrounded by shoals extending principally in a N. and S. direction. The shoal water extends from the spindle to the northward two hundred yards and to the southward three hundred and fifty yards,—leaving a passage nine hundred yards wide on its eastern side, called Sugar Reef Passage. The spindle is on the northeasternmost of the dry rocks and bears from

Sugar Reef.

Gangway Rock buoy, W. $\frac{7}{8}$ S.-----	$\frac{7}{8}$ mile.
Watch Hill Light-house, W SW.-----	nearly 1 mile.
The spindle on Watch Hill Reef, W. by N. $\frac{1}{4}$ N.-----	a little over 1100 yds.

From this spindle

	Miles.
Stonington Light-house bears NW. by N. $\frac{3}{4}$ N.-----	a little over 2 $\frac{1}{4}$
Red buoy on Napatree Point Ledge NW. Westerly-----	a little over $\frac{3}{8}$
West Spindle W. $\frac{7}{8}$ N.-----	1 $\frac{3}{8}$

In standing to the southward on a wind vessels of large draught should not approach Sugar Reef spindle nearer than two hundred and fifty yards, and in standing to the northward should go about as soon as Watch Hill Light-house bears E. $\frac{3}{8}$ S., which will avoid the shoals off Napatree Point.

When abreast of Sugar Reef, having the spindle bearing S., a red can-buoy* will be seen well to the northward of the course,—bearing about NW. by W. $\frac{1}{8}$ W. and half a mile off. This is on the southwestern end of Napatree Point Ledge, making off from that point in a SW. by W. direction for nearly four hundred yards with a depth of not more than five feet two hundred yards from the shore. The buoy is a can of the second class, marked No. 4, placed in three and a half fathoms, and bears from

Napatree Point Ledge.

	Miles.
Watch Hill Light-house, W. $\frac{3}{8}$ N.-----	nearly 1 $\frac{3}{8}$
The red buoy on Gangway Rock, W. by N. $\frac{1}{8}$ N.-----	1 $\frac{3}{8}$
The spindle on Sugar Reef, NW. Westerly-----	a little over $\frac{3}{8}$

From this buoy

	Miles.
Stonington Light-house bears N. by W. $\frac{1}{2}$ W.-----	1 $\frac{3}{4}$
The light-vessel on Eel Grass Ground W. by N. $\frac{1}{2}$ N.----- a little over	2 $\frac{1}{2}$
Latimer's Reef buoy W. by N. $\frac{1}{4}$ N.----- a little over	1 $\frac{5}{8}$
West Spindle W. by S. $\frac{1}{4}$ S.-----	$\frac{7}{8}$

When past this buoy the channel is clear to the northwestward to Stonington Entrance for vessels drawing seven feet or less,—the course being **N NW**.

Continuing the course to the westward you will soon see, on the southern side of the channel, about half a mile off, and bearing **W. by S. $\frac{1}{4}$ S.**, an iron spindle painted black. This is on Wicopesset Rock. Nearly half a mile to the southeastward of it will appear another painted red. This is called **East Spindle**, and marks a detached rock, with three feet at low water, on the eastern side of the entrance to Lord's Passage. It is not in the way of vessels using the Watch Hill Passage, which should not, in beating, stand to the southward of West Spindle bearing **W. by N.** East Spindle bears from West Spindle **SE.**, nine hundred and fifty yards distant.

Wicopesset Rock, upon which is built **West Spindle**, is a detached shoal, with four feet at low water, lying six hundred yards **E. $\frac{3}{8}$ N.** from Wicopesset Island and, consequently, on the southern side of this passage. Shoal water extends to the eastward from the spindle one hundred yards and to the westward nearly two hundred yards, leaving a narrow and unsafe passage, with seventeen feet at low water, between it and Wicopesset Island. The spindle is on the top of the rock and was formerly surmounted by a square cage, now gone. It bears from

	Miles.
Sugar Reef spindle, W. $\frac{7}{8}$ N. -----	1 $\frac{3}{8}$
Gangway Rock buoy, W. $\frac{1}{4}$ N. ----- nearly	2 $\frac{1}{4}$
Napatree Point Ledge buoy, W. by S. $\frac{1}{8}$ S. -----	$\frac{3}{8}$

From this spindle

	Miles.
Stonington Light-house bears N. by E.-----	1 $\frac{7}{8}$
The red buoy on The Middle Ground N. $\frac{1}{4}$ E. ----- about	$\frac{3}{4}$
The striped buoy on Latimer's Reef NW. $\frac{1}{2}$ W. ----- nearly	1
Latimer's Reef spindle NW. by W. -----	1 $\frac{1}{4}$
Eel Grass Light-vessel NW. by W. $\frac{1}{8}$ W. -----	1 $\frac{5}{8}$
The red buoy on the southern end of Ram Island Reef W. by N. $\frac{1}{2}$ N. ----- nearly	3

To avoid Wicopesset Rock, when standing to the southward on a wind, you must not bring Watch Hill Light-house to bear anything to the northward of **E**.

On coming abreast of West Spindle, having it bearing **S.**, a red can-buoy* will be seen abeam, bearing nearly due **N.** and about five-eighths of a mile off. This marks the southwestern extremity of the large flats extending from the shore between Napatree and Sandy points and known by the somewhat inappropriate name of The Middle Ground. Nine feet at low water is found in various places along the western edge of this shoal from seven-eighths of a mile to a mile from shore; and the buoy, which is marked No. 6, is placed in eighteen feet water, principally as a guide to Stonington Entrance. Vessels passing through the Sound pay no attention to it unless standing to the northward on a wind, in which case they should go about as soon as Watch Hill Light-house is brought in range with the southern end of Napatree Point on a bearing of **E. by S. $\frac{1}{4}$ S.** or Eel Grass Light-vessel bearing **W. by N.**

Wicopesset Reef is an extensive piece of shoal ground lying about **NW.** and **SE.** and surrounding the island of Wicopesset. Between the lines of three fathoms it extends northwest from the island a quarter of a mile; northeast five hundred and fifty yards; east two hundred and fifty yards; southeast nine hundred yards; and west one hundred and fifty yards. The passage between its eastern edge and Wicopesset Rock is two hundred yards wide and is good for seventeen feet at low water; while the Wicopesset Passage, on its western side, (between it and Fisher's Island,) is but a little over one hundred yards in width with a depth of three fathoms. The shoalest part of the reef, which has from one to six feet upon it, extends **NW.** from the island four hundred and fifty yards, and vessels should be careful, when in its vicinity, not to stand to the southward of Watch Hill Light-house bearing **E. $\frac{1}{4}$ S.**

Latimer's Reef is the name given to two detached reefs lying about three-quarters of a mile to the northward of East Point, with a passage between them having not less than three and a half fathoms. The easternmost, which has three feet at low water, lies about a mile **NW. $\frac{1}{2}$ W.** from the spindle on Wicopesset Rock; three-quarters of a mile **NW. by N.** from Wicopesset Island; and nearly seven-eighths of a mile **W. by S.** southerly from the red buoy on The Middle Ground. The spindle on the dry part of the reef bears from this shoal

W. $\frac{1}{2}$ N., about six hundred yards distant. A spar-buoy, painted red and black in horizontal stripes, is placed in fifteen feet close to the southeastern side of the ledge; and the sailing-line of the Main Channel passes about six hundred yards to the southward of it. The dry part of the reef is marked by an iron spindle painted red and black in horizontal stripes and surmounted by a square cage. From this spindle

	Miles.
Eel Grass Light-vessel bears NW. by W. $\frac{1}{2}$ W. nearly	$\frac{5}{8}$
The red buoy on the southern end of Ram Island Reef W. $\frac{1}{2}$ N. Northerly	1 $\frac{3}{4}$
Sea Flower Reef Beacon W. $\frac{1}{2}$ N.	4 $\frac{1}{2}$
North Hammock Light-house W. $\frac{3}{8}$ S. nearly	4
The northern end of East Clump W. by S. $\frac{1}{8}$ S. a little over	1 $\frac{1}{4}$

There is an excellent channel over half a mile wide between this spindle and Eel Grass Light-vessel, in which there is not less than four and three-quarter fathoms.

In beating to windward in the vicinity of Latimer's Reef do not stand to the northward of Watch Hill Light-house bearing E. $\frac{3}{4}$ S.

The Seal Rocks are a group of rocks bare at low water and surrounded by shoal ground, the southern extremity of which is about three hundred and fifty yards to the northwestward of East Point. Between the lines of three fathoms they cover a space about three hundred yards N. and S. by nearly six hundred E. and W., leaving a passage a hundred yards wide, with four fathoms at low water, between them and the rocky shoal on the northern side of East Point, locally known as the South Channel. A black spar-buoy (No. 3) is placed in fifteen feet on their northern side and will be seen, when abreast of Wicopesset Island, bearing W. $\frac{1}{4}$ S. and five-eighths of a mile distant. The sailing-line of the Main Channel passes an eighth of a mile to the northward of it.

Seal Rocks.

To avoid Seal Rocks vessels should not go to the southward of the northern end of East Clump bearing W. $\frac{3}{8}$ N. The black buoy on these rocks bears from

	Miles.
Napatree Point Ledge buoy, W. a little over	1 $\frac{3}{4}$
The spindle on Wicopesset Rock, W. by N. $\frac{1}{8}$ N. nearly	1
Wicopesset Island, W NW.	$\frac{5}{8}$
The striped buoy on Channel Rock, NW. $\frac{3}{4}$ W. a little over	1 $\frac{1}{2}$
East Point, NW. $\frac{3}{8}$ N. about	850 yds.

From this buoy

	Miles.
Latimer's Reef spindle bears N. by W. nearly	$\frac{1}{2}$
Eel Grass Light-vessel NW. $\frac{1}{2}$ N. Northerly nearly	1
The red buoy on the southern end of Ram Island Reef W. by N. $\frac{3}{4}$ N.	2
The northern end of East Clump W. $\frac{3}{4}$ N.	1 $\frac{3}{8}$
The black buoy on Young's Rock W. $\frac{1}{4}$ N.	900 yds.

The last-mentioned buoy is on the western side of that rock in fifteen feet at lowest tides, and will be seen, when abreast of Seal Rocks, bearing W. by S. $\frac{1}{4}$ S., distant nearly half a mile.

Young's Rock is a detached rock, bare at extreme low tides, lying about seven hundred yards to the eastward of Seal Rocks and about four hundred yards from the northern shore of Fisher's Island. The South Channel, which passes between it and the island, is at this point a little over two hundred yards wide and has four and a half fathoms.

Young's Rock.

The buoy is marked No. 5, placed in fifteen feet on the western side of the rock, and bears from

Seal Rocks buoy, W. $\frac{1}{4}$ N.	900 yds.
The striped buoy on the eastern end of Latimer's Reef, SW. by W. nearly	$\frac{3}{4}$ mile.
Latimer's Reef spindle, SW. by S. a little over	$\frac{1}{2}$ "

From this buoy

	Miles.
The northern end of East Clump bears W. $\frac{3}{4}$ N. nearly	1
Red buoy on S. end of Ram Island Reef NW. by W. $\frac{3}{4}$ W. about	1 $\frac{5}{8}$
Eel Grass Light-vessel N. by W. $\frac{1}{4}$ W.	$\frac{3}{4}$

Eel Grass Light-vessel marks a shoal with five feet at low water called the Eel Grass Ground. It extends NW. by N. and SE. by S., is about three hundred and fifty yards long within the six feet lines, and covers a space three-eighths of a mile in length and a quarter of a mile wide within the eighteen feet lines. A red buoy (No. 12) is placed on its northwestern side as a guide to the North Channel. The light-vessel is anchored in deep water about three hundred and fifty yards SE. by S. from the southern end of the shoal of the ledge. She is schooner-rigged, painted lead-color, has no day-mark, and shows a fixed white light

Eel Grass Ground.

(reflector) from a height of thirty-two feet above the sea, visible eleven miles. The words "Eel Grass" are painted in large letters on each side of the hull. During foggy weather a bell is rung regularly and a horn occasionally sounded.

Eel Grass Light-vessel bears from

	Miles.
Watch Hill Light-house, W. by N. $\frac{1}{4}$ N. -----	3 $\frac{7}{8}$
Red buoy on The Middle Ground, W. $\frac{3}{8}$ N. -----	1 $\frac{3}{8}$
Napatree Point Ledge buoy, W. by N. $\frac{1}{2}$ N. Northerly ----- a little over	2 $\frac{1}{2}$
Sugar Reef spindle, W NW. -----	3 $\frac{1}{8}$
The striped buoy on the eastern end of Latimer's Reef, NW. by W. $\frac{7}{8}$ W. ;	$\frac{7}{8}$
Latimer's Reef spindle, NW. by W. $\frac{1}{4}$ W. ----- nearly	$\frac{3}{8}$

This light-vessel marks the northern side of the Middle Channel, which is here about twelve hundred yards wide with not less than four and three-quarter fathoms. From this light-vessel

	Miles.
The southwestern end of Ram Island bears W. by N. $\frac{1}{8}$ N. -----	1 $\frac{3}{8}$
The spindle on Ram Island Reef W. $\frac{1}{4}$ N. ----- a little over	1 $\frac{1}{4}$
The red buoy on the southern end of Ram Island Reef W. $\frac{3}{8}$ S. -----	1 $\frac{1}{4}$
North Hammock Light-house W. by S. -----	3 $\frac{1}{2}$

Vessels passing through the Main Channel with a fair wind pay no attention to the Eel Grass Ground,—using the light-vessel only as a night-guide to show them their position. But if standing to the northward on a wind they should not, when between Latimer's Reef and Ram Island Reef, stand farther to the northward than to bring Morgan's Point Light-house to bear NW. by W. $\frac{3}{4}$ W. or Eel Grass Light-vessel E. by S. $\frac{1}{2}$ S. This will give them ample room to clear the Eel Grass Ground in going about.

Continuing the course to the westward through the Main Channel, after passing Young's Rock there will soon appear to the southward of the course, bearing about W. by S. $\frac{1}{4}$ S. and half a mile off, a low flat islet, called East Clump. Shoal water surrounds it,—extending to the northward about a hundred and twenty-five yards; to the southward fifty yards; and to the eastward seventy-five yards. To avoid it at night do not go to the southward of Watch Hill Light-house bearing E. $\frac{3}{8}$ S.

When abreast of East Clump, a red can-buoy* will be seen well to the northward of the course, bearing about NW. $\frac{1}{4}$ W., and five-eighths of a mile distant. This is on the southern end of Ram Island Reef, a detached reef, bare at low water and surrounded by shoals, which lies about six hundred and fifty yards SSE. from the middle of the southern part of Ram Island. Shoal water extends from the reef to the buoy, which is placed in eighteen feet water four hundred yards S. by E. $\frac{1}{4}$ E. from the shoalest part. It is a second-class can,* marked No. 14, and bears from

	Miles.
Red buoy on NW. side of Eel Grass Ground, SW. by W. $\frac{3}{4}$ W. -----	1
Eel Grass Light-vessel, W. $\frac{3}{8}$ S. -----	1 $\frac{1}{4}$
Latimer's Reef spindle, W. $\frac{1}{2}$ N. Northerly -----	1 $\frac{3}{4}$
Seal Rocks buoy, W. by N. $\frac{3}{4}$ N. ----- nearly	2
Young's Rock buoy, NW. by W. $\frac{7}{8}$ W. ----- nearly	1 $\frac{3}{8}$
Northern end of East Clump, NW. ----- nearly	$\frac{3}{4}$

From this buoy

	Miles.
Morgan's Point Light-house bears NW. by N. ----- nearly	1 $\frac{1}{8}$
The red spar-buoy on The Sweeper's Ground W. by N. $\frac{1}{8}$ N. ----- nearly	1
The spindle on Groton Long Point W. by N. $\frac{1}{4}$ N. ----- nearly	1 $\frac{1}{2}$
Sea-Flower Reef Beacon W. -----	2 $\frac{3}{4}$
North Hammock Light-house W. by S. $\frac{1}{4}$ S. -----	2 $\frac{1}{4}$
Middle of South Hammock W SW. -----	2 $\frac{1}{4}$
Highest part of Flat Hammock SW. by W. $\frac{3}{8}$ W. ----- a little over	2
West Clump SW. $\frac{7}{8}$ W. ----- a little over	1 $\frac{1}{8}$
Middle Clump SW. by S. $\frac{3}{4}$ S. -----	$\frac{3}{8}$

The dry part of Ram Island Reef is marked by an iron spindle painted red and surmounted by a square cage. It is near the northern end of the reef and about six hundred and fifty yards from the southern shore of Ram Island, between which and the spindle there is a narrow passage with five fathoms but unfit for strangers. Shoals with six feet in places upon them extend off four hundred yards from the southern shore of the island, and the reef extends one hundred yards to the northward from the spindle, so that the deep channel is only about a hundred yards wide and should not be attempted. Small vessels may pass over Ram Island Reef between the buoy and the spindle, where they will have about ten feet; but it is not advisable for a stranger to attempt this.

To avoid Ram Island Reef do not go farther to the northward than to bring Watch Hill Light-house to bear **E. $\frac{3}{4}$ S.**

On the southern side of the Main Channel, about three-quarters of a mile **W. $\frac{1}{2}$ S.** from East Clump, lie two low flat islets, connected at low water and known as **Middle Clump**. Shoal water extends from them to the eastward three hundred and fifty yards and to the southward the same distance; but they are comparatively bold-to on their northern side, and may be approached from that direction within one hundred yards with not less than four fathoms. The South Channel, which leads into West Harbor, passes to the southward of this clump and is here one hundred and seventy-five yards wide between the lines of three fathoms; but vessels drawing twelve feet have an unobstructed channel three hundred yards wide between Middle Clump and Hawk's Nest Point. To avoid Middle Clump, vessels beating through the Main Channel should not stand farther to the southward than to bring North Hammock Light-house to bear **W. $\frac{1}{2}$ S.**

When to the westward of Ram Island Reef buoy vessels should go about, when standing to the northward, as soon as Eel Grass Light-vessel bears **E. $\frac{1}{4}$ S.**, (with Ram Island spindle in range,) in order to avoid The Sweeper's Ground, an eight feet shoal, about half a mile to the westward of the southwestern end of Ram Island and off the mouth of the Mystic River. It is marked by a red spar-buoy (No. 16) placed in two fathoms on its southwestern end, marking also the eastern side of the entrance to Mystic River. All the ground between Ram Island and Groton Long Point is shoal,—the greatest depth being fourteen feet,—and it is not safe for vessels to go to the northward of Eel Grass Light-vessel bearing **E. $\frac{1}{4}$ S.**, as above, without a pilot.

The Sweeper's Ground.

The red buoy on The Sweeper's Ground bears from

	Mile.
Ram Island Reef buoy, W. by N. $\frac{1}{2}$ N. -----	nearly 1
Ram Island spindle, W. by N. -----	nearly $\frac{1}{2}$
The southwestern end of Ram Island, W. by S. $\frac{1}{2}$ S. -----	a little over $\frac{1}{2}$

From this buoy

Morgan's Point Light-house bears N NE. -----	$\frac{5}{8}$ mile.
The spindle on Groton Long Point W. $\frac{1}{4}$ N. -----	about 1100 yds.
Sea-Flower Reef Beacon W. $\frac{3}{4}$ S. Southerly -----	1 $\frac{7}{8}$ miles.
North Hammock Light-house SW. by W. -----	1 $\frac{5}{8}$ miles.

From Groton Long Point there extends to the southward a reef of rocks about two hundred yards long and dry at low water, called Groton Long Point Reef. On the extremity of this will be seen, when in the vicinity of the point, a red spindle surmounted by a cage in the form of an inverted cone. It stands upon a large boulder at the southern extremity of the reef and may be approached within one hundred and twenty-five yards by vessels drawing fourteen feet. It is safest, however, to give it a berth to the northward of not less than three hundred yards. This spindle bears from

Groton Long Point Reef.

	Miles.
Morgan's Point Light-house, SW. by W. -----	nearly 1
The buoy on The Sweeper's Ground, W. $\frac{1}{4}$ N. -----	over $\frac{1}{2}$
Ram Island spindle, W. $\frac{3}{8}$ N. -----	1 $\frac{3}{8}$
Ram Island Reef buoy, W. by N. $\frac{3}{8}$ N. -----	nearly 1 $\frac{1}{2}$
The northern end of East Clump, NW. by W. $\frac{3}{4}$ W. -----	nearly 2 $\frac{1}{4}$
Middle Clump, NW. $\frac{3}{8}$ W. -----	1 $\frac{1}{2}$

From it

	Miles.
The red buoy on the southern end of Horse-Shoe Reef bears W. by N. Northerly -----	$\frac{7}{8}$
Sea-Flower Reef Beacon W. by S. $\frac{1}{4}$ S. -----	1 $\frac{3}{8}$
North Hammock Light-house SW. $\frac{1}{2}$ S. -----	nearly 1 $\frac{1}{4}$

On the southern side of the channel, about fourteen hundred yards **W. $\frac{3}{4}$ S.** from Middle Clump, lies the low flat islet called **West Clump**. It is comparatively bold-to on its northern side and may be safely approached within one hundred and fifty yards with five fathoms water; but on its southern side the shoal water, which connects all these islets in one reef, extends to the southward three hundred and fifty yards,—the space between its southern side and Clay Point being occupied by the South Channel, which is here an eighth of a mile wide and has six fathoms.

At night, to avoid West Clump, do not go to the southward of North Hammock Light-house bearing **W.**

Flat Hammock, which, as before mentioned, lies off the entrance to West Harbor, is about fourteen hundred yards **W. $\frac{1}{4}$ S.** from West Clump, and like it is surrounded by shoal water. On its northern side it should not be approached by vessels of greater draught than seven feet nearer than

two hundred and fifty yards, as a long spit, dry at low water, makes off in a northeasterly direction from the islet. Soundings on the shoals surrounding Flat Hammock are very irregular and the safest plan is to give the island a good berth.

North Hammock is also surrounded by shoal water. Vessels passing to the northward of it should not approach nearer than a hundred and fifty yards, while those passing to the southward should give it a berth to the westward of three hundred and fifty yards and to the northward of not less than two hundred yards. The channel between it and South Hammock is over three hundred yards wide with not less than four fathoms.

Vessels standing to the northward on a wind should be careful, when to the westward of the spindle on Groton Long Point Reef, not to go to the northward of Eel Grass Light-vessel bearing E. $\frac{1}{4}$ S., as there is a dangerous reef about three-eighths of a mile W. by N. from the spindle and three hundred yards from shore. It is about two hundred yards in diameter and bare at low spring tides.

Off the middle of the entrance to Mumford's Cove and seven-eighths of a mile to the westward of Groton Long Point lies the dangerous Horse-Shoe Reef, three hundred yards long in a NNE. and SSW. direction, and bare in places at low spring tides. On its southern extremity is placed a red spar-buoy (No. 18) in four fathoms water, which will be seen when abreast of North Hammock bearing about NW. by N. $\frac{1}{2}$ N. and a little over half a mile off. It bears from

Horse-Shoe Reef.

The spindle on Groton Long Point Reef, W. by N. Northerly	Miles.
Bluff or Mumford's Point, S. by E. $\frac{1}{4}$ E.	$\frac{7}{8}$
North Hammock Light-house, N. $\frac{1}{2}$ W.	1 $\frac{1}{8}$

From it the beacon on Sea-Flower Reef bears SW. $\frac{1}{2}$ S., nearly three-quarters of a mile, and Bartlett's Reef Light-vessel W. by S. $\frac{1}{2}$ S., five miles and an eighth distant.

Horse-Shoe Reef is not in the way of vessels passing through the Sound unless they are standing to the northward on a wind, in which case they should go about as soon as Eel Grass Light-vessel bears E. $\frac{1}{2}$ S.

Sea-Flower Reef, or Potter's Reef as it is sometimes called, is a dangerous reef lying almost exactly in the middle of the western entrance to Fisher's Island Sound,—being a mile to the southward of Mumford's Point and about a mile and a quarter to the northward of Northwest Point. There is equally good water on all sides of this reef, but the usual channel passes to the southward of it,—that to the northward being known as the Pine

Sea-Flower Reef.

Island Channel, and used only by vessels bound to and from New London. The reef is easily recognizable, as it is surmounted by a large granite beacon supporting a spindle and cage, placed near the western side of the reef. This beacon, called Sea-Flower Reef Beacon, should not be approached from the northward nearer than two hundred yards nor from the eastward or southward nearer than three hundred yards. It bears from

Eel Grass Light-vessel, W. $\frac{1}{2}$ S.	Miles.
Ram Island spindle, W. $\frac{1}{4}$ S. nearly	4
The red buoy on the southern end of Ram Island Reef, W.	2 $\frac{3}{4}$
The northern end of East Clump, W. $\frac{7}{8}$ N.	2 $\frac{1}{4}$
Groton Long Point spindle, W. by S. $\frac{1}{4}$ S.	3 $\frac{1}{4}$
The red buoy on the southern end of the Horse-Shoe, SW. $\frac{1}{2}$ S. nearly	1 $\frac{3}{4}$
North Hammock Light-house, NW. Northerly	over $\frac{3}{4}$

From this beacon Bartlett's Reef Light-vessel bears W. by S. $\frac{1}{4}$ S., four miles and five-eighths, and Race Rock Light-house S. by W. $\frac{3}{4}$ W., a little over three miles and an eighth distant.

Sea-Flower Reef is the last of the dangers met with in passing through Fisher's Island Sound bound to the westward, but vessels from Gardiner's Bay, or those which pass to the southward of North Hammock and steer towards Race Rock, must beware of Northwest Point Reef, a very dangerous rocky reef which makes off from Northwest Point in a nearly N. direction for between five and six hundred yards. It has from two to four feet upon it and many bare boulders, and is marked by a black spar-buoy (No. 7) placed in ten feet water on its northern end. This buoy bears from

Northwest Point Reef.

The northern end of South Hammock, SW. by W. $\frac{1}{2}$ W.	550 yds.
North Hammock Light-house, SSW.	$\frac{1}{4}$ mile.
Sea-Flower Reef Beacon, S. by E. $\frac{3}{4}$ E.	1 "
The summit of North Hill, N. by E. $\frac{5}{8}$ E.	3 "
	a little over
	a little over

From this buoy Race Rock Light-house bears SW. $\frac{3}{4}$ S., two miles and three-eighths, and Bartlett's Reef Light-vessel W., four miles and three-quarters distant.

SAILING DIRECTIONS

FOR APPROACHING, ENTERING AND PASSING THROUGH FISHER'S ISLAND SOUND BY THE MAIN CHANNEL.

I. From the Eastward, by the Watch Hill Passage.—From off Point Judith the course for Watch Hill Passage is **W.** and the distance seventeen miles and a quarter. On this course, when up with the red buoy on Gangway Rock, in four and three-quarter fathoms, steer **W. $\frac{3}{4}$ N.**, which course will lead, with not less than five fathoms, through the Main Channel of the Sound. When about a mile to the westward of Ram Island Reef buoy, in ten fathoms, with Morgan's Point Light-house bearing **N.** by **E. $\frac{3}{8}$ E.**, one mile, and Bartlett's Reef Light-vessel **W. $\frac{3}{4}$ S.**, steer for the latter—which course will lead, with not less than five and a half fathoms, into Long Island Sound, and with not less than four and a quarter fathoms to abreast of Bartlett's Reef Light-vessel.

The above courses pass about forty yards to the southward of the red buoy on Gangway Rock; five hundred and fifty yards to the northward of the black buoy on Watch Hill Reef; six hundred yards to the northward of Watch Hill Reef spindle; a quarter of a mile to the northward of Sugar Reef spindle; nine hundred yards to the northward of Catumb Rock; three hundred yards to the southward of Napatree Point Ledge buoy; nearly half a mile to the northward of East Spindle; four hundred yards to the northward of West Spindle, (on Wicopesset Rock;) two hundred yards to the northward of the northern end of Wicopesset Reef; six hundred yards to the southward of the striped buoy on the eastern end of Latimer's Reef; an eighth of a mile to the northward of the black buoy on Seal Rocks; six hundred yards to the southward of Latimer's Reef spindle; nearly four hundred yards to the northward of the black buoy on Young's Rock; eleven hundred yards to the southward of Eel Grass Light-vessel; three hundred yards to the northward of East Clump; a quarter of a mile to the southward of Ram Island Reef buoy; seven hundred yards to the northward of Middle Clump; nine hundred and fifty yards to the southward of the red buoy on The Sweeper's Ground; eleven hundred yards to the northward of West Clump; four hundred yards to the northward of North Hammock Light-house; nine hundred yards to the southward of Sea-Flower Reef Beacon; and five-eighths of a mile to the northward of the black buoy on Northwest Point Reef.

*Or, the **W. $\frac{3}{4}$ N.** course may be continued,* passing to the northward of Sea-Flower Reef, and when abreast of the beacon, having it bearing **S. $\frac{3}{4}$ E.**, about two hundred and fifty yards off, steer **W.** by **S. $\frac{1}{4}$ S.**, which will lead, with not less than six fathoms, into Long Island Sound and up with Bartlett's Reef Light-vessel. Hence, the course through Long Island Sound will be **W. $\frac{3}{4}$ S.**, following the directions given for that thoroughfare.

The above course through Fisher's Island Sound passes nine hundred yards to the southward of the spindle on Groton Long Point Reef; nine hundred and fifty yards to the southward of Horse-Shoe Reef buoy; and about two hundred and fifty yards to the northward of the beacon on Sea-Flower Reef.

Or, at night-time to come into Fisher's Island Sound from the vicinity of Block Island or Montauk Point, keep Watch Hill light on a bearing of **N.** by **W.** and steer boldly in towards the beach until the red light on North Hammock opens from behind Fisher's Island on a bearing of **W. $\frac{1}{4}$ N.** Now steer **W. $\frac{3}{4}$ N.**, which will lead safely through the Main Channel between the spindle on Latimer's Reef and the buoy on Young's Rock.

On the above courses, to enter Stonington Harbor.—On the **W. $\frac{3}{4}$ N.** course, when Stonington Light-house bears **N. $\frac{1}{4}$ W.** and West Spindle **W.** by **S. $\frac{1}{4}$ S.** Southerly, the depth will be ten and three-quarter fathoms, soft bottom, and the course **NW. $\frac{3}{4}$ N.** (carrying not less than five fathoms) for nearly a mile, or until Stonington Light-house bears **NE.** by **N. $\frac{3}{4}$ N.** and Eel Grass Light-vessel **W. $\frac{1}{4}$ N.**, when the depth will be five fathoms and **N.** by **E. $\frac{1}{4}$ E.** will lead, with not less than thirteen feet, up to the breakwater.

The above courses pass one hundred yards to the westward of the red buoy off the southern end of The Middle Ground; an eighth of a mile to the westward of the western edge of that shoal; half a mile to the westward of the red buoy on Bartlett's Reef; the same distance to the eastward of the red buoy on Noyes' Rocks; and four hundred and fifty yards to the westward of the black buoy off Windmill Point.

Sailing Direc- *On the above courses, to enter East Harbor.*—On the W. $\frac{3}{4}$ N. course through *tions--Fisher's Island Sound.* the Sound, when Eel Grass Light-vessel bears N. $\frac{1}{2}$ W. and North Hammock Light-house W. $\frac{1}{8}$ S., with a depth of ten fathoms, steer SW. by S., which course will lead straight into the harbor, where anchorage may be found in fourteen feet. In heavy weather from the northeastward vessels of light draught may, when the eastern point of entrance to the harbor bears NE. by E. $\frac{1}{2}$ E., steer SE. $\frac{3}{8}$ E., and anchor near the head of the harbor in from seven to eleven feet at low water.

On the above courses, to enter Mystic River.—When Morgan's Point Light-house bears N. by E. $\frac{3}{8}$ E., in ten fathoms, steer N., which will bring you, with not less than three and a half fathoms, abreast of the red buoy on The Sweeper's Ground. When past this buoy, in about fourteen feet, with Eel Grass Light-vessel bearing E. $\frac{1}{2}$ S. Southerly and the spindle on Groton Long Point Reef W. $\frac{1}{8}$ S., nine hundred yards distant, NE. $\frac{1}{2}$ N. will lead, with not less than ten feet, up with the spindle on Whale Rock; after which the directions for the river must be followed.

Vessels of light draught may, when the red buoy on the southern end of Ram Island Reef bears NE. by N. $\frac{3}{4}$ N., in twelve fathoms, steer NW. $\frac{3}{4}$ N., which will bring them up with the perpendicular striped buoy to the westward of Ram Island Flats. When up with this buoy and Morgan's Point Light-house bears N NE., they should steer N NE. Easterly, which will bring them up with the spindle on Whale Rock; after which the directions for the river must be followed.

On the above courses, to enter West Harbor.—On the W. $\frac{3}{4}$ N. course through the Sound, when past Young's Rock and Eel Grass Light-vessel bears N. $\frac{1}{8}$ E., the depth will be eight fathoms, and the course W. by S. $\frac{1}{4}$ S. will lead through the South Channel, with not less than three and a half fathoms, between Hawk's Nest Point and Middle Clump and past Clay Point. On this course, when Morgan's Point Light-house bears N. by E. $\frac{1}{2}$ E., with a depth of four and a half fathoms, SW. $\frac{3}{4}$ S. will lead, with not less than twelve feet, to the anchorage in West Harbor.

Vessels of six feet draught may, cross the shoal ground between Middle Clump and West Clump with the following directions: When the red buoy on the southern end of Ram Island Reef bears NE. by N. $\frac{3}{4}$ N. the depth will be eleven fathoms, and SW. $\frac{3}{4}$ W. will cross the reef in ten feet water. When Morgan's Point Light-house bears N. by E. $\frac{1}{2}$ E., as before, in four and a half fathoms, SW. $\frac{1}{2}$ S. will lead to the anchorage.

On the above courses, to enter New London Harbor by the Pine Island Channel.—When, on the W. $\frac{3}{4}$ N. course through the Sound, the beacon on Sea-Flower Reef bears W. by S. $\frac{1}{2}$ S., six hundred and fifty yards distant, and New London Light-house NW. by W. $\frac{1}{2}$ W., a little over three miles distant, steer for the light-house, which course will lead, with not less than three fathoms, to the entrance; after which the directions given for the harbor must be followed.

DANGERS

IN APPROACHING, ENTERING AND PASSING THROUGH FISHER'S ISLAND SOUND BY THE MAIN CHANNEL.

2. *From the Eastward, by the Sugar Reef Passage.*—This channel is not recommended to strangers, as the set of the tidal current is directly across its course with a velocity of over one mile an hour. It has, however, deep water (not less than twenty-three feet) and is about nine hundred yards wide; so that steamers, or even sailing vessels with a fair wind, may use it in daytime, when the spindles marking the entrance can be seen.

On approaching the passage from the eastward the spindle on Watch Hill Reef will be seen a little to the northward of the course, bearing about N. by W. $\frac{1}{4}$ W. and five-eighths of a mile off. It is built upon the dry part of the reef (which lies near its southwestern end) and will appear as an iron spindle painted black and surmounted by a square cage. An eighth of a mile to the eastward of it will be seen the black nun-buoy* (No. 1) placed on the eastern end of the reef; and vessels drawing twelve feet or less may cross the reef between the buoy and the spindle by keeping nearest to the former. It is safest, however, to keep to the regular channels.

Watch Hill Reef spindle bears from

Watch Hill Light-house, SW. by S. Southerly-----	Yards.
Sugar Reef spindle, E. by S. $\frac{1}{4}$ S.-----	1150
The black nun-buoy on the eastern end of the reef, W. by S. $\frac{1}{4}$ S.---about	1100
	300

From this spindle Napatree Point Ledge buoy bears NW. by W. $\frac{1}{4}$ W., a little over a mile and an eighth distant.

When the spindle on Watch Hill Reef is first seen on the eastern side of the entrance there will appear on the western side another black spindle, surmounted by a cone-shaped cage and bearing NW. $\frac{1}{4}$ N., about a mile distant. This is on Sugar Reef, an extensive piece of shoal ground, composed of several rocks bare at low water, and surrounded by broken ground *Sugar Reef.* extending principally in a N. and S. direction. Shoal water extends to the northward two hundred yards, to the southward three hundred and fifty yards, and to the eastward one hundred and fifty yards from the spindle; and vessels using this channel must give it a berth to the westward of not less than an eighth of a mile. This spindle is on the northeasternmost of the dry rocks and bears from

	Miles.
Watch Hill Light-house, W SW. -----	nearly 1
Stonington Light-house, SE. by S. $\frac{3}{4}$ S. -----	a little over 2 $\frac{1}{4}$
The red buoy on Napatree Point Ledge, SE. Easterly -----	a little over $\frac{3}{8}$
Watch Hill Reef spindle, W. by N. $\frac{1}{4}$ N. -----	a little over 1100 yds.

When past the spindle on Sugar Reef you are in the Main Channel, for description of dangers in which see pages 315-320.

SAILING DIRECTIONS

FOR APPROACHING, ENTERING AND PASSING THROUGH FISHER'S ISLAND SOUND BY THE MAIN CHANNEL.

2. *From the Eastward, by the Sugar Reef Passage.*—Bring Watch Hill Light-house to bear N. $\frac{3}{4}$ E., a little over a mile distant, and Eel Grass Light-vessel NW. by W. $\frac{1}{2}$ W., a little over four miles distant, when the depth will be seventeen fathoms, "white sand and black specks;" and NW. by N. $\frac{1}{4}$ N. will lead, with not less than five fathoms, through the passage and into the Main Channel. On this course, when in five fathoms, Dumpling Rock Light-house bearing W. $\frac{1}{4}$ N., six miles and a half distant, and Eel Grass Light-vessel W. by N. $\frac{3}{4}$ N., nearly three miles and a quarter distant, W. $\frac{1}{4}$ N. will lead safely through the Main Channel; after which follow the directions given on pages 321-322. Or, you may steer W. by N. $\frac{3}{4}$ N. for Eel Grass Light-vessel, which will lead safely into the Middle Channel with not less than five fathoms.

The current of flood sets to the westward and that of the ebb to the eastward. Therefore, in coming through this channel on the flood-tide keep nearest to Watch Hill Reef, and on the ebb nearest to Sugar Reef.

The above are all of the directions that can be given for this channel.

DANGERS

IN APPROACHING, ENTERING AND PASSING THROUGH FISHER'S ISLAND SOUND BY THE MAIN CHANNEL.

3. *From the Eastward, by the Catumb Passage.*—This channel, as before mentioned, lies between Sugar Reef on the east and Catumb Rocks on the west, has a depth of five fathoms and a width of five hundred yards. It is not recommended to strangers on account of the set of the tidal current, which is directly across the channel; but as circumstances may arise rendering it necessary to attempt its passage, a description of its dangers and directions to avoid them will be given.

The channel is clear between the two reefs,—it being only necessary to keep the middle in order to avoid them; and the courses given must, therefore, depend mainly upon the time of tide,—that is, during flood-tide vessels should keep the eastern side of the channel aboard, and during ebb tide the western side.

In approaching this channel from the southeastward the first danger met with is known as Catumb Rocks, and is formed by a number of rocks bare at low water, and surrounded by shoals extending over a surface about two hundred yards square. In 1874 there was *Catumb Rocks*, a spindle upon this ledge; but since that time it has been reported carried away. But in order to avoid the reef vessels should not go to the westward of Stonington Light-house bearing N. by W. $\frac{1}{2}$ W.

Sugar Reef, on the eastern side of the channel, has been already described on page 315 and above, and the spindle on its northwestern end is an excellent guide. It bears from Watch Hill Light-house WSW., nearly one mile, and from Stonington Light-house SE. by S. $\frac{3}{4}$ S., a little over two and a quarter miles distant. From this spindle West Spindle bears W. $\frac{3}{4}$ N., a mile and three-eighths distant, and Eel Grass Light-vessel WNW., the same distance.

When past Sugar Reef you are in the Main Channel,—the dangers in and the sailing directions for which will be found on pages 315-322.

SAILING DIRECTIONS

FOR APPROACHING, ENTERING AND PASSING THROUGH FISHER'S ISLAND SOUND BY THE MAIN CHANNEL.

3. *From the Eastward, by the Catumb Passage.*—If the tide be flood, bring Stonington Light-house to bear N. by W. $\frac{7}{8}$ W. and steer for it, carrying not less than four and a half fathoms, until North Hammock Light-house bears W. $\frac{1}{4}$ N., six miles and an eighth distant, and Eel Grass Light-vessel W. by N. $\frac{3}{4}$ N., nearly two miles and seven-eighths distant. The depth will be five and a half fathoms, and W. $\frac{3}{4}$ N. will lead through the Main Channel, following the directions given on page 321. To keep the bearing of Stonington Light-house it should be just open to the westward of Napatree Point.

Or, you may bring Watch Hill Light-house to bear N. $\frac{7}{8}$ E., a mile and a quarter distant, and Chocomount W. $\frac{3}{4}$ N., in about eighteen fathoms, and steer NW., which will lead safely into the Main Channel; and when Stonington Light-house bears N. by W. Westerly and Eel Grass Light-vessel W. by N. $\frac{7}{8}$ N., steer W. $\frac{3}{4}$ N. through the Sound, as before.

The first of the above courses gives Sugar Reef spindle a berth of over two hundred yards to the eastward and Catumb Rocks a berth of a quarter of a mile to the westward. The NW. course gives Sugar Reef spindle a berth of three hundred and fifty yards to the northeastward and leaves Catumb Rocks the same distance to the southwestward.

If the tide is slack you may bring Stonington Light-house to bear N. by W. $\frac{5}{8}$ W. and steer for it, which will lead, with not less than five fathoms, into the Main Channel. On this course, when in six fathoms, with Eel Grass Light-vessel bearing W. by N. $\frac{3}{4}$ N., steer W. $\frac{3}{4}$ N., which will lead safely through the Main Channel. The course for Stonington Light-house passes two hundred yards to the eastward of Catumb Rocks and a quarter of a mile to the westward of Sugar Reef spindle.

If the tide be ebb, bring Stonington Light-house to bear N. by W. $\frac{1}{2}$ W. and steer for it, which will lead safely into the Main Channel with not less than five fathoms. When Eel Grass Light-vessel bears W. by N. $\frac{3}{4}$ N., as before, W. $\frac{3}{4}$ N. will lead safely through the Sound.

DANGERS

IN APPROACHING, ENTERING AND PASSING THROUGH FISHER'S ISLAND SOUND BY THE MAIN CHANNEL.

4. *From the Eastward, by Lord's Passage.*—This passage is used principally by vessels bound to Stonington whether they come from the eastward or westward. As before mentioned, (page 314.) it leads between East Spindle on the east and Wicopesset Reef on the west, and is two hundred and fifty yards wide at its narrowest part with a depth of not less than three and a half fathoms at low water.

East Spindle, which guards the eastern side of the entrance to this channel, is built upon a detached ledge with three feet at low water, and surrounded by broken ground extending to the north-westward over three hundred yards and to the southeastward two hundred yards. The spindle is painted red and bears from

	Miles.
Stonington Light-house, S. Easterly..... a little over	2 $\frac{1}{4}$
Watch Hill Light-house, W. by S. $\frac{1}{2}$ S.	1 $\frac{7}{8}$
Sugar Reef spindle, W. $\frac{3}{4}$ S.	1

From this spindle Wicopesset Island bears W NW., fourteen hundred yards, and West Spindle NW., nine hundred and fifty yards distant.

Wicopesset Reef,—the shoal water of which forms the western boundary of Lord's Passage,—is an extensive piece of shoal ground lying about NW. and SE. and surrounding the island of Wicopesset.

Wicopesset Reef. Between the lines of three fathoms shoal water extends from the island to the north-eastward five hundred and fifty yards, to the eastward two hundred and fifty yards, and to the southeastward nine hundred yards; but there is good water in the last-named direction for vessels drawing ten feet or less within three hundred and fifty yards of the island. There is no buoy on the reef, which makes it dangerous for large vessels to approach; but its eastern end may be avoided by not going to the westward of Stonington Light-house bearing N. $\frac{5}{8}$ E. As, however, vessels bound to Stonington do not draw over fourteen feet at farthest, the available channel at this point is somewhat wider than the limits given by the lines of three fathoms. Such vessels may safely cross the southeastern end of the reef in from fifteen to seventeen feet at low water.

When abreast of East Spindle a black spindle will be seen well to the westward of the course, bearing NW. by N. $\frac{3}{4}$ N. and about three-eighths of a mile off. This is West Spindle, on Wicopesset Rock, and marks the western boundary of Lord's Passage. Wicopesset Rock is a detached shoal, with four feet at low water, lying six hundred yards E. $\frac{3}{8}$ N. from Wicopesset Island and on the western side of this channel. Shoal water extends from the spindle to the eastward one hundred yards and to the westward nearly two hundred yards, leaving a narrow and unsafe channel, with seventeen feet at low water, between the rock and Wicopesset Island. The spindle is on top of the rock and was formerly surmounted by a square cage, now gone. It bears from

*Wicopesset
Rock.*

Sugar Reef spindle, W. $\frac{1}{8}$ N. -----	Miles.
East Spindle, NW. -----	1 $\frac{3}{8}$
Napatree Point Ledge buoy, W. by S. $\frac{1}{8}$ S. -----	nearly $\frac{1}{2}$
	$\frac{1}{8}$

From the spindle Stonington Light-house bears N. by E., one mile and seven-eighths, and the red buoy on The Middle Ground N. $\frac{1}{4}$ E., about three-quarters of a mile distant.

When past Wicopesset rock you are in the Main Channel; and, if bound to the westward, must, when North Hammock Light-house bears W. $\frac{1}{8}$ N., steer W. $\frac{3}{4}$ N. through the Sound.

If bound to Stonington: The course leads to the northwestward, and a red can-buoy* will soon appear a little to the eastward of the course, bearing nearly N. This marks the southwestern extremity of the large flats extending from the shore between Napatree and Sandy points and known as The Middle Ground. Nine feet at low water is found in various places along the western edge of this shoal from seven-eighths of a mile to a mile from shore; and the buoy, which is marked No. 6, is placed in eighteen feet at low water, principally as a guide to Stonington Harbor. From this buoy Stonington Light-house bears N. by E. $\frac{1}{2}$ E., a mile and an eighth distant.

*The Middle
Ground.*

SAILING DIRECTIONS

FOR APPROACHING, ENTERING AND PASSING THROUGH FISHER'S ISLAND SOUND BY THE MAIN CHANNEL.

4. *From the Eastward, by Lord's Passage.*—Bring Stonington Light-house to bear N. $\frac{1}{2}$ E., three miles and an eighth distant, with sixteen fathoms water, and steer for it, which will lead, with not less than three and a half fathoms, into the Main Channel. On this course, when North Hammock Light-house bears W. $\frac{1}{8}$ N. and Eel Grass Light-vessel NW. by W. $\frac{3}{4}$ W., you will have ten fathoms and must steer W. $\frac{3}{4}$ N. to pass through the Sound. The N. $\frac{1}{2}$ E. course passes three hundred yards to the westward of East Spindle; one hundred and fifty yards to the eastward of the eastern extremity of Wicopesset Reef; and four hundred yards to the eastward of West Spindle, on Wicopesset Rock.

As the set of the tidal current is diagonally across this channel and reaches a velocity of two miles an hour, you should catch a range with the light-house to avoid being set on to the shoals on either side. A good mark is the large hotel in the northern part of Stonington, which will appear nearly in range with the light-house but open a very little to the westward of it.

On the above courses, to enter Stonington Harbor.—When, on the N. $\frac{1}{2}$ E. course, North Hammock Light-house bears W. $\frac{1}{8}$ N. and Eel Grass Light-vessel NW. by W. $\frac{3}{4}$ W., as before, steer N NW., which will lead, with not less than nine fathoms, to abreast of the red buoy on The Middle Ground. Passing this buoy the course should be continued about three hundred yards farther, until Stonington Light-house bears NE. by N. $\frac{3}{4}$ N. and Eel Grass Light-vessel W. $\frac{1}{4}$ N. The depth here will be about five fathoms and the course N. by E. $\frac{1}{4}$ E., following the directions given for the harbor.

DANGERS

IN APPROACHING, ENTERING AND PASSING THROUGH FISHER'S ISLAND SOUND BY THE MAIN CHANNEL.

5. *From the Eastward, by the Wicopesset Passage.*—As mentioned on page 314 this channel leads between Wicopesset Island and East Point, and, though narrow, is good for sixteen feet at low water. The set of the tidal current being nearly in the direction of the channel there is little difficulty in passing through at all times of tide, especially if the spindle on Latimer's Reef can be seen. This channel is obstructed by Wicopesset Reef on the east and Channel Rock on the west, between which it is not less than one hundred and fifty yards wide.

Wicopesset Reef, already described on pages 316 and 324, is an extensive piece of shoal ground lying about NW. and SE. and surrounding the island of Wicopesset. Between the lines of three fathoms the shoal water extends to the southeastward nine hundred yards, to the southward one hundred and fifty yards, to the westward one hundred and seventy-five yards, and to the northwestward a little over a quarter of a mile. It is not buoyed, but is easily avoided by vessels using this channel if they keep nearest to Channel Rock buoy and do not approach the island of Wicopesset nearer than two hundred yards.

Channel Rock, on the western side of the passage, is a small detached rock with four feet at low tides, lying three hundred and fifty yards E. $\frac{1}{4}$ S. from East Point. There is no passage inshore of it. A nun-buoy* of the third class, painted red and black in horizontal stripes, is placed on its northeastern side in ten feet water, and bears from East Spindle W. by N. $\frac{1}{4}$ N., nearly seven-eighths of a mile, and from the centre of Wicopesset SE. by E. $\frac{3}{4}$ E., a little over three hundred yards distant. From this buoy

	Miles.
Watch Hill Light-house bears E. $\frac{1}{2}$ N.	2 $\frac{3}{4}$
The red buoy on The Middle Ground NE. by N. $\frac{3}{8}$ N. a little over	1
Stonington Light-house NNE. Easterly	2 $\frac{1}{8}$
Latimer's Reef buoy N. by W. $\frac{3}{4}$ W. a little over	$\frac{3}{4}$
Latimer's Reef spindle NW. by N.	1
Eel Grass Light-vessel NW. Northerly	1 $\frac{1}{2}$
The black buoy on Seal Rocks NW. $\frac{3}{4}$ W. a little over	$\frac{1}{2}$

When past the northwestern end of Wicopesset Reef you are in the Main Channel, with Latimer's Reef to the northward and Seal Rocks to the southwestward,—both of which, together with the other dangers in the Main Channel, have already been described on pages 316–320.

SAILING DIRECTIONS

FOR APPROACHING, ENTERING AND PASSING THROUGH FISHER'S ISLAND SOUND BY THE MAIN CHANNEL.

5. *From the Eastward, by the Wicopesset Passage.*—Bring Stonington Light-house to bear N. $\frac{1}{2}$ E., about two miles and five-eighths distant, and Watch Hill Light-house NE. by E. $\frac{3}{4}$ E., two miles and a quarter distant, when the depth will be nine fathoms; and if the day be clear the spindle on Latimer's Reef will be seen bearing NW. $\frac{3}{8}$ N. and open a little to the southward of the summit of the wooded hill on Mason's Island. Steer in on this range, carrying not less than sixteen feet at low water, until through the passage and in the Main Channel, with Watch Hill Light-house bearing E. $\frac{1}{4}$ S., Stonington Light-house NE. $\frac{3}{8}$ N., North Hammock Light-house W., and the middle of East Clump W. $\frac{1}{8}$ N.,—the light-house being seen about midway between Middle and East clumps. Here the depth will be nine and a quarter fathoms, soft bottom, and W. $\frac{3}{4}$ N. will lead through the Sound, following the directions given on page 321.

The above courses pass nearly four hundred yards to the southwestward of the southeastern extremity of Wicopesset Reef; one hundred yards to the eastward of the striped buoy on Channel Rock; two hundred yards to the westward of Wicopesset Island; two hundred and fifty yards to the westward of the northwestern end of Wicopesset Reef; and four hundred yards to the eastward of Seal Rocks.

DANGERS

IN PASSING THROUGH FISHER'S ISLAND SOUND BY THE NORTH CHANNEL.

II. *From Stonington.*—This channel is only used by vessels, especially steamers, bound to or from Stonington, and is good for eleven feet at mean low water. On leaving the harbor, bound to the westward, a red spar-buoy surmounted by a wooden cage will be seen about three-eighths of a mile to the southward of Wamphassuck Point, marking the shoal known as Noyes' Rocks. *Noyes' Rocks.* The least water upon these rocks is twelve feet, and they are, therefore, not dangerous to vessels using this channel,—the buoy being intended as a guide to vessels passing to the northward of the rocks—between them and Wamphassuck Point. This buoy is improperly colored, and should be painted red and black in horizontal stripes; as its present position and color is apt to mislead vessels bound to Stonington, while those passing through the Main Channel of the Sound do not even see it.

When past the buoy the course leads across the long reef which extends from abreast of White Rock to within six hundred yards of The Middle Ground buoy. It has an average width of about one hundred and fifty yards with a depth of from ten to thirteen feet at low water.

On nearing Eel Grass Light-vessel it is not usual for vessels to pass to the northward of it, although it may be safely passed within two hundred yards on that side. It marks the southern extremity of the Eel Grass Ground, which is a shoal about three hundred and fifty yards long, with five feet at low water, extending **NW.** by **N.** and **SE.** by **S.**, and covering, within the limits of three fathoms, a space three-eighths of a mile long and a quarter of a mile wide. On its northwestern side is placed a red spar-buoy (No. 12) in five fathoms, as a guide to vessels using the channel between it and Ellis' Reef.

Eel Grass Ground.

When up with Eel Grass Light-vessel the course changes to the westward,—running nearly for the red buoy on Ram Island Reef. This is a detached reef, bare at low water and surrounded by shoal ground, lying about six hundred and fifty yards **SSE.** from the middle of the southern end of Ram Island. Shoal water extends from the reef to the buoy,—the latter being placed in eighteen feet water four hundred yards **S.** by **E. ¼ E.** from the dry reef. It is a can* of the second class, marked No. 14, and bears from Eel Grass Light-vessel **W. ¾ S.**, a mile and a quarter distant. From this buoy

Ram Island Reef.

	Miles.
Morgan's Point Light-house bears NW. by N......nearly	1 $\frac{1}{8}$
The spindle on Groton Long Point Reef W. by N. ¼ N......nearly	1 $\frac{1}{2}$
Sea-Flower Reef Beacon W.	2 $\frac{3}{4}$
North Hammock Light-house W. by S. ¼ S.	2 $\frac{1}{4}$
The black buoy on Northwest Point Reef W SW......nearly	2 $\frac{5}{8}$

The dry part of the reef is marked by an iron spindle painted red and surmounted by a square cage,—being intended as a guide to vessels passing through the narrow channel between it and Ram Island.

At Ram Island Reef buoy the North and Main channels unite, and the dangers which will be met with passing to the westward are described in their order on pages 318–320.

SAILING DIRECTIONS

FOR PASSING THROUGH FISHER'S ISLAND SOUND BY THE NORTH CHANNEL.

II. *From Stonington.*—After leaving the harbor bring Stonington Light-house to bear **NE.** by **E. ¼ E.** and steer **SW.** by **W. ¾ W.** for Eel Grass Light-vessel, keeping the former light exactly astern and the latter directly ahead, which range will lead across the long reef between White Rock and The Middle Ground in eleven feet water. After crossing the reef the soundings regularly increase to six fathoms and then gradually diminish to four fathoms, increasing again as you approach the light-vessel. When up with the light-vessel pass to the southward of it and steer **W. ½ S.**, which course will lead with not less than seven fathoms past Ram Island Reef buoy and safely out of the Sound, about midway between Sea-Flower Reef Beacon and North Hammock Light-house. When clear of the Sound continue the course until the light-vessel on Bartlett's Reef is seen, which steer for, aiming to pass to the southward of it. Or, when exactly between Sea-Flower Reef Beacon and North Hammock Light-house you may steer **W. ¾ S.**, which will lead about one hundred yards to the southward of Bartlett's Reef Light-vessel.

The above courses pass two hundred yards to the southward of the buoy on Noyes' Rocks; four hundred and fifty yards to the southward of the spindle on Ram Island Reef; six hundred yards to the northward of North Hammock Light-house; and six hundred and fifty yards to the southward of Sea-Flower Reef Beacon.

On the above courses, to enter West Harbor.—When up with Ram Island Reef buoy, with Morgan's Point Light-house bearing **NW.** by **N.**, steer **SW. ¾ W.**, carrying not less than eleven feet, (across the shoal between West and Middle clumps,) until past Clay Point, with Morgan's Point Light-house bearing **N.** by **E. ½ E.** and North Hammock Light-house **NW.** by **W. ½ W.**,—the latter being one mile and an eighth distant. Here you will have between four and five fathoms and must steer **SW. ¾ S.**, which will lead safely with not less than twelve feet to the anchorage.

These courses pass nearly a quarter of a mile to the westward of Middle Clump; two hundred yards to the eastward of West Clump; and three hundred and fifty yards to the westward of Clay Point.

The passage referred to on the preceding page as leading to the northward of Eel Grass Ground and Noyes' Rocks has not less than sixteen feet until past Wamphassuck Point, after which there is not less than three and a quarter fathoms; but it is rarely used,—being unsafe for strangers. Those who use it are accustomed to bring Stonington Light-house to bear **E. ¼ N.** and steer **W. ¾ S.**,

carrying not less than sixteen feet, until within six hundred yards of the spindle on Ellis' Reef, in four fathoms; when Morgan's Point Light-house will bear $W. \frac{3}{4} N.$ and Eel Grass Light-vessel $S. \frac{5}{8} E.$ From this position $SW.$ by $W. \frac{1}{4} W.$ will lead safely up to the buoy on Ram Island Reef; after which a $W. \frac{1}{2} S.$ course leads safely out of the Sound between North Hammock Light-house and Sea-Flower Reef Beacon.

DANGERS

IN PASSING THROUGH FISHER'S ISLAND SOUND BY THE SOUTH CHANNEL.

III. *From the Eastward.*—This channel can only be used by steamers or by small craft whose masters are familiar with its dangers. It may be entered either from the Main Channel or from the Wicopesset Passage, but is more frequently used by vessels which have entered by the latter. It is narrow and crooked, though having deep water, and is, therefore, not recommended.

Leaving the Main to enter the South Channel, beware of Wicopesset Reef, lying on the south side of the passage. This is an extensive piece of shoal ground making out four hundred and fifty yards $NW.$ from Wicopesset Island. It is bare in some places at low water and has six feet on its northwestern end; but this end is not buoyed and great care is necessary to avoid it, especially during ebb tide, which sets directly upon it with a velocity of nearly two miles an hour. Soundings should, therefore, be constantly taken while passing it, and you must not go inside of three fathoms.

Wicopesset Reef.

When past Wicopesset Reef the course continues to the southwestward across Wicopesset Passage; and when nearing East Point you must look out for East Point Shoal, which extends off to the northward and northeastward from that point for three hundred and fifty yards. Three feet at low water is found upon this shoal two hundred yards to the northward of East Point and nearly opposite to the Seal Rocks. This is the most difficult part of the passage, as these two obstructions contract the limit of the channel to a width of about one hundred yards between the lines of three fathoms. Vessels are somewhat aided, however, by the current, which sets here more nearly in the direction of the axis of the channel.

East Point Shoal.

When up with East Point a group of bare rocks will appear on the north side of the channel, with a black spar-buoy about an eighth of a mile to the northward of them. These are the Seal Rocks and the buoy is off their northern end and in the Main Channel. They are surrounded by shoal ground extending to the eastward two hundred yards, and to the southward one hundred yards from the southernmost bare rock; but this southern side is not buoyed and the channel ranges must be watched with great care in order to avoid it.

Seal Rocks.

After passing Seal Rocks the current sets nearly in the direction of the channel, which now becomes very much wider, and so continues until between Middle Clump and Hawk's Nest Point. You should not, however, approach the northern shore of Fisher's Island nearer than two hundred yards until up with East Harbor; and you must look out, on the northern side of the channel, for Young's Rock, which lies about seven hundred yards to the westward of the Seal Rocks and will be recognized by the black spar-buoy on its northern end. It is a detached rock, lying near $N.$ and $S.,$ bare at extreme low tides, and between the lines of six feet covering a space two hundred yards long and one hundred wide. Its southern end is about four hundred yards from the northern shore of Fisher's Island and is not buoyed, but shows itself except at extreme high water.

Young's Rock.

When past Young's Rock there are no dangers in the channel until up with Hawk's Nest Point; and the only directions necessary are to keep not less than four hundred and fifty yards off the northern shore of Fisher's Island while between East Harbor and Hawk's Nest Point, and not to approach the southern end of East Clump nearer than one hundred yards. When near the Hawk's Nest, if you draw more than eleven feet keep well off the shore to avoid Hawk's Nest Point Reef, extending six hundred and fifty yards to the northward from the point with soundings varying from eleven to fifteen feet over it. Eleven feet is found five hundred yards from the point; but there is deeper water (from thirteen to fifteen feet) inshore of it. Vessels of less draught than eleven feet may safely pass close to Hawk's Nest Point with not less than twelve feet at low water. Between the northern end of this reef and Middle Clump the channel is not over two hundred yards wide between the lines of three fathoms,—its width being further contracted on the northern side by the shoal water extending to the southward from Middle Clump. Vessels of less draught than nine feet, however, may approach the clump within two hundred yards.

The extensive reef or area of shoal ground surrounding South Hammock, Flat Hammock, and West and Middle clumps is one of the principal dangers to large vessels using the South Channel. The soundings over it vary from seven to seventeen feet and are very irregular; and no part of the reef is marked by buoys. No directions can be given for avoiding it other than the channel ranges, which must be watched carefully and the Fisher's Island shore kept best aboard. Vessels drawing seventeen feet should not approach Clay Point nearer than two hundred yards; but those drawing twelve feet or

less may pass within one hundred and fifty yards of it. West Clump should receive a berth to the northward of not less than three hundred and fifty yards from vessels drawing seventeen feet or more, and those drawing twelve feet should not approach it nearer than two hundred and fifty yards. When to the westward of Clay Point, vessels drawing seventeen feet should not go to the southward of the line between that point and the southern extremity of North Hill; and, on the other hand, no vessel should approach the southern end of Flat Hammock nearer than three hundred yards.

* *Shoal water extends to the southward from South Hammock* between five and six hundred yards, but vessels drawing twelve feet or less may pass within two hundred and fifty yards of the island. In passing to the westward of it it should receive a berth to the eastward of not less than two hundred yards.

The northern shore of Fisher's Island, between West Point and Northwest Point, should not be approached by vessels drawing seventeen feet nearer than two hundred and fifty yards until the black spar-buoy on *Northwest Point Reef* (see page 320) can be seen, when the course turns abruptly to the northwestward nearly for Sea-Flower Reef Beacon and passes two hundred yards to the eastward of Northwest Point Reef buoy. The channel on this course is extremely narrow, owing to the encroachment upon it of *South Hammock Shoals* on the east and Northwest Point Reef on the west, so that at its narrowest part it is only about a hundred yards wide with about twenty-four feet water. For vessels of twelve feet, however, the available channel is about three hundred yards wide.

The buoy on the northern end of Northwest Point Reef is a black spar, marked No. 7, and placed in ten feet water. When past this buoy you are clear of the South Channel and may shape your course for Bartlett's Reef Light-vessel.

SAILING DIRECTIONS

FOR PASSING THROUGH FISHER'S ISLAND SOUND BY THE SOUTH CHANNEL.

III. *From the Eastward.*—1. *To enter the South Channel from the Main.*—On the $W. \frac{3}{4} N.$ course through the Main Channel, when Stonington Light-House bears $NE.$ by $N. \frac{3}{4} N.$, with a depth of six and a half fathoms, you will see on Fisher's Island, about three-quarters of a mile to the westward of East Point, a large house on a rising ground, and surrounded by a number of outbuildings. This is Winthrop's House, one of the landmarks for this passage, and should bear $WSW.$ from the last-mentioned position, about a mile and an eighth distant. Steer $SW.$ by $W. \frac{3}{4} W.$, heading nearly midway between this house and a clump of woods standing at the base of the hill, about two hundred yards to the southeastward of it, and carrying not less than four and a half fathoms. When just past East Point, with Eel Grass Light-vessel bearing $NW. \frac{5}{8} N.$, a little over a mile and an eighth distant, and North Hammock Light-house $W. \frac{1}{4} N.$, about four miles and a quarter distant, you will be in the narrowest part of the channel, between Seal Rocks and the "three-foot shoal" on the northern side of East Point. Now steer for North Hammock Light-house, ($W. \frac{1}{4} N.$) carrying not less than four and a quarter fathoms, until abreast of Hawk's Nest Point, with Eel Grass Light-vessel bearing $NE. \frac{1}{2} E.$, where the depth will be five and a half fathoms, hard bottom. Now steer $W.$ by $S. \frac{1}{4} S.$, carrying not less than three and a quarter fathoms and heading for the southern end of North Hill. Be careful to keep this bearing of the hill, (the summit a little to the northward of the course,) which will lead you about two hundred yards to the northward of Clay Point in about five fathoms, and continue the course until the eastern extremity of West Point bears $S.$ by $E. \frac{1}{2} E.$, about eight hundred yards distant, and the southwestern extremity of South Hammock $NW.$ by $N.$, three-eighths of a mile distant, when steer $W. \frac{1}{4} S.$ for the northern end of North Hill, having the summit of the hill a little to the southward of the course and carrying not less than three and a half fathoms. Continue this course for about a quarter of a mile until Sea-Flower Reef Beacon bears $NNW.$, when steer for it,—being careful to make the course good, as both flood and ebb set directly across the channel, which is very narrow. If made good this course will lead, with not less than three and a half fathoms, up with the black buoy on Northwest Point Reef, which may be passed at a distance of one hundred yards; and $W.$ southerly will bring you to Bartlett's Reef Light-vessel. The above courses pass one hundred yards to the northward of Wicopesset Reef; the same distance to the southward of Seal Rocks; fifty yards to the northward of the "three-foot shoal" on the northern side of East Point; one hundred and fifty yards to the southward of Young's Rock; four hundred yards to the southward of East Clump; one hundred yards to the northward of the extreme northern limits of Hawk's Nest Point Reef; the same distance to the southward of Middle Clump; two hundred yards to the northward of Clay Point; six hundred yards to the southward of

Sailing Direc- West Clump; four hundred yards to the southward of Flat Hammock; six hundred and fifty yards to the southward of South Hammock; fifty yards to the westward of the extreme southern end of South Hammock Shoals; and two hundred and fifty yards to the eastward, and one hundred yards to the northward, of Northwest Point Reef.

Vessels of twelve feet draught will not be obliged to confine themselves strictly to the above sailing-lines, but may, when on the $W. \frac{1}{4} N.$ course, bring Clay Point in range with the summit of North Hill on a bearing of $W. by S.$ and steer on that range, crossing Hawk's Nest Point Reef in thirteen feet at low water. When near Clay Point they should open the range sufficiently to give it a berth of one hundred and fifty yards to the southward, and when to the westward of it continue the $W. by S.$ course for the summit of North Hill until off the middle of the entrance to West Harbor, with North Hammock Light-house bearing $NW. \frac{1}{4} N.$, seen over the southern end of Flat Hammock. From this position $W. by N. \frac{1}{4} N.$ will lead across the reef in not less than thirteen feet at low water, and the black spar-buoy on Northwest Point Reef will be directly ahead. When within two hundred yards of this buoy they should pass to the northward of it and steer $W. Southerly$ for Bartlett's Reef Light-vessel.

On the above courses, to enter East Harbor.—When, on the $W. \frac{1}{4} N.$ course, Winthrop's House bears $SE. \frac{1}{8} S.$, distant about three-eighths of a mile, and Eel Grass Light-vessel $N. \frac{3}{4} E.$, distant seven-eighths of a mile, you will have six fathoms and $SW. by S.$ will lead safely into the harbor, where you may anchor in fourteen feet. *But, wishing to enter the Inner Harbor:* when Hawk's Nest Point bears $W. \frac{1}{8} N.$, steer $SE. \frac{1}{8} E.$ towards the head of the harbor, and anchor at discretion. Good anchorage may be had on this course in from seven to thirteen feet and well sheltered.

Or, a sailing vessel passing through the Main Channel to the Westward, and finding the wind scant for continuing her $W. \frac{3}{4} N.$ course through the Sound, may, when Eel Grass Light-vessel bears $N. \frac{1}{8} E.$ and North Hammock Light-house $W. \frac{1}{8} S.$, steer $W. by S. \frac{1}{4} S.$, which course will lead to the southward of East Clump, and between Middle Clump and Hawk's Nest Point Reef, with not less than three and a half fathoms. This course should be continued, as before described in the directions for the South Channel, until the southwestern extremity of South Hammock bears $NW. by N.$ and West Point $S. by E. \frac{1}{2} E.$, when $W. \frac{1}{4} S.$ must be steered for the northern end of North Hill, having the summit of the hill a little to the southward of the course and carrying not less than three and a half fathoms. This course continued for about a quarter of a mile will bring Sea-Flower Reef Beacon to bear $NNW.$, when it should be steered for,—being careful to make the course good, as both flood and ebb set directly across the narrow channel. If made good this course will lead, with not less than three and a half fathoms, to the black buoy on Northwest Point Reef, which may be passed at a distance of one hundred yards, and $W. Southerly$ steered for Bartlett's Reef Light-vessel, as before.

But, if a vessel be of twelve feet draught, or less, she may, when North Hammock Light-house bears $NW. \frac{1}{2} N.$ and the summit of North Hill $W. by S. \frac{1}{8} S.$, steer $W. by N. \frac{1}{4} N.$, following the directions given above for vessels of this class and crossing the reef to the southward of Flat and South hammocks in not less than thirteen feet at mean low water.

To enter West Harbor from the South Channel.—On the $W. by S. \frac{1}{4} S.$ course, when past Clay Point and in four and a half fathoms, muddy bottom, with Morgan's Point Light-house bearing $N. by E. \frac{1}{2} E.$ and North Hammock Light-house $NW. by W. \frac{1}{2} W.$, (in range with the northeastern extremity of Flat Hammock,) steer $SW. \frac{3}{4} S.$ into the harbor, carrying not less than twelve feet past West Point and up to the anchorage.

2. Having come through the Wicopasset Passage, to enter the South Channel.—On the $NW. \frac{3}{4} N.$ course through this passage, when Stonington Light-house bears $NE. by N. \frac{3}{8} N.$, Latimer's Reef spindle $NW. \frac{3}{8} N.$, and Eel Grass Light-vessel $NW. \frac{1}{4} W.$, steer $WSW.$, which will lead, with not less than four fathoms, through the narrow passage between Seal Rocks and the "three-foot shoal" on the northern side of East Point. On this course, when Eel Grass Light-vessel bears $NW. \frac{3}{8} N.$, a little over a mile and an eighth distant, and North Hammock Light-house $W. \frac{1}{4} N.$, about four miles and a quarter distant, steer for the latter, and follow the directions for the South Channel.

HARBORS IN FISHER'S ISLAND SOUND.

The only harbors of importance in the Sound, otherwise than mere anchorages, are those of Stonington and Mystic, and of these two only the former can safely be entered without a pilot.

STONINGTON HARBOR

is formed by a large cove about a mile long and having an average width of six hundred and fifty yards, which indents the northern shore of the Sound just to the westward of Little Narragansett Bay. It is at best a narrow and contracted harbor, open to southerly and southwesterly winds; and convenient anchorage is difficult to find except for vessels of less than nine feet draught. Its entrance is between Windmill Point on the east and Wamphassuck Point on the west, where it is about five-eighths of a mile wide; but it contracts to a width of about nine hundred yards at the lower end of the village, then to about seven hundred yards at **Steamboat Point**, and so continues gradually to contract as you approach the head of the cove, where, about eight hundred yards above **Steamboat Wharf**, it is only four hundred and fifty yards wide. Here **Quanaduck Cove** makes in to the northeastward,—a narrow and shallow stream, which is closed by a bridge three hundred and fifty yards above its mouth; while to the northwestward the harbor spreads out into a wide but shallow cove about three-eighths of a mile in width and known as the **Head of the Harbor**. Above the village there is no anchorage except for very small vessels.

Windmill Point, when seen from the southward, is easily recognized by the light-house near its southern end. From the light-house a gentle grassy slope descends to the extremity of the point; but to the northward only thickly-clustered houses are seen. These form the southern end of the village of Stonington, which occupies the eastern shore of the harbor from the mouth of **Quanaduck Cove** to the light-house. A notable object, which is also used as a landmark, is a large stone factory in the village, which is surmounted by a cupola and will appear just to the westward of the light-house.

Windmill Point.

Stonington Light-house will appear as a white tower rising from the roof of a dwelling of the same color. It shows a fixed white light, of the sixth order, from a height of fifty-nine and a half feet above the sea, visible eleven miles. Its geographical position is

Stonington Light-house.

Latitude	41° 19' 41" N.
Longitude	71° 54' 21" W.

There is no fog-signal.

Wamphassuck Point, the western point of entrance to Stonington Harbor, is long and low, gently sloping, bare of everything except a scanty growth of grass, and has bare ledges cropping out all over its surface. To the northward of it rises **Wamphassuck Hill**, which is not, however, at all conspicuous from a distance,—being a mere grassy summit about forty-five feet high, with a few houses along its eastern slopes. Just to the westward of it rises **Palmer's Hill**, also smooth and grassy, somewhat more than a hundred feet high, with a single house upon its summit.

Wamphassuck Point.

The anchorage opposite Stonington is protected by a stone breakwater extending southeasterly from near **Wamphassuck Point**. It is intended to extend this breakwater to a length of two thousand feet.

From **Wamphassuck Hill** to the northward the western shores of the harbor are low and level, and, where not under cultivation, grassy.

On the eastern shore, about two hundred yards to the northward of the light-house, a stone breakwater extends out about two hundred and fifty yards. On its western end is erected a stone structure or beacon surmounted by a barrel painted black. In foggy weather a bell is rung from this beacon.

The village of **Stonington** is of some importance, especially during the summer,—being in the vicinity of the hotels at **Watch Hill** and also the terminus of the New York and Stonington line of steamers,—a favorite route to Boston during the summer. There is also some manufacturing interest. Above the village the eastern shore of the harbor is composed of low level lands, almost entirely cleared, dotted with handsome houses surrounded by ornamental grounds. A small hillock at the southern side of the entrance to **Quanaduck** is the only rising ground.

The northern shores of the harbor also show low level lands, part grass and part marsh, with groups of houses here and there,—the whole being backed by higher ground covered with very thick woods.

Not more than eight feet at low water can be taken up to the **Steamboat Wharf** at Stonington. Vessels of larger draught than eight feet usually round the breakwater and anchor between it and the wharf-line in from ten to twelve feet.

DANGERS

IN APPROACHING AND ENTERING STONINGTON HARBOR FROM THE EASTWARD.

I. *By the Watch Hill Passage.*—Having come through this passage, the usual practice is to continue on the W. $\frac{3}{4}$ N. course (see page 321) until **Stonington Light-house** bears N. by W. Westerly; and then, unless the vessel be of less than nine feet draught, to steer NW. $\frac{1}{4}$ W. towards **The Middle Ground buoy**, which will soon be seen nearly ahead bearing about NW.

The Middle Ground is a large flat extending to the westward from the shore between Napatree and Sandy points. Nine feet at low water is found in several places along its western edge, nearly a

The Middle Ground. mile from shore; and the buoy, which is a second-class can,* painted red and marked No. 6, is placed in eighteen feet water about three hundred yards to the southward of its western extremity. It bears from Napatree Point Ledge buoy (see page 315) NW.

$\frac{7}{8}$ W., one mile distant; and from it Stonington Light-house bears N. by E. $\frac{1}{2}$ E. Easterly, one mile and an eighth, and the beacon on the end of the breakwater N. $\frac{3}{4}$ E., one mile and a quarter distant.

When up with the buoy the course continues to the westward for about three hundred and fifty yards; and if the weather be clear there may be seen, bearing about NW. by N. $\frac{1}{2}$ N. and three-quarters of a mile off, a spar-buoy painted red and surmounted by a square cage. This is on Noyes' Rocks, before mentioned, (see page 326,) but which are not in the way of vessels entering by this channel,—the course passing half a mile to the eastward of them.

After passing The Middle Ground buoy the course turns to the northward, leading nearly for the beacon on the breakwater; and there will soon be seen about half a mile to the eastward, bearing about E. by N. $\frac{1}{4}$ N., a red spar-buoy (No. 2). This is on Bartlett's Reef, a rocky shoal with from four to five feet water, extending about three hundred yards in a N. and S. direction. Its

Bartlett's Reef. centre is about half a mile to the westward of Sandy Point and three-eighths of a mile to the southward of Windmill Point; and the buoy is placed on its southwestern side in eleven feet water. This reef is a dangerous obstruction to the entrance to Little Narragansett Bay, but is not in the way of vessels bound to Stonington by this passage unless they are standing to the eastward on a wind; in which case they should go about as soon as Stonington Light-house bears N. $\frac{5}{8}$ W. The sailing-line passes half a mile to the westward of the reef.

When past this buoy a striped spar-buoy will be seen a little to the southward of Windmill Point. This is on Single Rock, a sunken rock with five feet water, which lies between sixty and seventy yards to the southward of the extremity of the point. There is no passage north of it, nor

Single Rock. is it in the way of vessels entering Stonington by this channel unless they are standing to the eastward on a wind; in which case they should not go to the eastward of the breakwater beacon bearing N. by W. $\frac{1}{4}$ W. The buoy, which is painted red and black in horizontal stripes, is placed well to the southward of the rock as a guide to vessels bound into Little Narragansett Bay and Pawcatuck River.

On coming abreast of the light-house a black spar-buoy will be seen to the westward of the course and about four hundred yards off. It is nearly abreast of the breakwater beacon and marks

Penguin Shoal. the southwestern side of Penguin Shoal, a detached ledge with four feet at low water, extending NNE. and SSW., about an eighth of a mile from the Wamphassuck shore. The buoy is marked No. 1, placed in eleven feet on the southeastern side of the shoal, and bears from The Middle Ground buoy N. Easterly, one mile and a quarter; from Stonington Light-house NW. by W. $\frac{1}{2}$ W., three-eighths of a mile; and from the breakwater beacon W. $\frac{1}{4}$ S., about three hundred and fifty yards distant. From this buoy the end of Steamboat Wharf bears NE. $\frac{3}{4}$ N., about six hundred yards distant.

A portion of the upper part of Penguin Shoal has been removed by the U. S. Engineers, and it is probable that the whole will be dredged to a depth of twelve feet at low water within a few years.

Above Penguin Shoal there are no dangers until Steamboat Wharf is reached, above which none go but vessels of the smallest description. As before mentioned, Stonington Harbor is open to southerly and southwesterly winds.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING STONINGTON HARBOR FROM THE EASTWARD.

I. By the Watch Hill Passage.—Continue the W. $\frac{3}{4}$ N. course (see page 321) until Stonington Light-house bears N. by W. Westerly and Eel Grass Light-vessel W. by N. $\frac{7}{8}$ N., where you will have six fathoms and may steer NW. $\frac{1}{4}$ W., which will bring you up with The Middle Ground buoy with not less than eighteen feet. Continue this course past the buoy until Stonington Light-house bears NE. by N. $\frac{3}{4}$ N. and Eel Grass Light-vessel W. $\frac{1}{4}$ N., where you will have three and a half fathoms, and N. by E. $\frac{1}{4}$ E. will lead safely into the harbor and up with the end of the breakwater, carrying not less than thirteen feet. Round the beacon to the northward and anchor on the northern side of the breakwater, between it and the wharf-line, in from ten to twelve feet at mean low water. If of light draught (less than eight feet) you may haul over towards the western shore of the harbor to be out of the way of the steamboats and anchor in from seven to eleven feet under the Wamphassuck breakwater, about an eighth of a mile from shore, and directly opposite Steamboat Wharf.

UNITED STATES COAST AND GEODETIC SURVEY.

NOTICE TO MARINERS.

No. 29.

ATLANTIC COAST.

CONNECTICUT.

BREAKWATER IN PROCESS OF CONSTRUCTION TO THE
WESTWARD OF BARTLETT'S REEF, FISHER'S ISLAND
SOUND.

Information has just been received at this Office of the construction, by the U. S. Engineers, of a breakwater in Fisher's Island Sound, intended to protect the harbor of Stonington from southerly winds. At present the eastern end of the structure is exactly on a line between the chimney of Knapp's house (on Napatree Point) and the eastern end of the breakwater off Wamphassuck Point. From this position it is intended to extend the structure, if found necessary, two thousand feet, W. by S. $\frac{3}{4}$ S., thus crossing the sailing-line for light-draught vessels, given in the Coast Pilot for entering Stonington Harbor through Lord's Passage. The following changes have, therefore, become necessary in the directions for this passage given in the second edition of the Atlantic Coast Pilot, Division B, (Boston to New York:)

1. *On page 333, paragraph 4.*—Discard this paragraph altogether, as the sailing-line leads directly across the new breakwater.

2. *Same page, paragraph 6, lines 2 and 3.*—For the phrase "N. by W. $\frac{1}{2}$ W., which will lead directly up to abreast of the breakwater," substitute "N. by W. $\frac{1}{4}$ W., which will pass within fifty yards of the eastern end of the breakwater off Bartlett's Reef, and will lead directly for the beacon on the inner breakwater."

3. *Same page, paragraph 7, line 2.*—For "nearly two hundred yards" read "one hundred and fifty yards."

Carlile P. Patterson,
Superintendent.

COAST AND GEODETIC SURVEY OFFICE,
Washington, April 27, 1881.

*This Notice affects also Coast and Geodetic Survey Charts Nos. 114 and 358.
All bearings and courses are magnetic.*

The above courses pass about fifty yards to the westward of The Middle Ground *Sailing Directions--Stonington Harbor.* buoy; two hundred yards to the westward of the western end of The Middle Ground; half a mile to the eastward of Noyes' Rocks; the same distance to the westward of Bartlett's Reef; four hundred and fifty yards to the westward of the striped buoy on Single Rock; and an eighth of a mile to the eastward of the black buoy on Penguin Shoal.

Or, you may continue the W. $\frac{3}{4}$ N. course until Stonington Light-house bears N. $\frac{1}{4}$ W. and Eel Grass Light-vessel W NW., where you will have ten and a half fathoms, and NW. $\frac{3}{4}$ N. will lead past The Middle Ground buoy with not less than six fathoms. When past the buoy, and Stonington Light-house bears NE. by N. $\frac{3}{4}$ N. and Eel Grass Light-vessel W. $\frac{1}{4}$ N., you will have three and a half fathoms, and N. by E. $\frac{1}{4}$ E. will lead safely into the harbor, as before.

Or, you may continue the W. $\frac{3}{4}$ N. course until Stonington Light-house bears N. $\frac{1}{2}$ E., when it will be in range with the cupola on the large building near the northern end of the village. Here the depth will be ten fathoms and you may steer N NW., carrying not less than nine fathoms, until up with the red buoy on The Middle Ground. Continue this course past the buoy until Stonington Light-house bears NE. by N. $\frac{3}{4}$ N. and Eel Grass Light-vessel W. $\frac{3}{4}$ N., as before, when steer N. by E. $\frac{1}{4}$ E., following the directions previously given. The N NW. course passes about one hundred and fifty yards to the westward of The Middle Ground buoy.

Or, if you draw less than ten feet you may, as soon as Stonington Light-house bears N. $\frac{1}{2}$ E. and is in range with the cupola as before, steer for it, keeping the range and crossing The Middle Ground in eleven feet. On this course, when abreast of Bartlett's Reef buoy, in sixteen feet water, with Morgan's Point Light-house bearing W. $\frac{5}{8}$ N. and the southern extremity of Wamphassuck Point NW., steer N. $\frac{1}{8}$ W.; which course will lead, with not less than thirteen feet, to abreast of the end of the breakwater.

The above courses pass nearly five hundred yards to the eastward of the red buoy on The Middle Ground; fifty yards to the westward of the southwestern end of The Middle Ground; three hundred and fifty yards to the westward of the red buoy on Bartlett's Reef; and one hundred and fifty yards to the westward of the striped buoy on Single Rock.

Or, if of less draught than nine feet you may, when, on the W. $\frac{3}{4}$ N. course, Stonington Light-house bears N. by W. Westerly and Eel Grass Light-vessel W. by N. $\frac{5}{8}$ N., as before, steer N. by W. $\frac{1}{2}$ W., which will lead directly up to abreast of the breakwater, crossing The Middle Ground in not less than nine feet.

The above course passes half a mile to the eastward of the red buoy on The Middle Ground; nearly two hundred yards to the westward of Bartlett's Reef buoy; and one hundred yards to the westward of the striped buoy on Single Rock.

II. *By Lord's Passage.*—The dangers in this channel have been already described on pages 324–325, and it is therefore unnecessary to repeat them here. The course through the channel is, as before mentioned, N. $\frac{1}{2}$ E. for Stonington Light-house, in range with the cupola on the large building at the northern end of the village. *Wishing to carry in the best water*, this course should be continued until Eel Grass Light-vessel bears NW. by W. $\frac{3}{4}$ W., when you will have ten fathoms, and N NW. will carry you past The Middle Ground buoy with not less than nine fathoms. Continue this course until Stonington Light-house bears NE. by N. $\frac{3}{4}$ N. and Eel Grass Light-vessel W. $\frac{1}{4}$ N., where you will have three and a half fathoms, and N. by E. $\frac{1}{4}$ E. will lead safely into the harbor and up with the end of the breakwater. The least water on the last course is thirteen feet and will be found off the end of the breakwater.

In the above directions the N NW. course passes two hundred yards to the westward of the red buoy on The Middle Ground.

DANGERS

IN APPROACHING AND ENTERING STONINGTON HARBOR FROM THE WESTWARD.

II. *By the Main Channel.*—As the dangers in the Main Channel of Fisher's Island Sound have been already fully discussed it is only necessary to refer the mariner to pages 315–320 for a description of them; only premising that as they are described on those pages as for a vessel bound to the westward, he will now meet them in the reverse order. That is, he will enter the Sound between Sea-

Flower Reef on the north and North Hammock on the south; unless beating to windward he will not approach West or Middle Clump; but the next danger met with will be *Ram Island Reef*, to the southward of which he will pass. About a mile and a half to the westward he will pass Eel Grass Light-vessel; and here the course turns to the northeastward,—running for Stonington Light-house; and a mile and a quarter to the eastward of the light-vessel *Noyes' Rocks* will be passed, lying about three hundred yards to the northward of the course. The last danger met with will be *Penguin Shoal*, which lies abreast of the breakwater.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING STONINGTON HARBOR FROM THE WESTWARD.

III. *By the Main Channel.*—Being about a hundred yards to the southward of Bartlett's Reef Light-vessel (in Long Island Sound) steer **E. $\frac{3}{4}$ N.**, which course will lead into Fisher's Island Sound, (carrying not less than four and a quarter fathoms,) passing between Sea-Flower Reef Beacon and North Hammock but nearer to the latter. When abreast of North Hammock Light-house, having it bearing **S. $\frac{5}{8}$ E.**, four hundred yards distant, steer **E. $\frac{3}{4}$ N.**, which will lead, with not less than seven and a half fathoms, to Eel Grass Light-vessel. Pass to the southward of this and steer **NE. by E. $\frac{3}{4}$ E.**, carrying not less than eleven feet, until within six hundred yards of the light-house, in seventeen feet, with the breakwater beacon bearing **N. by E. $\frac{3}{4}$ E.**, when steer **N. by E. $\frac{1}{4}$ E.** until abreast of the end of the breakwater, in thirteen feet, when you may round it to the northward and anchor on its northern side, between it and the wharf-line, in twelve feet water; or, if of less draught than eight feet, you may haul over towards the western shore and anchor in from seven to eleven feet, under shelter of Wamphassuck breakwater, about two hundred and fifty yards from shore and nearly abreast of Steamboat Wharf.

The above courses pass nine hundred yards to the southward of Sea-Flower Reef Beacon; three hundred yards to the northward of North Hammock; half a mile to the northward of West Clump; the same distance to the southward of the buoy on The Sweeper's Ground; nine hundred yards to the northward of Middle Clump; one hundred and fifty yards to the southward of the red buoy on Ram Island Reef; half a mile to the northward of East Clump; four hundred yards to the southward of the Eel Grass Ground; half a mile to the northward of the spindle on Latimer's Reef; two hundred yards to the southward of the buoy on Noyes' Rocks; and an eighth of a mile to the eastward of the black buoy on Penguin Shoal.

DANGERS

IN APPROACHING AND ENTERING STONINGTON HARBOR FROM THE WESTWARD.

III. *By the Northern Passage, between Eel Grass Ground and Ellis' Reef.*—This passage is only available in day-time and is not recommended to strangers. Leaving the Main Channel abreast of Ram Island Reef buoy it proceeds to the northeastward, passing about midway between the northern end of the Eel Grass Ground and the spindle on Ellis' Reef. Then it turns to the eastward, passing to the southward of White Rock and between Wamphassuck Point and Noyes' Rocks, joining the common sailing-lines about a quarter of a mile from Stonington Light-house.

When up with Ram Island Reef buoy the course leads to the northeastward, and there will soon be seen a little to the eastward of the course, bearing about **E NE.** and half a mile off, a red spar-buoy (No. 12). This is on the northern end of the Eel Grass Ground, before described on pages 317–318 as a shoal about three hundred and fifty yards long, with five feet at low water, extending **NW. by N.** and **SE. by S.**, on the northern side of the Main Channel. Within the lines of three fathoms the shoal ground covers a space three-eighths of a mile long and a quarter of a mile wide. The buoy is placed in five fathoms to the westward of the northern end of the shoal as a guide to the Northern Passage; and the light-vessel is placed on the southern side as a guide to the Main Channel of the Sound. The buoy bears from

Morgan's Point Light-house, E. by S. $\frac{1}{2}$ S. -----	Miles. $1\frac{5}{8}$
The southwestern extremity of Ram Island, E. Southerly -----	$1\frac{1}{4}$
Ram Island Reef spindle, E. by N. $\frac{1}{8}$ N. -----	1
Ram Island Reef buoy, NE. by E. $\frac{1}{4}$ E. -----	1

From this buoy

The spindle on Ellis' Reef bears N. $\frac{1}{4}$ W. -----	Miles. $\frac{1}{4}$
White Rock NE. by E. $\frac{1}{4}$ E. -----	nearly 1
The buoy on Noyes' Rocks E. by N. Northerly -----	nearly $1\frac{1}{2}$
Stonington Light-house E. by N. $\frac{1}{4}$ N. -----	a little over $2\frac{1}{4}$

On the northern side of the channel, about a quarter of a mile to the northward of the red buoy on the Eel Grass Ground, will be seen an iron spindle painted black and surmounted by a square cage, and a black spar-buoy will appear about three hundred and fifty yards to the northward of it. The spindle is on the dry part of Ellis' Reef and the buoy is placed in eleven feet on the southern side of the northernmost channel in Fisher's Island Sound, which is *Ellis' Reef*. Sometimes used by vessels bound between Stonington and Mystic. Vessels using this passage pay no attention to it but pass well to the southward of the spindle. Ellis' Reef is a small detached reef, dry at low water, lying about five-eighths of a mile S. $\frac{1}{2}$ W. from the southern end of Dodge's Island and nine hundred yards SE. $\frac{1}{8}$ E. from the southern end of Baker's Island. The spindle bears from

The black buoy to the northward of Ellis' Reef, S. $\frac{3}{8}$ E.	a little over	300 yards.
The southern end of Ram Island, E. $\frac{7}{8}$ N.		1 mile.
Morgan's Point Light-house, E. $\frac{7}{8}$ S.	a little over	1 $\frac{1}{2}$ miles.
The spindle on Ram Island Reef, NE. by E. $\frac{3}{4}$ E.	nearly	1 $\frac{1}{8}$ "
North Hammock Light-house, E. by N. $\frac{1}{4}$ N.		3 $\frac{3}{8}$ "

From this spindle

Red Reef buoy bears NE. by E. $\frac{5}{8}$ E.		$\frac{1}{8}$ mile.
White Rock E. by N. $\frac{1}{2}$ N.		1700 yards.
Stonington Light-house E. $\frac{3}{4}$ N.		2 $\frac{1}{4}$ miles.
Noyes' Rock buoy E. $\frac{1}{8}$ N.	a little over	1 $\frac{3}{8}$ "

When past Ellis' Reef and between it and White Rock, if standing to the northward on a wind do not go to the northward of White Rock bearing E. $\frac{1}{4}$ N. and in range with Stonington Light-house. This will avoid the dangerous reefs which lie between Baker's Island and Wamphassuck Point, and of which may be mentioned in this connection *Cormorant Reef*, a mass of rocks, some bare at all times and others at low water, lying about four hundred yards to the eastward of Bush Island. Shoal water extends in a northeasterly direction from the dry rocks for nearly four hundred yards.

White Rock, which will be seen from abreast of Ellis' Reef spindle, about three-quarters of a mile off, and bearing about NE. by E. $\frac{1}{2}$ E., is a rocky islet about seventy-five yards long in an E. and W. direction and between twenty and thirty yards wide. It lies on the northern side of this passage, a little over three-quarters of a mile W. by S. from the *White Rock*. southern end of Wamphassuck Point and a mile and an eighth E. $\frac{1}{4}$ S. from the southern end of Baker's Island. Stonington Light-house bears from the centre of the rock E. $\frac{1}{4}$ N., a little over a mile and three-eighths, and the buoy on Noyes' Rocks E. by S. $\frac{1}{2}$ S., five-eighths of a mile distant.

When abreast of White Rock the buoy on Noyes' Rocks will appear a little to the southward of the course,—bearing about E. $\frac{1}{4}$ S. and nearly twelve hundred yards distant. It is a spar-buoy, painted red, surmounted by a square cage and placed a little to the northward of the shoalest part of Noyes' Rocks, which has twelve feet upon it. It bears from *Noyes' Rocks*. White Rock E. by S. $\frac{1}{2}$ S., five-eighths of a mile; from the spindle on Ellis' Reef E. $\frac{1}{4}$ N., nearly one mile and a half; and from Morgan's Point Light-house E. $\frac{1}{4}$ S., three miles distant. From this buoy the southern end of Wamphassuck Point bears N NE., three-eighths of a mile, and Stonington Light-house E. by N. $\frac{3}{4}$ N., seven-eighths of a mile distant.

When up with Noyes' Rocks you must look out on the northern side of the passage for Wamphassuck Point Reef, which is nothing more than an extension of the point, making off for about five hundred yards from shore with less than six feet water. A buoy was formerly placed in seven feet on its southern side about eighty feet from shore, and bearing from White Rock E. $\frac{1}{8}$ N., three-quarters of a mile, and from the buoy on Noyes' Rocks N NE., three-eighths of a mile distant. From this buoy Stonington Light-house bore E. $\frac{1}{4}$ S., nearly fourteen hundred yards distant. *Wamphassuck Point Reef*.

When past Wamphassuck Point, and turning up into the harbor, a black spar-buoy will be seen a little to the westward of the course and about four hundred yards off. This is on Penguin Shoal, (see also page 332,) a detached ledge, with four feet at low water, extending N NE. and S SW., about an eighth of a mile from the Wamphassuck shore. The buoy *Penguin Shoal*. is marked No. 1, placed in eleven feet on the southeastern side of the shoal, and bears from Stonington Light-house NW. by W. $\frac{1}{2}$ W., three-eighths of a mile, and from the breakwater beacon W. $\frac{1}{4}$ S., about three hundred and fifty yards distant. From this buoy the end of Steamboat Wharf bears NE. $\frac{1}{4}$ N., about six hundred yards distant.

A portion of the upper part of Penguin Shoal has been removed by the U. S. Engineers, and it is probable that the whole will be dredged to a depth of twelve feet at low water within a few years. Above Penguin Shoal there are no dangers.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING STONINGTON HARBOR FROM THE WESTWARD.

IV. *By the Northern Passage, between Eel Grass Ground and Ellis' Reef.*—Being about a hundred yards to the southward of Bartlett's Reef Light-vessel, (in Long Island Sound,) steer **E. $\frac{3}{4}$ N.**, which course will lead into Fisher's Island Sound, carrying not less than four and a quarter fathoms, passing between Sea-Flower Reef Beacon and North Hammock, but nearer to the latter. Continue this course, carrying not less than eight fathoms, until Morgan's Point Light-house bears **N. by E. $\frac{1}{2}$ E.** and Eel Grass Light-vessel **E. $\frac{1}{2}$ N.** Here the depth will be about ten fathoms, and you must steer **E. $\frac{1}{2}$ N.** toward the light-vessel, carrying not less than nine fathoms, until up with the red buoy on the southern end of Ram Island Reef. Pass about fifty yards to the southward of this and steer **NE. by E. $\frac{3}{8}$ E.**, passing about midway between Ellis' Reef and Eel Grass Ground with not less than five fathoms. Continue this course until Stonington Light-house bears **E. $\frac{1}{8}$ N.**, when you will have four fathoms and must steer for the light-house, carrying not less than sixteen feet, until within a quarter of a mile off it,—the breakwater beacon bearing **NE. by N. $\frac{3}{4}$ N.**,—and **N. by E. $\frac{1}{4}$ E.** will lead safely up to the end of the breakwater.

The above courses pass about fifty yards to the southward of the red buoy on the southern end of Ram Island Reef; one hundred yards to the northwestward of the red buoy on the northwestern end of the Eel Grass Ground; three hundred yards to the southward of Ellis' Reef; the same distance to the northward of the northern end of the Eel Grass Ground; an eighth of a mile to the southward of White Rock; the same distance to the northward of the buoy on Noyes' Rocks; three hundred yards to the southward of Wamphassuck Point Reef; and an eighth of a mile to the eastward of the black buoy on Penguin Shoal.

Or, when on the E. $\frac{3}{4}$ N. course you come abreast of North Hammock Light-house bearing **S. $\frac{3}{4}$ E.** and four hundred yards off, you may steer **E. $\frac{3}{4}$ N.** for Eel Grass Light-vessel until past Ram Island Reef buoy and Morgan's Point Light-house bears **NW. $\frac{1}{2}$ N.**, in range with Ram Island Reef spindle. Here there will be nine and a half fathoms, and **NE. by E.** will lead, with not less than five and a half fathoms, between Ellis' Reef and the Eel Grass Ground. Continue this course until Stonington Light-house bears **E. $\frac{1}{8}$ N.**, where there will be four fathoms, and you must steer for the light-house, following the directions given above.

The above courses pass one hundred and fifty yards to the southward of Ram Island Reef buoy and fifty yards to the northwestward of the red buoy on the northwestern end of the Eel Grass Ground.

TIDES.

Corrected Establishment.....	9 ^h 5 ^m
Mean Rise and Fall of tides.....	2.7 ft.
Mean Rise and Fall of Spring tides.....	3.0 ft.
Mean Rise and Fall of Neap tides.....	2.6 ft.
Mean duration of Rise.....	6 ^h 15 ^m
Mean duration of Fall.....	6 ^h 10 ^m

VARIATION OF THE COMPASS.

The magnetic variation for 1880 is **9° 20' W.**, with an annual increase of **2 $\frac{1}{2}$ '**.

LITTLE NARRAGANSETT BAY.

But little useful information can be given in regard to this bay, as it is only navigable for vessels of the lightest draught and then only with an experienced pilot. It is a wide but very shallow bay, about a mile and a half long in a **N NW.** and **S SE.** direction and having an average width of three-quarters of a mile **E.** and **W.** On the northern side opens the mouth of **Wicket-equoock River**,—a shallow stream of no importance, and which is crossed by the Providence and Stonington Railroad about five-eighths of a mile above its mouth. Into its southeastern corner flows the Pawcatuck River,—also a shallow stream but of some little importance. It runs in a northeasterly direction for four miles to the settlement of Pawcatuck Bridge, which occupies the western bank, and Westerly, which occupies the eastern bank.

The entrance to Little Narragansett Bay is contained between Sandy Point on the east and Windmill Point on the west, and is three-quarters of a mile wide, but much obstructed by flats. The channel leads close under Windmill Point, where there is a depth of from eleven to twelve feet, but this rapidly decreases and beyond the entrance it is not safe for strangers to go.

Windmill Point, before described, (see page 331,) is easily recognized by Stonington Light-house, situated near its southern end. From the light-house a gentle grassy slope descends to the extremity of the point; but to the northward only thickly-clustered houses are seen. These form the southern end of the village of **Stonington**.

Sandy Point, the eastern point of entrance to the bay, is a mere low strip of sand, thinly covered with grass, and has a single small hillock about a quarter of a mile below its northern end. It is surrounded by extensive flats and is constantly changing its form, so that it is not safe to approach it from any direction.

The northern shores of Little Narragansett Bay, from Windmill Point to the mouth of Wicketequock River, are composed for the most part of low flat land destitute of trees, with occasional low hillocks near the shore, and level grassy fields dotted with houses in the background. The western bank of the river is composed of marsh and meadow land, backed by rolling country which extends to the Toguang Hills. These hills, which are quite remarkable in **Toguang Hills**, the otherwise flat country, extend in a chain to the northeastward and average in height from eighty to two hundred feet. The highest of these, such as **Noyes'**, **Eel's**, **Milebrock**, **Staunton**, and **Wicketequock** hills, are bare of trees; but in the valleys and on the spurs of the lesser hills dense woods are seen.

The eastern bank of Wicketequock River is composed of smooth and gently sloping grassy land rising to the summit of the hills beyond, and faced by a narrow strip of marsh. Its eastern point of entrance is formed by a smooth grassy hill rising to a height of one hundred feet, and at its southern end sending off a long spur between twenty and thirty feet high. To the eastward of this marshy land extends along the northern shores of the bay for three-quarters of a mile, where thick woods begin and extend to the northward to the base of Staunton Hill.

Elihu's Island, an island of very irregular shape, lies in the mouth of Wicketequock River. It is, in fact, two islands connected by a strip of marsh. The eastern island lies **N. E.** and **S. W.** and is three-eighths of a mile long; while the western lies **N. E.** by **E.** and **S. W.** by **W.** and is between six and seven hundred yards long. Both **Elihu's Island** are bare of trees and rise with a very gentle slope to a height of between forty and fifty feet.

About three hundred yards **S.** by **W.** $\frac{1}{2}$ **W.** from the southwestern extremity of Elihu's Island lies a mass of bare rock a little over a hundred yards long in a **N.** and **S.** direction, known as **Rhodes' Folly**. On its northern end is a spindle which marks the southern side of the channel into Little Narragansett Bay.

The eastern shores of the bay are composed mostly of low, nearly level, grassy lands with occasional marsh until you come to Pawcatuck Point, (the northern point of entrance to Pawcatuck River,) which rises very gently to a height of between sixty and seventy feet and is crowned with a dense growth of trees. There is a *dangerous reef off this point* extending in a southwesterly direction for an eighth of a mile. **Pawcatuck Point.**

The southern point of entrance to Pawcatuck River is composed of flat marshy land dotted with a number of small hillocks,—the level land extending back to the foot of Watch Hill. In fact, this is the general character of both banks of the river as far up as Westerly;—that is, a narrow strip of marshy land skirting the shore and a rolling country with occasional high grassy hills behind it.

Pawcatuck River has a general course **N. E.** by **E.** from its mouth for about a mile and three-quarters past the settlement of **Lottery**, which is built on its eastern bank. It then runs nearly **N.** by **E.** for three-quarters of a mile; then, with a short turn to the westward, it runs **N.** for the same distance; then **N. E.** by **N.** for half a mile; and, finally, about **N.** by **E.** past the village of **Westerly** and up to Pawcatuck Bridge. At its mouth it is a quarter of a mile wide; **Pawcatuck River.** but gradually contracts in width and about a mile above its mouth it is not quite a hundred yards wide. Above this point it again widens and keeps an average width of about three hundred yards for three-quarters of a mile; above which it gradually contracts until abreast of the village of Westerly it is only fifty yards wide. Here the river is closed by **Pawcatuck Bridge.**

About five-eighths of a mile above the mouth of the river will be seen a long neck of land projecting in a nearly **E.** direction from the eastern bank. It is little more than twenty feet in height, with a nearly level summit, and bare of trees. This is **Graves Neck**, which, by its projection into the stream, diminishes the width of the river at this point to one hundred and fifty yards. On its southern side a shallow cove makes in an easterly direction for three-eighths of a mile,—the shores being composed entirely of marsh;—and just above the neck is the village of **Lottery**, also on the eastern bank. **Graves Neck.**

About a quarter of a mile above **Lottery** the eastern bank shows occasional wooded hills and, in one or two places, clumps of trees rising from the level lands; but as a rule both banks are flat and marshy with high rolling lands behind them. The village of **Westerly** occupies the eastern bank and the settlement of **Pawcatuck Bridge** the western. The former is in **Rhode Island** and the latter in **Connecticut**,—the river being the boundary line between the two States.

To the southward of **Pawcatuck River** the eastern shore of Little Narragansett Bay is formed by **Watch Hill**, which descends to the westward with a gentle slope to a flat plain covered only with grass. The hill is bare of trees and shows many bare ledges cropping out along its western face. The hotels with their surrounding out-buildings are the most prominent objects in the view. **Watch Hill.**

The southern shores of Little Narragansett Bay are formed entirely by **Napatree Beach**, which is simply a strip of sand about a hundred and fifty yards wide and covered with wire grass, extending between **Watch Hill** and **Napatree Point**.

Vessels should not attempt to enter Little Narragansett Bay without a pilot.

GENERAL REMARKS

FOR VESSELS INTENDING TO ENTER LITTLE NARRAGANSETT BAY.

No stranger, however light his draught, should attempt to enter Little Narragansett Bay. The channel from Fisher's Island Sound leads close under Windmill Point, (say about an eighth of a mile from it,) runs in a northeasterly direction towards the southwestern end of Elihu's Island; then turns to the eastward, passing between that island and Rhodes' Folly; then gradually turns to the southeastward, passing to the northward of the red buoy on *Sandy Point Flats*; then to the southward, giving the eastern side of Sandy Point a berth of about half a mile to the eastward until the black buoy on *Denison's Rocks* is reached. It passes about one hundred yards to the southward of this buoy; then turns to the eastward and runs for about the middle of the entrance to Pawcatuck River,—giving the spindle on the end of *Pawcatuck Point Reef* a berth to the northward of about an eighth of a mile. Four feet at low water can be taken as far as Pawcatuck Point. In Pawcatuck River ten feet at low water may be carried through a very narrow channel as far up as Graves Neck; but it is usual for vessels to keep the middle of the river, in which case they will not have more than seven feet at low water. Above Graves Neck the channel is good for ten feet to about three hundred and fifty yards above the village of Lottery. Here a bar with two feet has to be crossed, which prevents all navigation except at high water.

MYSTIC RIVER.

This river empties into Fisher's Island Sound between Mason's Point on the east and Morgan's Point on the west. Navigation extends as far as the town of Mystic, a little over two miles above the mouth.

Mason's Point is the southern end of Mason's Island, already described on page 311 as lying in the mouth of the river on the north side of Fisher's Island Sound. The point is low, flat, covered with grass, and comparatively bold-to,—the Northern Passage leading close under it,—and twelve feet at mean low water may be found within fifty yards of the point. Between this point and Morgan's Point the distance is one mile; but three-fourths of this width is occupied by the extensive Mason's Island Flats.

Morgan's Point, the western point of entrance to this river, is the southern extremity of the peninsula upon which is built the village of Noank. On approaching it, it will appear low and rocky with a little grass on top, and a white dwelling, surmounted by a low tower, a little way back from the pitch of the point. The land to the northward rises gradually to a grassy summit with many bare ledges cropping out over its surface, and the village of Noank will be seen on its eastern slopes. (See also page 312.) Morgan's Point Light-house shows a fixed white light, of the sixth order, from a height of sixty-one feet above the sea, visible eleven miles. Its geographical position is

Latitude ----- 41° 18' 57" N.
Longitude ----- 71° 59' 23" W.

The lantern rises from the centre of the keeper's dwelling.

The western shores of Mystic River above Morgan's Point are composed of gently sloping lands covered with grass, and showing many bare ledges on their eastern slopes. Five-eighths of a mile above the point is the village of Noank, which is, however, of little importance. The channel runs close along the western shore. Nearly a mile above the point the western bank makes an abrupt turn to the westward nearly a quarter of a mile, then runs due N. for half a mile, and then about SE. for three-eighths of a mile, thus forming a large but shallow cove of no importance. Its western shores are composed of gently sloping grassy land crowned with a thick growth of trees, while its eastern bank shows flat grass land dotted with houses. From this cove to Portersville, a mile and an eighth to the northward, the shore is all flat near the river, but is backed by higher lands dotted here and there with clumps of trees. It is much cut up by coves and small indentations and is quite flat in its approaches,—the channel requiring very careful navigation.

Off the mouth of the cove above mentioned and abreast of the middle of Mason's Island lies a marsh island of irregular shape, about three-eighths of a mile long in an E. and W. direction and a width at its eastern end of six hundred yards. By it the width of the river is diminished at this point,—the channel passing about midway between it and Mason's Island with not less than three fathoms.

The eastern shores of Mystic River are formed, as before mentioned, by Mason's Island, and show marsh and grass land alternated, except at the northwestern end of the island, where there is a grassy hill between sixty and seventy-five feet high known as *Mason's Hill*. Between this hill and Spence Point, on the western bank, the river is only about three hundred yards wide.

Willow Point is on the western bank, about a quarter of a mile above *Spence Point*. Both are low, level and grassy. On the northern side of Mason's Island the river spreads away into a large shallow cove of very irregular shape, which penetrates the land in a northeasterly direction for nearly a mile. An arm of this cove running to the southward separates Mason's Island from the mainland, but is crossed and closed to navigation by a causeway.

The eastern shores of the river above Mason's Island are composed of marsh land backed by a hilly country, which is for the most part grassy or under cultivation. The settlement of **Mystic Bridge** occupies this bank about two miles and a half above Morgan's Point and nearly seven-eighths of a mile to the northward of Mason's Hill. A draw-bridge about one hundred and fifty yards long connects this village with **Portersville**,—a small settlement on the western bank, situated at the base of **Pequot Hill**. This hill rises with a gentle slope to a height of one hundred feet and is crowned with a thick growth of trees.

Above **Mystic Bridge** both banks of the river show flat, marshy and grassy lands near the shore, dotted with occasional houses. On the eastern bank the flat lands are backed by higher ground, gently sloping, with a level summit about sixty feet high, and entirely under cultivation. The exception to this is about half a mile below the town of **Mystic**, where a steep wooded hill rises from the flat lands about a quarter of a mile back from the river.

On the western bank the hills are all steep and thickly wooded, with bare ledges cropping out here and there.

At the head of the river, two miles above **Mystic Bridge** and four miles and a half above **Morgan's Point**, is the town of **Mystic**, situated on the eastern bank. It is of little importance, most of the business being conducted at **Mystic Bridge**, which is celebrated particularly for its ship-building,—its coastwise steamships, especially, being noted for their speed and the beauty of their build.

The great drawback to **Mystic River** is its narrow and crooked channel, which renders it dangerous of navigation by sailing vessels.

DANGERS

IN APPROACHING AND ENTERING MYSTIC RIVER.

I. *From the Eastward, having come through the Main Channel of Fisher's Island Sound.*—**Ram Island**, which lies in **Fisher's Island Sound** off the mouth of the **Mystic**, is surrounded by shoals except on its eastern side. About six hundred and fifty yards to the southeastward of it lies **Ram Island Reef**, which is the first danger met with on approaching **Mystic River** by this channel from the eastward. It is a detached reef, bare at low water, and surrounded by shoals which extend in a southeasterly direction nearly to the buoy, which is a red can* of the second class, marked No. 14, and placed in eighteen feet water four hundred yards S. by E. $\frac{1}{2}$ E. from the shoalest part of the reef. It bears from

Ram Island Reef.

	Miles.
Eel Grass Light-vessel, W. $\frac{3}{8}$ S.-----	1 $\frac{1}{4}$
Latimer's Reef spindle, W. $\frac{1}{2}$ N. Northerly-----	1 $\frac{3}{4}$
Young's Rock buoy, NW. by W. $\frac{1}{8}$ W.-----	1 $\frac{3}{8}$ nearly
The northern end of East Clump, NW.-----	1 $\frac{3}{4}$ nearly

From this buoy the red spar-buoy on **The Sweeper's Ground** bears W. by N. $\frac{7}{8}$ N., nearly a mile, and **Morgan's Point Light-house** NW. by N., nearly a mile and an eighth distant, and is in range with the southwestern end of **Ram Island**.

On leaving the **Main Channel** and turning to the northward to enter the river a red spar-buoy will be seen to the eastward of the course, bearing about N. by E. and half a mile distant. This is on **The Sweeper's Ground**, an eight feet shoal about half a mile to the westward of the southwestern end of **Ram Island**. The buoy is marked No. 16, placed in twelve feet on the southwestern end of the shoal, marking also the eastern side of the entrance to **Mystic River**. It bears from **Ram Island Reef** buoy W. by N. $\frac{7}{8}$ N., nearly a mile; from **Ram Island Reef** spindle W. by N., nearly seven-eighths of a mile; and from the southwestern end of **Ram Island** W. by S. $\frac{1}{2}$ S., a little over half a mile distant. From this buoy **Morgan's Point Light-house** bears NNE., five-eighths of a mile distant.

The Sweeper's Ground.

When up with the buoy on **The Sweeper's Ground** a spar-buoy, painted white and black in perpendicular stripes, will be seen about three hundred yards to the westward, bearing about WNW. This buoy is in eleven feet water and is intended to mark the sailing-line for vessels from the westward. Another spar-buoy, also painted black and white, will be seen on the eastern side of the channel, bearing NE. by E. and about six hundred yards off.

This latter buoy also marks the best water in the channel (eleven feet) and likewise serves as a guide in avoiding **Ram Island Flats**. These form a mass of shoal ground composed of flats and ledges, some of which are bare at all times, others only at low water, and some having from two to three feet upon them. A small bare islet, about a hundred yards long, lies near the western edge of these flats, about three hundred and fifty yards to the westward of **Ram Island** and between six and seven hundred yards to the southward of **Morgan's Point**. These flats extend along the whole of the western face of the island and join the long reef which extends from its northern end towards **Mason's Point**. The sailing-lines pass to the westward of them.

Ram Island Flats.

When abreast of the perpendicularly-striped buoy to the westward of **Ram Island Flats** an iron spindle, painted red and surmounted by a square cage, will be seen a little to the eastward of the course, bearing about NE. $\frac{1}{2}$ E. and a quarter of a mile off. This is on **Whale Rock**, a mass of loose boulders about twenty yards in diameter and bare at low tides, which lies on the western edge of **Ram Island Flats** and two hundred yards to the south-

Whale Rock.

ward of Morgan's Point. The channel passes to the westward of it, and leads to the northeastward past Morgan's Point and between a red spar-buoy on the east and a black spindle abreast of Morgan's Point Light-house on the west.

The red buoy, which is marked No. 2, indicates the extreme northwestern limits of Ram Island Flats, which here extend more than a quarter of a mile to the westward of the island,—the channel at this point being but little over a hundred yards wide. The spindle is known as Crook's Spindle, rises from a granite base and is surmounted by a keg. It is built upon the eastern end of the shoal making off to the eastward from Morgan's Point and bears from the light-house E. by S., nearly two hundred yards distant.

When past Crook's Spindle the channel keeps close along the western shore to avoid Mason's Island Flats, which make in a southwesterly direction from Mason's Island for nearly three-quarters of a mile, occupying almost the entire width of the river and leaving a channel only about one hundred and fifty yards wide between their western end and the Noank shore. They have from three to five feet upon them at mean low water and their extremity is marked by a pile.

It is not safe for strangers to attempt to ascend this river above Noank. A pilot can always be obtained either at this village or at the light-house.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING MYSTIC RIVER.

I. From the Eastward, having come through the Main Channel of Fisher's Island Sound.—

On the W. $\frac{1}{4}$ N. course through the Sound, when Morgan's Point Light-house bears N. by E. $\frac{3}{4}$ E. and North Hammock Light-house W. by S. $\frac{1}{4}$ S., the depth will be ten fathoms, and a N. course will lead, with not less than three and a half fathoms, to abreast of the red buoy on The Sweeper's Ground. When past this buoy and in about fourteen feet, with Eel Grass Light-vessel bearing E. $\frac{1}{2}$ S. Southerly and the spindle on Groton Long Point Reef W. $\frac{1}{2}$ S., NE. $\frac{1}{2}$ N. will lead, with not less than twelve feet, to the spindle on Whale Rock. Passing to the westward of this spindle, (in four fathoms,) when you are exactly between it and Morgan's Point Light-house, having the former bearing S. and the latter N., steer about NE. by E. $\frac{3}{4}$ E., aiming to pass about midway between Crook's Spindle and the red buoy on the northwestern side of Ram Island Flats. On this course you will not have less than four fathoms. When between the spindle and the buoy turn to the northward, giving the former a berth to the westward of about fifty yards, and then keep the western shore of the river close aboard (say about seventy-five yards off) until past Noank and nearly up with the southern point of entrance to the large cove making into the western shore just above that village. At this point the channel turns abruptly to the eastward, running directly for the middle of Mason's Island, with the summit of the wooded hill on that island a little to the southward of the course. When within about two hundred yards of the island the channel turns abruptly to the northward, passing about midway between Mason's Island and the marsh island off the western shore and leading directly for Willow Point. When abreast of the southern end of Mason's Hill it again turns more to the eastward, passing about one hundred yards to the westward of the northwestern point of the island. When within about a quarter of a mile of the southern end of Portersville a stake or spindle, maintained by private enterprise, will be seen a little to the eastward of the course. The channel passes about one hundred yards to the eastward of this and then leads directly towards the line of wharves in Portersville.

Strangers, however, should on no account attempt to pass beyond Crook's Spindle, but should take a pilot at Morgan's Point or before entering the river.

The above courses pass about two hundred yards to the westward of the red buoy on The Sweeper's Ground; about fifty yards to the westward of the spindle on Whale Rock; one hundred yards to the westward of the red buoy on the northwestern end of Ram Island Flats; the same distance to the eastward of Crook's Spindle; and one hundred and fifty yards to the westward of the southwestern end of Mason's Island Flats.

Or, a vessel of light draught may, when on the W. $\frac{1}{4}$ N. course the red buoy on the southern end of Ram Island Reef bears NE. by N. $\frac{1}{4}$ N., Morgan's Point Light-house N NW., and Eel Grass Light-vessel E. by N. $\frac{1}{4}$ N., steer NW. $\frac{3}{4}$ N., which will lead, with not less than ten feet, between The Sweeper's Ground and Ram Island Flats and up with the perpendicularly-striped buoy off the western end of the latter. When up with this buoy, with Morgan's Point Light-house bearing N NE., N NE.

Easterly will lead, with not less than fourteen feet, past the spindle on Whale Rock. *Sailing Directions--Mystic River.* When exactly between this spindle and Morgan's Point Light-house, having the latter bearing **N.** and the former **S.**, the depth will be four fathoms, and **NE.** by **E.** $\frac{3}{4}$ **E.** should be steered, following the directions for the river previously given.

The above courses pass a quarter of a mile to the westward of the red buoy on the southern end of Ram Island Reef; the same distance to the eastward of the red buoy on The Sweeper's Ground; one hundred yards to the westward of the western end of Ram Island Flats; and fifty yards to the westward of the spindle on Whale Rock.

Or, from Eel Grass Light-vessel steer W. by N. Northerly for the southwestern end of Ram Island, carrying not less than twelve feet, until within two hundred and fifty yards of it, when pass to the southward of the island about one hundred yards and steer **W NW.**, which will lead, with not less than nine feet, to the perpendicularly-striped buoy off the western end of Ram Island Flats. When up with this buoy steer **N NE. Easterly**, as before, and follow the previous directions.

The above courses pass three hundred and fifty yards to the northward of Ram Island Reef spindle; one hundred yards to the northward of the "six feet shoal" to the northward of Ram Island Reef; and fifty yards to the southward of the southern edge of Ram Island Flats. This channel should not, however, be attempted by strangers.

DANGERS

IN APPROACHING AND ENTERING MYSTIC RIVER.

II. From the Eastward by the Northern Passage.—This channel, although buoyed, should never be attempted by strangers. It may be entered from Stonington by passing between White Rock and Red Reef, to the northward of Ellis' Reef and Ram Island, and between the southern end of Mason's Island Flats and the northern end of Ram Island Flats. Or, from the Main Channel, it may be entered by passing to the eastward of Ellis' Reef and then to the northward of it, joining the sailing-lines from Stonington at the black buoy to the northward of Ram Island. That portion of the channel which lies between Ram Island and Morgan's Point is so narrow and crooked that no intelligible directions can be given; and a mere mention will, therefore, be made of the dangers and their marks.

If coming from Stonington, after passing Wamphassuck Point, **White Rock** will be seen a little to the southward of the course; and to the northward, bearing about **W.** $\frac{3}{4}$ **N.**, five-eighths of a mile off, a red spar-buoy. This is on **Red Reef**, a small detached rock, with two feet at low water, lying about three hundred and fifty yards to the northward of White Rock. The buoy is marked No. 10 and placed on the southern side of the reef.

A little over half a mile to the westward of Red Reef is a group of bare rocks surrounded by shoals and known as **Cormorant Reef**. Their southern end is about a quarter of a mile **E.** $\frac{1}{4}$ **S.** from Bush Island and five-eighths of a mile **W.** by **N.** $\frac{1}{2}$ **N.** from White Rock. The sailing-line passes well to the southward of them. When abreast of these rocks a black spar-buoy will be seen to the southward of the course about five hundred yards off; and a black spindle with square cage about three hundred yards to the southward of it. The spindle is on the dry part of Ellis' Reef and the buoy is placed in eleven feet off its northern end. Ellis' Reef is a small detached shoal, dry at low water, about five-eighths of a mile **S.** $\frac{1}{2}$ **W.** from the southern end of Dodge's Island and nine hundred yards **SE.** $\frac{1}{8}$ **E.** from the southern end of Baker's Island. The sailing-line by this channel passes one hundred and fifty yards to the northward of the buoy.

When past Ellis' Reef buoy the channel turns to the westward, leading about midway between Mason's Point and the northern end of Ram Island; and when abreast of the southern end of Baker's Island a black spar-buoy will be seen directly ahead and half a mile off. This is on the northern end of the Shoal Ground **N.** of Ram Island, which is formed by a line of sunken rocks extending in a northeasterly direction for two hundred yards from the northernmost of the rocky islets to the northward of the island. The buoy, which is marked No. 3, is placed in three fathoms off the northern end of the reef and bears from the black buoy **N.** of Ellis' Reef **W.** $\frac{5}{8}$ **N.**, seven-eighths of a mile distant. From this buoy Morgan's Point Light-house bears **W.** $\frac{1}{4}$ **S.**, nearly three-quarters of a mile distant.

When past the buoy **N.** of Ram Island the southern edge of the channel is marked by piles; but these are sometimes carried away and mariners must not depend upon them. There is a pile placed on the northwestern edge of *Ram Island Flats* and another on the southwestern end of *Mason's Island Flats*. These two are almost always in position, marking the northern and southern limits of the channel, and can be distinctly seen when abreast of the black buoy **N.** of Ram Island.

After passing the pile off the southwestern end of Mason's Island Flats the channel leads nearly for **Crook's Spindle**, which you may approach safely within sixty yards and then steer up into the river.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING MYSTIC RIVER.

II. *From the Eastward by the Northern Passage.*—A vessel from Stonington, bound to Mystic and wishing to pass to the northward of White Rock, may bring Stonington Light-house to bear **E. $\frac{1}{2}$ N.** and steer **W. $\frac{1}{2}$ S.**, which course will lead, with not less than twelve feet, between White Rock and Red Reef, past Cormorant Reef, Bush and Baker's islands. When abreast of the southern edge of Baker's Island the black spar-buoy off the **N.** end of Ram Island will be seen a little to the southward of the course and half a mile off. The course must now be changed so as to pass a little to the northward of this buoy; and when abreast of it **W. $\frac{3}{4}$ S.** will lead, with not less than ten feet, into the river, steering nearly for Crook's Spindle, which will be seen a little to the northward of the course and open a little to the southward of Morgan's Point Light-house. When within sixty yards of the spindle, **N.** by **W. $\frac{1}{4}$ W.** will lead, with not less than fifteen feet, past the southwestern end of Mason's Island Flats; after which the western shore of the river must be kept up to Noank.

The above courses pass one hundred yards to the southward of Wamphassuck Point Reef; the same distance to the northward of White Rock; two hundred yards to the southward of the buoy on Red Reef; nearly three hundred yards to the southward of Cormorant Reef; two hundred yards to the northward of the black buoy **N.** of Ellis' Reef; nearly three hundred yards to the southward of Bush Island Point; a little over one hundred yards to the southward of Baker's Island; close-to, to the northward of the black buoy **N.** of Ram Island; one hundred yards to the northward of the pile on the northwestern end of Ram Island Flats; about sixty yards to the southward of the pile on the southwestern end of Mason's Island Flats; and the same distance to the eastward of Crook's Spindle.

Or, wishing to pass to the southward of White Rock, you may bring Stonington Light-house to bear **E. $\frac{3}{4}$ N.** and steer **W. $\frac{3}{4}$ S.**, which will lead directly towards Ellis' Reef spindle. On this course, when abreast of White Rock, having it bearing **N. $\frac{3}{4}$ W.** and an eighth of a mile off, steer **W. $\frac{1}{2}$ N.** towards Morgan's Point Light-house, which will lead, with not less than three fathoms, up to the black buoy **N.** of Ellis' Reef. Pass to the northward of this buoy and steer **W. $\frac{3}{4}$ N.**, which will lead, with not less than fourteen feet, to the black buoy **N.** of Ram Island. Round this buoy to the northward, close-to, steer **W. $\frac{3}{4}$ S.** and follow the directions previously given.

Or, having come through the Watch Hill Passage.—On the **W. $\frac{3}{4}$ N.** course, when Stonington Light-house bears **N.** by **W.** and you have just passed Napatree Point Ledge buoy, steer **NW.** by **W. $\frac{1}{2}$ W.**, which will lead, with not less than three fathoms, past Ellis' Reef; and, with not less than twelve feet, to the black buoy (No. 1) **N.** of that reef. When up with this buoy pass about fifty yards to the northward of it, (in fifteen feet,) when you are in the Northern Passage and **W. $\frac{3}{4}$ N.** will bring you to the black buoy **N.** of Ram Island; after which follow the directions for that passage, given above.

This course, from the Main Channel into the Northern Passage, passes three hundred yards to the southwestward of Napatree Point Ledge buoy; nearly a quarter of a mile to the westward of The Middle Ground buoy; between six and seven hundred yards to the eastward of the Eel Grass Ground; and an eighth of a mile to the northeastward of the spindle on Ellis' Reef.

DANGERS

IN APPROACHING AND ENTERING MYSTIC RIVER.

III. *From the Westward, having come through the Main Channel of Fisher's Island Sound.*—In approaching Fisher's Island Sound from the westward the first danger met with will be seen well to the northward of the course, bearing about **NE. $\frac{3}{4}$ E.** and distant one mile. It is known as Sea-Flower Reef (sometimes called *Potter's Reef*) and lies almost exactly in the middle of the western entrance to the Sound,—being a mile to the southwestward of Mumford's Point and about a mile and a quarter to the northward of Northwest Point. There is equally good water on all sides of this reef; but the Main Channel passes to the southward of it,—that to the northward being known as the Pine Island Channel and used only by vessels bound to and from New London. A large granite beacon, supporting a spindle and barrel-shaped cage, is placed upon the western side of the reef and should not be approached from the southward

nearer than three hundred yards. This beacon bears from Bartlett's Reef Light-vessel **E. $\frac{7}{8}$ N.**, a little over four miles and a half distant, and from it

	Miles.
The spindle on Groton Long Point Reef bears E. by N. $\frac{1}{4}$ N. -----	1 $\frac{3}{8}$
The red buoy on Horse-Shoe Reef NE. $\frac{1}{2}$ N. -----nearly	$\frac{3}{4}$
North Hammock Light-house SE. Southerly -----over	$\frac{3}{4}$

But little over five-eighths of a mile to the eastward of Sea-Flower Reef the course turns to the northeastward, running about **NE. by E.**; and there will soon be seen, to the northward of the course, bearing about **NE. $\frac{3}{4}$ N.** and half a mile distant, an iron spindle close in with Groton Long Point. The spindle is painted red and surmounted by a cage in the form of an inverted cone. It marks the southern extremity of Groton Long Point Reef, which extends to the southward from Groton Long Point for two hundred yards and is bare at low water. Vessels may pass within one hundred yards of it with not less than sixteen feet at low water; but those using this channel do not approach nearer than three hundred yards.

Groton Long Point Reef.

When up with Groton Long Point a perpendicularly-striped buoy will be seen a little to the northward of the course, bearing about **NE.** and six hundred and fifty yards off; and a red spar-buoy to the eastward of the course, bearing about **E. by N. $\frac{1}{2}$ N.** and half a mile distant. The former is a channel buoy, in eleven feet water; but vessels usually pass to the eastward of it, as the best water is about midway between it and the red buoy. The latter is on The Sweeper's Ground, an eight feet shoal about half a mile to the westward of the southwestern end of Ram Island. The buoy is marked No. 16, placed in twelve feet on the southwestern end of the shoal, and marks the eastern limits of the channel at this point. It bears from

The Sweeper's Ground.

Groton Long Point spindle, E. $\frac{1}{4}$ S. -----	about 1100 yards.
Sea-Flower Reef Beacon, E. $\frac{3}{4}$ N. Northerly -----	1 $\frac{1}{8}$ miles.
North Hammock Light-house, NE. by E. -----	1 $\frac{5}{8}$ "

From this buoy Morgan's Point Light-house bears **N NE.**, five-eighths of a mile distant.

On coming abreast of the perpendicularly-striped buoy above mentioned another spar-buoy, similarly painted, will be seen a little to the southward of the course, bearing about **E NE.** and three-eighths of a mile off. This is also a channel buoy, but being placed off the southwestern end of Ram Island Flats vessels usually pass to the westward of it. Ram Island Flats is the name common to all that mass of ledges and flats which extends to the westward from Ram Island. Some of them are bare at all times, others only at low water, and some have from two to three feet upon them. A bare islet about one hundred yards long lies near the western edge of these flats, about three hundred and fifty yards from Ram Island and between six and seven hundred yards to the southward of Morgan's Point. By passing to the westward of the channel buoy and steering up between Morgan's Point Light-house and Whale Rock spindle they are avoided. (See also page 339.)

Ram Island Flats.

Whale Rock (the spindle upon which will be visible a little to the eastward of the course when you are up with the channel buoy off Ram Island Flats) is a mass of loose boulders about twenty yards in diameter and bare at low tides. It lies on the western edge of Ram Island Flats, two hundred yards to the southward of Morgan's Point; and the channel passes to the westward of it, leading to the northeastward past Morgan's Point and between a red spar-buoy on the east and a black spindle abreast of the light-house on the west. The red buoy, which is marked No. 2, is on the *northwestern end of Ram Island Flats*, which here extend more than a quarter of a mile to the westward of the island, the channel at this point being but little over one hundred yards wide. The spindle is known as **Crook's Spindle**, rises from a granite base and is surmounted by a keg. It is built upon the eastern end of the shoal making to the eastward from Morgan's Point, and bears from the light-house **E. by S.** nearly two hundred yards distant.

Whale Rock.

When past this spindle the channel keeps close along the western shore to avoid Mason's Island Flats, which make in a southwesterly direction from Mason's Island for nearly three quarters of a mile, occupying almost the entire width of the river, and leaving a channel only about one hundred and fifty yards wide between their western edge and the Noank shore. A pile is placed on their southwestern extremity to mark the eastern limits of the channel at this point. From three to five feet is found upon these flats at mean low water.

Mason's Island Flats.

Strangers should not attempt to ascend Mystic River above Noank. A pilot can always be obtained either at this village or at the light-house.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING MYSTIC RIVER.

III. *From the Westward, having come through the Main Channel of Fisher's Island Sound.*—
 Being about one hundred yards to the southward of Bartlett's Reef Light-vessel (in Long Island

Sailing Directions--Mystic River. Sound) steer **E. $\frac{3}{4}$ N.**, which course will lead into Fisher's Island Sound with not less than four and a quarter fathoms, passing between Sea-Flower Reef Beacon and North Hammock, but nearer to the latter. When just past North Hammock, having the light-house bearing **S. by E.**, about four hundred yards off, Morgan's Point Light-house will bear **NE. $\frac{1}{2}$ E.** and the depth will be fifteen fathoms. Now steer **NE. by E.**, which will lead, with not less than twelve feet, to abreast of the perpendicularly-striped buoy off the southwestern end of Ram Island Flats. When abreast of this buoy, in twelve feet water, having Morgan's Point Light-house bearing **NE. by N. $\frac{3}{4}$ N.** and the southwestern end of Ram Island **E. by S. $\frac{3}{4}$ S.**, steer **NE. $\frac{1}{2}$ N.**, carrying not less than twelve feet, until you are exactly between Morgan's Point Light-house and the spindle on Whale Rock, having the former bearing **N.** and the latter **S.** Now steer about **NE. by E. $\frac{3}{4}$ E.**, aiming to pass about midway between Crook's Spindle and the northwestern side of Ram Island Flats. On this course you will have not less than four fathoms. When between the spindle and the buoy turn to the northward, giving the former a berth of about fifty yards to the westward, and then keep the western shore of the river close aboard (say about seventy-five yards off) until up with Noank, where you should take a pilot.

The above courses pass three hundred yards to the northward of North Hammock; about nine hundred yards to the southward of Sea-Flower Reef Beacon; three hundred and fifty yards to the southeastward of the spindle on Groton Long Point Reef; one hundred yards to the eastward of the channel buoy **E.** of Groton Long Point; three hundred yards to the northwestward of the red buoy on The Sweeper's Ground; one hundred yards to the westward of the channel buoy off the southwestern end of Ram Island Flats; about fifty yards to the westward of the spindle on Whale Rock; one hundred yards to the westward of the red buoy on the northwestern end of Ram Island Flats; fifty yards to the eastward of Crook's Spindle; and one hundred and fifty yards to the westward of the pile on the southwestern end of Mason's Island Flats.

DANGERS

IN APPROACHING AND ENTERING MYSTIC RIVER.

IV. From the Westward, by the passage to the Northward of Sea-Flower Reef.—In entering by this passage the first danger met with is **Sea-Flower Reef**, already described on page 342. The sailing-line passes to the northward of it, and when abreast of it there will be seen well to the northward, off the mouth of Mumford's Cove and about five-eighths of a mile off, a red spar-buoy. This is on **Horse-Shoe Reef**, a dangerous shoal three hundred yards long **N NE.** and **SSW.** and bare in places at low spring tides. The buoy, which is marked No. 18, is placed in four fathoms off its southern end, and bears from

Sea-Flower Reef Beacon, NE. $\frac{1}{2}$ N. -----	nearly	Miles.
Bartlett's Reef Light-vessel, E. by N. $\frac{1}{2}$ N. -----		5 $\frac{1}{8}$
Bluff or Mumford's Point, S. by E. $\frac{1}{4}$ E. -----		3 $\frac{1}{8}$

From this buoy North Hammock Light-house bears **S. $\frac{1}{2}$ E.**, a mile and an eighth, and the spindle on Groton Long Point Reef **E. by S.** Southerly, seven-eighths of a mile distant.

When to the eastward of Horse-Shoe Reef the next danger met with is **Groton Long Point Reef**, on the northern side of the channel; which, together with all the dangers met with in the river, has been fully described on the preceding page.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING MYSTIC RIVER.

IV. From the Westward, by the passage to the Northward of Sea-Flower Reef.—Being about one hundred yards to the southward of Bartlett's Reef Light-vessel (in Long Island Sound) steer **E. by N. $\frac{1}{2}$ N.**, which course will lead, with not less than five and a half fathoms, to the northward of Sea-Flower Reef. On this course, when North Hammock Light-house bears **S. by E. $\frac{1}{2}$ E.** Nearly and the southeastern extremity of Groton Long Point **E. by N.**, the depth will be four and three-quarter fathoms, and an **E.** course will lead safely past Groton Long Point with not less than four and a half fathoms. When the spindle on Groton Long Point Reef bears **NW. $\frac{1}{4}$ N.**, nearly four hundred yards, and Morgan's Point Light-house **NE.**, nearly one mile distant, steer **NE. by E.** and follow the directions for the river given above.

The above courses pass an eighth of a mile to the northward of Sea-Flower Reef Beacon; six hundred and fifty yards to the southward of the red buoy on Horse-Shoe Reef; an eighth of a mile to the southward, and four hundred yards to the eastward, of the spindle on Groton Long Point Reef.

CURRENTS IN FISHER'S ISLAND SOUND.

In the Watch Hill Passage the current of flood sets nearly in the direction of the channel, though with a slight tendency to the northward, while the ebb shows the same tendency to the southward. Neither current will materially affect the sailing courses.

Near Eel Grass Light-vessel the current of flood has a tendency to the southward of W., while the ebb runs nearly due E.,—the average velocity being but little over a mile an hour.

Off Groton Long Point the flood sets nearly W., while the ebb has a tendency to the southward of E.,—the latter having a velocity of nearly a mile and a half.

In the Main Channel, to the northward of Wicopasset, the flood runs about NW. $\frac{1}{2}$ W. and the ebb nearly SE. $\frac{1}{2}$ E., with a velocity of two miles an hour.

Off East Harbor the flood runs W. $\frac{1}{2}$ S. and the ebb E. $\frac{1}{2}$ N., while between Horse-Shoe and Sea-Flower reefs the flood runs nearly WNW. and the ebb ESE., with a velocity of two miles an hour.

In the Catumb and Sugar Reef passages the tidal current sets nearly at right angles to the axes of the channels; and these passages should, therefore, not be attempted by strangers.

The following table will show the set and drift of the current at those positions in the Sound where observations have been made by the Coast Survey:

TABLE.

No.	STATION.	Second Quarter.		Third Quarter.		Flood or Ebb.
		Set.	Drift.	Set.	Drift.	
1	Between Gangway Rock and Sugar Reef	W. by N. $\frac{1}{2}$ N.	1.17	WNW.	1.20	Flood.
		E. by S. $\frac{1}{2}$ S.	1.25	E. by S. $\frac{1}{2}$ S.	1.10	Ebb.
2	Near Eel Grass Light-vessel	W. $\frac{1}{2}$ S.	1.22	W. by S. $\frac{1}{2}$ S.	1.12	Flood.
		E. $\frac{1}{2}$ N. Northerly	1.05	E. $\frac{1}{2}$ N. Northerly	1.25	Ebb.
3	Off Groton Long Point	W. $\frac{1}{2}$ N.	1.18	W.	1.22	Flood.
		SE. by E. $\frac{1}{2}$ E.	1.11	E. by S. $\frac{1}{2}$ S.	1.43	Ebb.

ICE AND ITS EFFECTS IN FISHER'S ISLAND SOUND.

Except in severe winters this Sound is not much obstructed by ice. What there is generally comes from Long Island Sound,—being part of the drift-ice from that Sound which is driven north of Fisher's Island by westerly winds. During heavy winters the great masses of drift-ice in passing to the eastward separate near Bartlett's Reef,—a part passing out through The Race into Block Island Sound and the rest being forced into Fisher's Island Sound, completely closing navigation. With milder weather and strong westerly winds it is soon broken up and passes out into Block Island Sound through the Watch Hill Passage.

The harbors in the Sound are, of course, closed to navigation in such winters.

LONG ISLAND SOUND.

This extensive body of water lies between the shores of Connecticut and New York on the north and Long Island on the south and is between eighty and ninety miles long. It is widest about midway of its length, (say on a line between Branford Harbor and Herod's Point,) where it is over sixteen miles in width, and from this point gradually diminishes towards its eastern and western ends. At its eastern entrance, between Fisher's Island and Plum Island, it is about six miles and a half wide; while at its western extremity, between Throg's Neck and Willet's Point, (at its point of junction with the East River,) it is only three-quarters of a mile wide.

This Sound forms a most important part of the system of inland coast navigation to the eastward of New York,—four fifths of the coastwise trade between that city and the New England ports passing through it. The important harbors of New London and New Haven lie on its northern shore, together with many of the so-called "tidal" harbors, which latter, though not available for strangers, are much frequented by coasting vessels of light draught.

On the southern shore of the Sound lie the harbors of Greenport and Sag Harbor, (in Shelter Island Sound,) Huntington and Oyster Bay, Hempstead and Manhasset Bay,—all of which, with the exception of the last named, can be entered at low water by vessels drawing eighteen feet. Manhasset Bay is good for only thirteen feet at low water, and there is, besides, the "tidal" harbor of Port Jefferson, into which not more than three feet at low water can be taken.

Long Island Sound is singularly free from dangers throughout its entire length; affords ample room for beating to windward and good anchorage in adverse weather. The great drawback to its usefulness as a thoroughfare between New York and the Eastern States is the well-known and much dreaded passage of Hell Gate, (in the Narrows of the East River,) where the velocity of the current and the numerous sunken reefs and ledges have long been very great obstructions to navigation. Of later years, however, the increasing use of steam-power, and above all the energetic and liberal measures taken by the Government to remove the most dangerous of the sunken reefs, have much diminished the dangers of this passage, and there is little doubt that in the not distant future the Sound will become the highway for all vessels bound from New York to the eastward.

As above mentioned, the entrance to this Sound from the eastward is between Race Point (the western end of Fisher's Island) and Plum Island Point, (the eastern extremity of Plum Island.) Between these two points the entrance is six miles and a half wide; but the available channel is contracted to a width of three miles and a half by the Gull Islands, which lie nearly in a line between Plum Island and Race Point; and there is a very dangerous rock called Valiant Rock, almost exactly midway between Race Point and the Gull Islands. This main channel is known as The Race on account of the great velocity of the tidal current, which during ordinary tides runs at the rate of four miles an hour, and during spring tides has been known to reach a maximum velocity of over six miles.

Race Point, when seen from the eastward, will appear low, flat and sandy, with a line of boulders at its western end and a little grass on its summit. A hut of refuge will be seen near the beach, appearing as a low house of a dark-brown color. About half a mile to the southwestward of the point lies Race Rock,—the site of Race Rock Light-house.

Race Rock Light-house is an eight-sided granite tower rising from the roof of the keeper's dwelling, which is a one-story house with gable roof, and is also of granite. The lantern is painted black; and the light (which is shown from a height of sixty-eight and a half feet above the level of the sea) is of the fourth order of Fresnel, revolving red and white at intervals of thirty seconds with short periods of total eclipse, and visible fourteen miles. The fog-signal is a bell, struck by machinery twice in quick succession every twenty seconds during thick weather. The geographical position of this light-house is

Latitude	41° 14' 35" N.
Longitude	72° 2' 51" W.

It bears from

Point Judith Light-house, W. $\frac{3}{4}$ S.	26 $\frac{1}{2}$ Miles.
Block Island North Light-house, W. by N.	20 $\frac{1}{2}$
Montauk Point Light-house, NW. by N. $\frac{1}{2}$ N.	13 $\frac{1}{2}$

From this light-house

New London Light-house bears N. by W. $\frac{3}{4}$ W.	4 $\frac{1}{2}$ Miles.
Bartlett's Reef Light-vessel NW. by W. $\frac{1}{2}$ W.	4
Cornfield Point Light-vessel W. $\frac{1}{2}$ N.	15 $\frac{1}{2}$
Little Gull Island Light-house SW. by W. $\frac{1}{2}$ W.	3 $\frac{1}{2}$
Gardiner's Island Light-house SW.	7 $\frac{1}{2}$

On the western side of the entrance lie the Gull Islands, known as Great Gull and Little Gull. The latter, which is the easternmost, is very small and low, and is easily recognized by the light-house and keeper's dwelling. It is surrounded by shoals and there is no passage between it and Great Gull Island, which lies three-eighths of a mile to the westward. This latter is half a mile long ENE. and WSW., with low and nearly level surface, covered only with grass, and shows sandy faces here and there. Near its eastern end it is somewhat higher and perfectly flat on top, with steeply sloping faces covered with grass,—giving it the appearance of an earth-work. Between this island and Plum Island there is a passage about a mile and three-quarters wide with from three to six fathoms in it, but obstructed by the dangerous ledges known as Old Silas and Bedford Reef, which lie nearly in the middle of the passage.

Little Gull Island Light-house, when seen from the eastward, will appear as a granite tower connected with a red dwelling,—both elevated on a protecting pier, also of granite. The tower is seventy-four feet high and shows a fixed white light, of the second order, from a height of ninety-two feet above the sea, visible seventeen miles. Its geographical position is

Latitude	41° 12' 21" N.
Longitude	72° 6' 26" W.

It bears from

Point Judith Light-house, W. $\frac{1}{2}$ S.	30 Miles.
Block Island North Light-house, W. $\frac{1}{2}$ N.	23 $\frac{1}{2}$
Montauk Point Light-house, NW. $\frac{1}{2}$ W.	14
Watch Hill Light-house, W. by S. $\frac{1}{2}$ S.	12 $\frac{1}{2}$
Race Rock Light-house, SW. by W. $\frac{1}{2}$ W.	3 $\frac{1}{2}$

From this light-house

Gardiner's Island Light-house bears SW. by S. $\frac{1}{2}$ S.	about 4 $\frac{1}{2}$ Miles.
New London Light-house N. by E. $\frac{1}{2}$ E.	about 6 $\frac{1}{2}$
Bartlett's Reef Light-vessel N. $\frac{1}{2}$ W.	a little over 3 $\frac{1}{2}$
Cornfield Point Light-vessel W. by N. $\frac{1}{2}$ N.	12 $\frac{1}{2}$

The fog-signal at this light-house is a steam fog-siren of the second order, (in duplicate,) giving blasts of five seconds intervals of forty seconds.

Plum Island, the westernmost and largest of the islands lying in the eastern entrance to the Sound, is of a very irregular shape and a little over two and a half miles long in an ENE. and WSW. direction. When seen from the eastward it appears of moderate height, with rolling surface covered with grass, and precipitous sandy faces at intervals along its southeastern shore. Near its eastern end it appears to be separated into two islands.



U.S. GEOLOGICAL SURVEY

WATER RESOURCES DIVISION

Report of Investigations No. 10, Part 1, Plate 1, Figure 1

Water in Long Island Sound from the Experiment, Cell 1, and Cell 2, during W. N. Adams's 1871

Exp. No. 1, 1871

U.S. GEOLOGICAL SURVEY

WASHINGTON, D. C.

1872

a perpendicular cliff descending to the beach from what appears to be the western end of the eastern island. This sharp division line is very perceptible six miles off and by it the island is easily recognized.

Plum Island Point, the eastern extremity of this island, is composed of low grassy land, with a very gentle rise. To the westward the land is still lower and almost level, forming a continuous plain extending to the foot of Brown's Hills. The land is grassy and two or three houses are seen.

Brown's Hills are the highest land on the island. They lie on its northern side, about a mile and a half to the westward of Plum Island Point and a mile to the eastward of Light-house Head,—the western extremity of the island. They are very prominent, and in 1877 the highest summit was marked by a large tripod erected by the Coast Survey. There are no trees on these hills,—their summits being bare or covered only with grass. **Brown's Hills.**

Light-house Head, the western extremity of Plum Island, is easily recognized by the large granite dwelling on its summit, surmounted by a lantern. This is Plum Island Light-house, and is used principally as a guide to Plum Gut and Gardiner's Bay. The head is a sandy bluff, about forty feet high, with rolling surface, covered with grass, and perpendicular water-worn faces, at the base of which lie innumerable boulders. The light-house is erected on top of the keeper's dwelling, which is a two and a half story granite house; and the light shown is a revolving white light, of the fourth order, seventy-six feet above the level of the sea, and visible fourteen miles. The interval between the flashes is thirty seconds. The geographical position of the light-house is **Plum Island Light-house.**

Latitude ----- 41° 10' 23" N.
Longitude ----- 72° 12' 43" W.,

and it bears from Bartlett's Reef Light-vessel SW. $\frac{1}{2}$ S., six miles and five-eighths distant. From this light-house

	Miles.
Saybrook Light-house bears NW. $\frac{1}{2}$ N. -----	8 $\frac{1}{2}$
Cornfield Point Light-vessel NW. by W. $\frac{1}{2}$ W. -----	8 $\frac{1}{2}$
Falkner's Island Light-house W. by N. $\frac{1}{2}$ N. -----	nearly 20

The fog-signal at this light-house is a bell struck by machinery at intervals of fifteen seconds.

The Northern Shores of Long Island Sound begin at Bluff or Mumford's Point, the northern point of the western entrance to Fisher's Island Sound. On the western side of this point is formed a cove about a mile wide, in which anchorage in from two to three fathoms may be found during northerly winds. The northern shore of this cove is formed by a flat sand beach, terminating to the westward in a narrow flat point with a few trees on it. This point is known as Bushy Point, and is the southern point of entrance to a narrow and shallow stream called Poquonock River, at the head of which and about two miles above the entrance is the small village of Poquonock. Another small stream, known as Baker's Cove, also penetrates the land to the northward just inside of Bushy Point; but neither of these is of any commercial importance. **Bushy Point.**

Close to Bushy Point—its eastern end being only one hundred yards distant—lies Pine Island, which gives the name to the Pine Island Channel leading from Fisher's Island Sound into New London Harbor. It is easily recognized by the long, low, black-looking clump of woods with a slight depression in the centre, which is on its eastern end. The other half of the island is bare of trees and has several houses upon it. The Pine Island Channel leads between this island and Black or Southeast Ledge, on which there is a beacon surmounted by a spindle and cage. The channel is here about four hundred yards wide. **Pine Island.**

Three hundred yards to the northwestward of Pine Island lies Avery's Point, the eastern point of entrance to the Thames River and New London Harbor. It is a low grassy point, nearly level and under cultivation, and has several houses on it. On its northern side makes in a small shallow cove,—the northern point of which is called Eastern Point, and is low, rocky, with nearly level surface, covered with grass, and has several houses close to the shore-line. A little way back from the point is a thick growth of low bushy trees. **Avery's Point.**

The entrance to New London Harbor is seen on the western side of Avery's Point,—the western side of the entrance being marked by a white tower attached to a grey dwelling-house. This is New London Light-house, on Light-house Point, which is low and rocky and backed by low thick woods. Several small houses are also seen in the vicinity of the light-house. Both banks of the river near the entrance are cleared and settled, and the shore rises with a gentle slope to higher wooded lands in the distance. The city of New London is seen on the western bank about two miles above the light-house, and opposite to it the village of Groton on the eastern bank, situated at the base of high steep hills, on the summit of one of which is a very tall monument looking like a chimney. This is Groton Monument, on the site of ancient Fort Griswold, and is the most prominent object seen on approaching the harbor. **New London Light-house.**

New London Light-house is a white tower, eighty-five feet high, attached to the keeper's dwelling, which is painted drab. It shows a fixed white light, of the fourth order, from a height of ninety feet above the sea, visible fifteen miles. Its geographical position is

Latitude ----- 41° 18' 58" N.
Longitude ----- 72° 5' 24" W.,

and it bears from

	Miles.
Race Rock Light-house, N. by W. $\frac{1}{2}$ W. -----	4 $\frac{1}{2}$
Little Gull Island Light-house, N. by E. $\frac{1}{2}$ E. -----	6 $\frac{1}{2}$
Bartlett's Reef Light-vessel, NE. $\frac{1}{2}$ N. -----	nearly 3 $\frac{1}{2}$

A third-class fog-trumpet, giving blasts of six seconds at intervals of fourteen seconds, is placed close to the light-house.

A mile and a half to the southwestward of Light-house Point is Goshen Point,—the land between them being nearly level and showing cleared and cultivated fields alternating with groves of trees. Goshen Point, like the shore in its vicinity, is low and nearly level, covered with grass, and backed by a thick grove of low trees. It is shoal in its approaches,—the dangerous **Goshen Reef** extending from it to the southward for nearly a mile. There is, however, a narrow and crooked passage, through which about ten feet may be carried between the shoalest part of this reef and the point; but it is entirely unfit for strangers and is used only by the small fishermen of the neighborhood.

From Goshen Point to the westward the shore runs nearly **W. by N.** for a mile and three-eighths and then turns to the northward to the mouth of **Whitestone Creek**, on which is situated the village of **Waterford**, about a mile and three-quarters above the mouth. All of this shore is low and nearly level, highly cultivated and thickly settled. The cultivated fields are dotted with clumps of low woods, and a line of trees on the higher lands in the background closes the view.

Off the mouth of **Whitestone Creek** and three-quarters of a mile **SE. by S.** from **Millstone Point** lies **Two Tree Island**,—a low flat island, about one hundred and fifty yards long in a **N.** and **S.** direction, and surrounded by dangerous shoals; and about eight hundred yards to the eastward of this and a mile and a quarter **W. $\frac{1}{2}$ S.** from Goshen Point is the northern extremity of a very dangerous reef, known as **Bartlett's Reef**, which extends about **S. by E.** for a mile and a quarter and

Bartlett's Reef and Light-vessel. has many rocks upon it bare at low water. About eight hundred and fifty yards **S. $\frac{1}{2}$ E.** from the southern end of the reef and half a mile **SE. $\frac{1}{2}$ E.** from its southwestern end is placed a light-vessel, called **Bartlett's Reef Light-vessel**, which is the principal guide to **Fisher's Island Sound** from the westward. It is a two-masted vessel, painted black, with a white streak, and the words "*Bartlett's Reef*" in large letters on each side. In day-time it shows two circular day-marks, and at night two fixed white lights, from a height of twenty-eight feet above sea-level, visible ten miles. The approximate geographical position of this light-vessel is

Latitude	-----	41° 15' 38" N.
Longitude	-----	72° 7' 35" W.,

and it bears from

	Miles.
North Hammock Light-house, W. $\frac{1}{2}$ S. -----	5
Race Rock Light-house, NW. by W. $\frac{1}{2}$ W. -----	4
Little Gull Island Light-house, N. $\frac{1}{2}$ W. -----	3 $\frac{1}{2}$

From this light-vessel

	Miles.
New London Light-house bears NE. $\frac{3}{4}$ N. -----	nearly 3 $\frac{1}{2}$
Plum Island Light-house SW. $\frac{1}{2}$ S. -----	6 $\frac{1}{2}$
Cornfield Point Light-vessel W. $\frac{1}{2}$ S. -----	12
Saybrook Light-house W. $\frac{1}{2}$ N. -----	9 $\frac{1}{2}$

A bell is struck and a horn sounded on this vessel during thick weather.

On the western side of the entrance to **Whitestone Creek** is **Millstone Point**, the eastern point of entrance to **Niantic Bay**. It is low, level and grassy, and has several houses upon it. The land behind it forms the eastern shore of the bay, and is composed of cultivated fields dotted with houses and clumps of trees.

Niantic Bay. **Niantic Bay** is a large indentation in the northern shore of the Sound, about a mile and a half long, with an average width of a mile and a quarter. At its head it receives the waters of **Niantic River**,—a small and very shallow stream of no importance. The bay itself has good anchorage in from twelve to twenty-one feet and is easily entered in day-time,—the few shoals in it being carefully buoyed.

Black Point. **Black Point**, the western point of entrance to **Niantic Bay**, is a little over two miles **W SW.** from **Millstone Point**, and is occupied entirely by cultivated fields backed by a large grove of trees. The southern extremity of the point is quite low and sandy; but about a hundred yards to the northward the land rises rather abruptly to a level surface about twenty feet high, which is occupied by the cultivated fields above mentioned. It is comparatively bold-to and may be safely approached within a quarter of a mile with not less than twenty-one feet at low water.

Pattaguansett River. On the western side of **Black Point** empties **Pattaguansett River**,—a small shallow stream of no importance, leading up to the settlement of **Niantic**. It is half a mile wide at its mouth, but the available channel is diminished to a width of about one hundred yards by a number of marshy islets surrounded by flats. Of these islets the northernmost, called **Bluff Island**, lies in the middle of the river about a mile to the northward of **Black Point**. It is about a quarter of a mile in diameter and has a grove of trees on it. The next largest of these islets is called **Griswold's Island**, and lies a little over three-quarters of a mile **NW.** from **Black Point** and three hundred yards to the southwestward of **Bluff Island**. It is about three hundred and fifty yards long and covered entirely with marsh. There are several other and much smaller islets in the group; and what appears, when seen from a distance, to be another marsh island, about three hundred and fifty yards in diameter, close to the western side of **Black Point**. It is, however, connected by a narrow strip of sand beach with the mainland. A group of three small islets, known as **The Black-boys**, is the southernmost of the line of islands off **Pattaguansett River**. They lie three-quarters of a mile **NW. $\frac{1}{2}$ W.** from the southern extremity of **Black Point**; and there is a dangerous ledge, known as **Black-boy Rock**, and bare at low water, four hundred yards to the southward of them.

Two miles and a half **W. ½ N.** from Black Point lies Hatchett's Point, which is low and grassy, covered with cultivated fields and backed by thick woods. On its eastern side and a mile to the westward of the mouth of Pattaquansett makes in **Four Mile River**, which leads up to the village of **South Lyme**. Between the two rivers the shore is composed of gently sloping lands, partly under cultivation and partly wooded, and intersected by narrow valleys composed of salt-meadow. That portion of the cultivated land which lies on the western bank of the Pattaquansett is known as **Grant's Neck**. Hatchett's Point is shoal and should not be approached nearer than three-eighths of a mile. So also with the large bay contained between it and Black Point and into which the Pattaquansett and Four Mile rivers empty. It is full of shoals and dangerous rocks and strangers must not attempt to enter it. **Hatchett's Point.**

From Hatchett's Point the north shore about **W. ½ N.** for two miles and three-quarters to New Breach or **Griswold's Point**, the eastern point of entrance to the **Connecticut River**. This part of the shore shows low and nearly level lands, for the most part highly cultivated and well settled and dotted with groves of trees. It is foul **New Breach Point**, and must not be approached by vessels passing through the Sound nearer than a mile and a quarter. New Breach Point is a long, low, narrow and marshy point of land faced by sand beach, which extends out from the mainland in a nearly **W NW.** direction for half a mile.

Just to the westward of New Breach Point will be seen a strip of white sand beach, apparently extending into the middle of the river. This is **Poverty Island Beach**, the southern extremity of Poverty Island,—a marshy island a mile and a quarter long, lying close to the eastern bank of the river, from which it is separated by a narrow and shallow stream called **Back River**. The beach is the only firm ground upon it and is sufficiently remarkable when seen from the bar. **Poverty Island.**

The western extremity of Poverty Island Beach is called **Poverty Point**.

Between New Breach Point and Poverty Island is a shallow passage an eighth of a mile wide, leading into **Griswold's Cove**, **Blackhall River** and **Back River**. The first mentioned is contained between New Breach Point and Blackhall Point, which separates it from Blackhall River. This latter point is formed by low and level land, cultivated and settled and showing somewhat steep faces to the southward. The small settlement of **Blackhall** is situated on this point, about three-eighths of a mile back from the river. **Blackhall Point.**

The western point of entrance to the river is called **Lynde's Point**; and between it and New Breach Point the mouth of the river is a mile wide. More than half of this width, however, is occupied by flats. Lynde's Point is low and nearly level, and at its eastern extremity bare; but to the westward the land is somewhat higher, dotted with houses, and has a large hotel upon it, which is the most prominent object, with the exception of the light-house, seen on approaching the river. **Lynde's Point.**

The light-house, which is called **Saybrook Light-house**, stands upon the eastern extremity of the point, and will appear as a tall white tower with yellow dwelling-house at its base and a bell-frame of open-work close by. The tower is sixty-four feet high and shows a fixed white light, of the fourth order, from a height of seventy-three feet above the sea, visible fourteen miles. Its geographical position is **Saybrook Light-house.**

Latitude ----- 41° 16' 18" N.
Longitude ----- 72° 20' 37" W.,

and it bears from

	Miles.
Bartlett's Reef Light-vessel, W. ½ N. -----	9½
Race Rock Light-house, W. by N. ½ N. -----	13½
Little Gull Island Light-house, NW. by W. ½ W. -----	11½
Plum Island Light-house, NW. ½ N. -----	8½

The open-work tower near the light-house contains the **fog-signal**, which is a bell struck by machinery at intervals of twelve seconds.

In approaching **Connecticut River**, or in passing its mouth either to the eastward or westward, **Saybrook Point** and the village of **Saybrook** will be seen on the west bank about three-quarters of a mile above Lynde's Point. The point will appear low and nearly level, with a few trees at intervals and thickly dotted with houses,— **Saybrook Point.** forming the eastern suburbs of the village. The village itself is situated a little over a mile inland, and its thickly clustered houses will appear over the low land of **Lynde's Neck**. Several wharves will be seen jutting out from the eastern face of **Saybrook Point**.

From Lynde's Point the northern shore of the Sound has a general course **W. ½ S.** for a little over two miles to **Cornfield Point**. The country is low and nearly level, entirely under cultivation, and has perpendicular sandy faces to the southward. It is also somewhat foul and should not be approached nearer than eight hundred yards.

Guard-House Point, nearly a mile and a quarter to the westward of Lynde's Point, shows perpendicular sandy faces, and is occupied by cultivated lands backed by woods and marsh.

Cornfield Point is low and sandy, with nearly level surface and perpendicular faces,—at the base of which innumerable boulders are seen. It is covered only with a scanty growth of grass. A little over two miles to the southward of this point will be seen a sloop-rigged light-vessel, known as **Cornfield Point Light-vessel**. It is placed on the southern side of an extensive and dangerous shoal, called **Long Sand Shoal**, which lies **E. and W.**, at a distance from the northern shore of nearly two miles, and though quite narrow is five miles and a **Cornfield Point and Light-vessel.**

quarter long. There is a good channel, known as the **North Channel**, between it and the northern shore; but the **Main Channel** passes well to the southward of it. The light-vessel is painted red, with the words "*Cornfield Point*" on each side in white letters. It is moored in seven and a half fathoms about an eighth of a mile from the southern edge of the shoal, shows in daytime a square cage day-mark painted red; and at night a fixed red light from a height of forty feet above the sea, visible twelve miles. Its geographical position is (approximately)

Latitude ----- 41° 13' 32" N.
Longitude ----- 72° 23' 17" W.,

and it bears from

	Miles.
Saybrook Light-house, SW. $\frac{1}{4}$ W. -----	3 $\frac{1}{4}$
Plum Island Light-house, NW. by W. $\frac{3}{4}$ W. -----	8 $\frac{1}{4}$
Little Gull Island Light-house, W. by N. $\frac{1}{4}$ N. -----	nearly 13
Race Rock Light-house, W. $\frac{1}{4}$ N. -----	15 $\frac{1}{4}$
Bartlett's Reef Light-vessel, W. $\frac{1}{4}$ S. -----	12

From this light-vessel Falkner's Island Light-house bears W. $\frac{1}{4}$ N., twelve miles; and Horton's Point Light-house SW. by S. $\frac{1}{4}$ S., nearly nine miles distant.

A bell is rung and a horn sounded during thick weather.

At Cornfield Point the shore makes an abrupt turn to the northward for about a mile to the mouth of **Oyster River**; and thence to the westward to the mouth of **Menunketesuck River**. Thus is formed a large bay, or, properly speaking, two coves, in which from six to twelve feet may be found, with fair holding ground in northerly, easterly and westerly winds. The shore from Cornfield Point to the mouth of **Oyster River** and for half a mile beyond that river is composed entirely of marsh, with cultivated and settled country in the background; but at this point the cultivated land extends to the water's edge,—forming a low and nearly level point, called **Old Kelsey's Point**, which marks the dividing line between the two coves,—that to the westward being known as **Westbrook Harbor**. The northern shore of this harbor is formed by low, level and cultivated land to within three-quarters of a mile of the mouth of **Menunketesuck River**, where marshy land takes its place. The river is of no importance,—being a mere shallow stream, which divides just inside its mouth, sending one branch to the northward and the other (commonly known as **Westbrook River**) to the northeastward to the village of **Westbrook**, which lies about three-eighths of a mile inland and through the centre of which the stream runs. The village is plainly visible from the harbor.

The western point of **Westbrook Harbor** and the southern point of entrance to the river is called **Menunketesuck Point**, and is low, nearly level and grassy, with sandy faces protected by a line of boulders. A single small white house stands upon this point near its southern end, and the point itself, which extends in a southeasterly direction for about five-eighths of a mile, forms a natural breakwater, protecting **Westbrook Harbor** from westerly winds.

The land in the background to the northward of **Menunketesuck Point** is much higher than that near the shore and is thickly wooded.

About five-eighths of a mile to the southwestward of **Menunketesuck Point** lies a low grassy islet called **Duck Island**. It is very similar to the point in appearance, having perpendicular faces and being surrounded by boulders. Shoal water extends in every direction from this island, but it is boldest to on its western side, where it may be approached within an eighth of a mile with not less than fifteen feet. A narrow passage, through which twenty feet may be carried at low water, leads between **Menunketesuck Point** and this island; but it is not safe for strangers.

A little over two miles to the westward of **Menunketesuck Point** is **Kelsey's Point**; and between the two is formed a large semicircular cove, called **Duck Island Harbor**, in which anchorage is found in from eight to eighteen feet at low water. It is entirely unobstructed and vessels may enter it with safety by passing between **Duck Island** and **Kelsey's Point**. The shores of this harbor are for the most part marsh and grass, backed by nearly level cultivated lands.

Kelsey's Point is flat and grassy, with steep faces, and terminates to the southward in a bluff rocky head about thirty feet high, with bare ledges cropping out over its surface and an old dilapidated dwelling upon it. When seen from the eastward low thick woods appear behind the point; and in the distance high hills, one of which presents a remarkable appearance, as if the summit and middle part were composed of bare sand, while the rest is wooded. **Kelsey's Point** must not be approached from the southward nearer than three-quarters of a mile. This point is also sometimes called **Saul's Point**.

About six hundred yards to the westward of **Kelsey's Point** and an eighth of a mile from the northern shore lies a mass of bare rock, called **Stone Island**. It is two hundred and fifty yards long NNE. and SSW., and its greatest width (which is about seventy-five yards) is midway between its northern and southern ends. The northern end of this island bears WSW. from **Kelsey's Point**, distant nearly six hundred yards, and its southern end SW. by W. $\frac{1}{4}$ W. from the same point, distant seven hundred and fifty yards. Rocky ledges with less than six feet at low water surround it, extending to the northward one hundred and fifty yards and to the southward seventy-five yards. There is a passage for vessels of six feet draught between this island and the mainland; but it is not available for strangers. **Stone Island Ledge** makes off to the southward from the island for about four hundred yards with less than twelve feet water; and there is a good channel (though unsuitable for strangers) between it and the northern end of **Stone Island Reef**.

On the western side of Kelsey's Point is Killingworth Harbor,—a cove about three-quarters of a mile wide but very shallow, which receives the waters of Hammonasset and Indian rivers. Not more than two feet at low water can be taken to the mouth of the latter, on the banks of which is situated the village of Clinton. The shores of the harbor are for the most part marsh, except in the neighborhood of Clinton, which village lies amid level lands finely cultivated. This anchorage is not considered good except for very small vessels and strangers should never attempt to enter it.

**Killingworth
Harbor.**

Hammonasset Point, the western point of entrance to the harbor, is a mile and a half to the westward of Kelsey's Point, and is low and grassy with somewhat undulating surface, terminating in a bluff,—the steep faces and base of which are strewn with boulders. There is a group of old unpainted houses on this bluff. The point is shoal and should not be approached by large vessels nearer than five-eighths of a mile.

At Hammonasset Point the land turns abruptly to the northward (running about NW. for about two miles and a quarter) and then to the westward, having a general course about W. $\frac{1}{2}$ N. for three miles and a half to the entrance to Guilford Harbor. The village of Madison is built about half a mile inland and about midway between Hammonasset Point and Guilford Entrance. The land near the shore is low and nearly level and under high cultivation, with dense woods in the background.

A small rocky islet, called Tuck's Island, lies off this shore at a distance of between three and four hundred yards and two miles and three-quarters NW. by W. $\frac{1}{2}$ W. from Hammonasset Point. It is noticeable for the peculiar white rocks on its southern face and the clump of thick bushy trees on its eastern end,—the western end being bare. At low water this island is joined to the mainland. Several wharves are seen to the northwestward of the island and between seven and eight hundred yards from it, affording accommodation to the few vessels which trade to Madison.

Tuck's Island.

Hogshead Point lies a mile and a quarter to the westward of Tuck's Island and a little over four miles NW. by W. $\frac{1}{2}$ W. from Hammonasset Point. It is low and level and occupied entirely by cultivated fields. Indeed the whole of this shore is beautifully cultivated and thickly dotted with houses. In the distance will be seen a remarkable looking hill with nearly level summit, but terminating to the eastward in a bluff precipitous head. This is Mount Carmel.

Hogshead Point.

From Hogshead Point to the entrance to Guilford Harbor the shore is marshy, but backed by cultivated lands and thick woods.

Guilford Harbor is situated about five miles to the westward of Hammonasset Point and a little over two miles from Madison. It is formed by a large but shallow cove nearly a mile wide at its mouth, and which receives the waters of a very small, narrow and crooked stream called East River. Another, and smaller stream, leads from the western side of the harbor to the town of Guilford, which is situated about three-quarters of a mile inland, but whose suburbs extend to the northern shore of the harbor. All the land near the shore-line is marshy except a small portion on its northern side, where the wharves are built and upon which there are a number of houses.

Guilford Harbor.

Guilford Harbor is entirely unfit for strangers. Its larger portion is occupied by flats with from one to four feet water upon them; and it has besides many sunken ledges and dangerous shoals. Its western point of entrance is called Mulberry Point. It is low, rocky and nearly level, bare of trees and faced with innumerable boulders; and there are also many outlying rocks off the point. On its western side is formed a small shallow cove about three-eighths of a mile long in a N. and S. direction and with from two to five feet in it at low water. It is not, however, a safe anchorage and is never used. There are so many outlying and dangerous reefs off Mulberry Point that it is not safe for large vessels to approach it nearer than three-quarters of a mile.

Mulberry Point.

Directly S. from the middle of the entrance to Guilford Harbor and bearing S. by E. $\frac{1}{2}$ E. from Mulberry Point, two miles and five-eighths distant, lies a remarkable looking islet called Falkner's Island. It appears, when seen from the eastward, as a grassy islet of moderate height, with steep sandy faces and smooth summit, and has near its centre a tall white light-tower with a dwelling-house attached, and a small wooden house, containing the fog-whistles, close to the tower. A couple of bushy trees (the only ones on the island) stand to the southwestward of the light-house. The southern end is lower than the northern end but partakes of the same general character.

Falkner's Island.

Falkner's Island is surrounded by shoal water. A reef of rocks, dry at low water, extends to the northward between seven and eight hundred yards, and within the lines of three fathoms the shoals extend to the northward nearly half a mile, to the eastward the same distance, and to the westward nearly a mile, uniting the island in the last-named direction with another small rocky island, also covered with grass, but surrounded by a reef of bare rocks. This is Goose Island, and lies seven-eighths of a mile W. $\frac{1}{2}$ S. from the light-house. There is a passage for vessels of less than twelve feet draught, between Falkner's Island and Goose Island, by keeping a quarter of a mile from the former.

Goose Island.

The southern side of Falkner's Island is comparatively bold-to,—four fathoms being found within two hundred and fifty yards of it.

Falkner's Island Light-house is an octagonal stone tower, forty-six feet high, painted white and attached to the keeper's dwelling. It shows a fixed white light, of the fourth order, (varied every minute and

**Falkner's Island
Light-house.**

half by flashes,) visible fifteen miles. The light is shown from a height of ninety-six feet above the sea and is one of the most prominent landmarks in going through the Sound. Its geographical position is

Latitude ----- 41° 12' 41" N.
Longitude ----- 72° 39' 14" W.,

and it bears from

	Miles.
Cornfield Point Light-vessel, W. $\frac{1}{4}$ N.	12
Plum Island Light-house, W. by N. $\frac{1}{4}$ N.	nearly 20
Horton's Point Light-house, NW. $\frac{1}{4}$ N.	12

From this light-house

	Miles.
New Haven Tower bears W. by N. $\frac{1}{4}$ N.	11 $\frac{1}{2}$
Stratford Point Light-house W. Southerly	20 $\frac{1}{4}$
Old Field Point Light-house SW. by W. $\frac{1}{4}$ W.	a little over 25

A ten-inch steam fog-whistle (in duplicate) gives blasts of eight seconds' duration at intervals of fifty-two seconds during thick weather.

The Southern Shores of Long Island Sound are formed exclusively by the northern side of Long Island, beginning with Oyster Pond Point,—the northeastern extremity of that island. Between this point and Plum Island is the wide and deep passage known as Plum Gut, leading into Gardiner's Bay, and thence to Shelter Island Sound and the Peconic bays. It has an average width of about a mile and a quarter, but the available channel is only about five-eighths of a mile wide,—the passage being obstructed by the long reef making off from Oyster Pond Point. There is plenty of water in the gut for vessels of the largest size; but the velocity of the tidal current is such that it is at times difficult to stem it unless with a very strong fair wind, and it is, therefore, not recommended to strangers.

Oyster Pond Point is the eastern extremity of that long peninsula of Long Island which separates the Sound from Great and Little Peconic bays. The point itself is low and level and is composed of sand, faced by a shingly beach and covered with grass. It is very rapidly wasting away by the action of the sea, which has advanced several hundred yards within the last forty years. To the westward of the extremity of the point the land gradually rises,—showing steep sandy faces to the northward,—and is occupied by cultivated fields, dotted with houses and occasional lone bushy trees. There is a large hotel, surmounted by a cupola, standing a little way back from the point and to the westward of it.

Mulford's Point lies a little over two miles to the westward of Oyster Pond Point and at the eastern extremity of the highest land on the neck, which is known as Brown's Hills. On its eastern side is a small cove of little importance, called Petty's Bight. The point itself is sandy, with precipitous faces and perfectly level surface, covered with grass. It is comparatively bold-to and may be approached within four hundred yards with not less than four fathoms water.

Brown's Hills are composed mainly of sand, in many places entirely bare of vegetation, in others covered with grass, and in others with low black-looking trees. Their northern faces (towards the Sound) are precipitous and composed entirely of yellow sand. Almost all of the eastern slopes are grassy and dotted with groves of low trees. The central hill, which is also the highest, is entirely bare, but was in 1877 surmounted by a tripod and staff, marking the site of the Coast Survey Signal at that point.

A little over a mile and a half W. by S. $\frac{1}{2}$ S. from Mulford's Point is Terry's Point, which is low, sandy, and faced with boulders at its extremity, but has a slight rise to the southward,—the higher lands being covered with grass. Over the low land of the valley, between this point and the foot of Brown's Hills, will be seen the thickly clustered houses in the village of Orient, which occupies the eastern shore of Orient Harbor, on the southern side of the peninsula. The point is comparatively bold-to and may be approached within an eighth of a mile with not less than four fathoms water.

Two miles to the westward of Terry's Point is Rocky Point, which is of moderate height, showing steep sandy faces to the northward and terminating in a flat sand beach strewn with boulders. A thin and scattered growth of trees dots the gentle slopes in the vicinity of the point, extending to the dense woods about half a mile back. Between this point and Terry's Point the land descends to a flat sand beach, dotted with houses and known as Truman's Beach.

At its narrowest part this beach is but an eighth of a mile wide, which width is all that separates Orient Harbor from the Sound. Good anchorage in from two to three fathoms is found in the bight off this beach in southerly winds; but the approach to it is obstructed by Orient Shoal, which has six feet water on it and is marked by a black buoy.

Rocky Point may be approached within two hundred yards with not less than five fathoms.

Inlet Point is a mile and three-quarters SW. $\frac{1}{4}$ W. from Rocky Point, and between the two the shore presents an almost unbroken line of steep sandy faces, terminating in a flat sand beach strewn with boulders. The land is slightly undulating, grassy, and partly under cultivation; and the houses in the village of Stirling will be visible just to the eastward of the point and about a third of a mile inland.

At Inlet Point the land is higher, with steep, almost perpendicular, faces about fifty feet high, descending to a beach covered with rocks. It should not be approached nearer than a quarter of a mile.

Westward from Inlet Point the shore turns more to the southward, running about **SW. $\frac{1}{2}$ S.** for a mile and a quarter, and then about **W. by S.** for three-quarters of a mile to Mulford's Point. The land is much lower than that in the vicinity of Inlet Point, but still shows perpendicular faces, skirted by a flat sand beach strewn with boulders. The country is well cultivated and thickly settled.

Mulford's Point is low and flat at its extremity; but about seventy-five yards back the land rises abruptly to a height of between twenty and thirty feet and the ground at its base is strewn with boulders. The name, **Hashamomuck Beach**, is given to that portion of the flat beach which stretches to the eastward and westward of **Mulford's Point**. From this point to Horton's Point the course of the shore is **W. $\frac{1}{2}$ S.** and the distance a mile and a half. The land gradually increases in height, still showing abrupt faces and backed by thick woods.

Horton's Point is five miles and a quarter **SW. by W. $\frac{1}{2}$ W.** from Rocky Point and almost directly opposite to Menunketesuck Point, (on the northern shore.) It is the northern extremity of **Horton's Neck**, has an undulating surface, between seventy and eighty feet high, with steep faces to the northward. The low lands to the southward of the point are diversified with thick woods and cultivated fields; but the greater portion of the wooded country cannot be seen until to the westward of the point, owing to the height of the latter. On the western slopes of the point, about seventy feet above high-water mark, stands Horton's Point Light-house, which will appear as a square white tower attached to a dwelling of the same color. It is thirty-five feet high, and shows a fixed white light, of the third order, from a height of one hundred and five feet above the sea, visible sixteen miles. Its geographical position is

Latitude 41° 5' 4" N.
 Longitude 72° 26' 46" W.,

and it bears from Saybrook Light-house **SW. by S. $\frac{1}{2}$ S.**, a little over twelve miles, and from Cornfield Point Light-vessel **SW. by S. $\frac{1}{2}$ S.**, nearly nine miles distant. From this light-house

	Miles.
Falkner's Island Light-house bears NW. $\frac{1}{2}$ N.	12
The entrance to New Haven Harbor NW. by W. $\frac{1}{2}$ W.	nearly 23
Stratford Point Light-house W. by N. $\frac{1}{2}$ N.	30
Old Field Point Light-house W. $\frac{1}{2}$ S. Nearly	31

Duck Pond Point is a little over four miles **SW. by W. $\frac{1}{2}$ W.** from Horton's Point, but the shore between them makes a curve to the southward and westward, running first **SW.**, for two miles and a quarter, to Goldsmith's Inlet, and then **W. by S.** **South-erly**, for about two miles, to Duck Pond Point. Between Horton's Point and Goldsmith's Inlet it is composed of a broad sand beach, (called **Horton's Beach**.) backed by higher lands covered with dense woods.

Goldsmith's Inlet is a mere stream, about one hundred yards wide at its mouth and of no importance. Between it and Duck Pond Point the shore is for the most part thickly wooded, showing steep almost perpendicular faces, descending to a level sand beach and having bare ledges cropping out at intervals along their whole length. **Goldsmith's Inlet**. This is a foul shore and should not be approached nearer than a mile and a quarter.

Duck Pond Point is somewhat higher than the land to the eastward but partakes of the same general character, except that the beach at its base is fringed with boulders. The land in its vicinity is nearly level, cleared and cultivated, and backed by thick woods. It should not be approached nearer than half a mile.

From Duck Pond Point to Jacob's Point the direction is **W. by S. $\frac{1}{2}$ S.** and the distance seven miles and a quarter. The shore is composed of a series of hills, intersected at long intervals by narrow gullies, and ranging in height from sixty to one hundred feet. These hills are for the most part thinly wooded, but the country back of them is highly cultivated and thickly settled. The Manor Hills are the easternmost of the range,—their eastern end being about a mile to the southwestward of Duck Pond Point. They are from sixty to eighty feet high, thinly wooded, with precipitous faces to the northward descending to a flat sand beach, and they extend about a mile and a quarter to the marshy land fringing the banks of **Mattituck Inlet**. This inlet, which leads into **Mattituck Pond**, is of little importance,—being very shallow and only two hundred and fifty yards in width at its mouth. With the low land surrounding it, it separates the Manor Hills from the Mattituck Hills on its western side. These hills form a range about a mile and a half long,—the highest, called **Cooper's Hill**, being over one hundred feet high. They are for the most part wooded but not quite so steep to the northward as the Manor Hills, and are faced by the usual sand beach. **Manor Hills.**

Joining them on the west is another range about a mile long and somewhat higher, called **Jacob's Hills**, which partake of the same general characteristics. At their base, to the westward, is a very small inlet known as **Luce's Landing**; and hence to Jacob's Point the land, though still hilly and undulating, is much lower and not so steep. **Mattituck Hills.**

Jacob's Point is between sixty and seventy feet high, with steeply sloping face to the northward, and terminating in the usual flat sand beach. It is bare of trees and shoal in its approaches, so that it must receive a berth of not less than a mile. It is directly opposite Falkner's Island, from which it is distant thirteen miles and a half, which is here the width of the Main Channel. **Jacob's Point.**

Roanoke Point is a mile and three-quarters **W. $\frac{1}{2}$ N.** from Jacob's Point,—the land between them presenting the same general features as that to the eastward,—the summits of the hills being thinly wooded and their northern faces somewhat steep, with bare ledges cropping out along their whole length. The sand beach which fringes the base of the hills has boulders scattered over it; and in this vicinity we find the first of the line of outlying **Roanoke Point.**

bare rocks, which are found in great numbers all the way to Mount Misery Point, at the entrance to Port Jefferson. A long shoal makes off to the northward from Roanoke Point and large vessels should not approach it nearer than a mile and three-quarters.

From Roanoke Point to Herod's Point the direction is *W. ½ N.* and the distance six miles and a quarter. The shore line is nearly straight,—making but a slight curve to the southward; and the shore itself has an undulating surface, for the most part wooded, with somewhat steep faces, descending on the north to a flat sand beach strewn with boulders.

Friar's Head. Friar's Head, the highest summit in this vicinity and one of the most prominent hills on the southern shore of the Sound, is about one hundred and thirty feet high, with steep faces to the northward showing many out-cropping ledges; and is visible, in clear weather, from off the southern coast of Long Island. There are many outlying rocks off this shore and strangers of large draught should not approach it nearer than two miles.

There are many boat landings on this beach between Roanoke and Herod's points at an average distance from each other of about a mile. Beginning at the eastward they are known as **Roanoke Landing**, just to the westward of Roanoke Point; **Friar's Head Landing**, at the base of Friar's Head, (nearly a mile and three-quarters to the westward of Roanoke Point;); **Jericho Landing**; **Fresh Pond Landing**; **Hulse's Landing**; and **Half-way Hollow Landing**;—the last named being a mile to the eastward of Herod's Point.

Herod's Point is about sixty feet high, with steep faces broken by outcropping ledges, and descending to a flat sand beach off which there are many outlying rocks. The summit is wooded. This point is foul in its approaches and **Herod's Point.** should not be approached from the northward nearer than two miles. It is nearly opposite to New Haven on the northern shore.

From Herod's Point to Rocky Point the distance is between five and six miles and the direction *W. ½ N.* The shore is pretty straight, (having but a slight curve to the southward,) and is very similar in appearance to the land to the eastward, showing steep faces with outcropping ledges, partly wooded and partly cleared, and gradually diminishing in height until within about a mile of Rocky Point, where the land is somewhat higher. The only break in the line of bluffs begins at **East Landing**,—a mile to the westward of Herod's Point, and is formed by the marshes fringing the banks of **Wading River**,—a narrow, crooked and shallow stream, which leads up to the village of **Wading River**, about half a mile inland. On the beach, at the western side of the entrance to this river, is **West Landing**; a little over half a mile to the westward of this is **Tuthill's Landing**; a little over a mile from Tuthill's is **Swezy's Landing**, which is easily recognized by the group of houses on the bluff; and the same distance to the westward of Swezy's is **Hallock's Landing**; all of which are of local importance only.

Rocky Point is about sixty feet high, but is divided in a *N.* and *S.* direction by a narrow valley running between the hills to the pitch of the point. A number of houses are seen at the head of the valley; and a road leads from these houses to the beach, at the point known as **Rocky Point Landing**. There are many outlying boulders off this point,—one of which, **The Old Sow**, is four hundred yards from shore. This part of the shore is very shoal and strangers should not approach it nearer than two miles.

From Rocky Point to Mount Misery Point the direction is *W.* by *N.* *Northerly* and the distance five miles and three-quarters. The bluffs still show steep faces, but vary in height from twenty to fifty feet: and their summits are partly wooded and partly under cultivation. From Rocky Point to **Woodhull's Landing**, a mile and a quarter to the westward, the summit of the bluffs is entirely cleared; while from Woodhull's to **Miller's Landing** they are mostly wooded. Miller's Landing is two miles and a half to the westward of Rocky Point and is the highest and steepest land between it and Mount Misery. There are many outlying boulders off this shore, especially in the vicinity of Woodhull's Landing; and it is by no means safe for strangers to approach the land anywhere between Rocky Point and Old Field Point nearer than a mile and a half.

Three-quarters of a mile to the westward of Miller's Landing and about three miles and a quarter from Rocky Point is the entrance to Mount Sinai Harbor, a shallow cove, full of flats and marsh islands,—the entrance to which is by a shallow inlet one hundred yards wide. The shore in this vicinity is a flat beach backed by marsh, and is known as **East Beach** on the eastern side and **West Beach** on the western side of the entrance. West Beach extends from the inlet nearly a mile, where it meets the higher wooded land of **Strong's Neck**; and thence to Mount Misery Point the distance is nearly a mile and a half in a *NW.* by *W.* direction.

Mount Misery Point is the northwestern extremity of a wooded hill about one hundred and eighty feet high, called Mount Misery; and is also the eastern point of entrance to Port Jefferson Harbor. It has a steep face, about twenty feet high, with outcropping bare ledges; and behind this the hill rises with a very gentle slope to a height of one hundred and eighty feet. It is faced by a flat sand beach on which are a few scattered boulders, and is directly opposite to Stratford Point, (on the northern shore.) The Sound is here between ten and eleven miles wide.

Port Jefferson Harbor is a cove of irregular shape making into the northern shore of Long Island for about a mile and a half in a *SE.* direction, with the village of **Port Jefferson** at its head. The entrance is very contracted,—being only about one hundred yards wide, with a depth at low water of three feet; but when once past the bar good anchorage is found in from two to five fathoms in a land-locked cove five-eighths of a mile wide.

The western side of the entrance to Port Jefferson Harbor is formed by a narrow strip of sand, called **Setauket Beach**, which extends in a *NW.* by *W.* direction nearly to Old Field Point; while the eastern side is guarded by another flat sand beach, extending about *W.* by *S.* from Mount Misery Point for seven hundred yards. There is but little trade at Port Jefferson; but it is connected with the northern shore of the Sound by a small steamboat which plies regularly between it and Bridgeport.

A little over a mile and a quarter to the northwestward of the entrance to Port Jefferson Harbor is Old Field Point, a long grassy point between thirty and forty feet high, faced by a sand beach and fringed with boulders. It is a little over thirty-one miles to the westward of Horton's Point and twenty-five miles from Falkner's Island. The land in its vicinity is low, nearly level, and under cultivation except on its western side near the shore, where there is a stretch of low woods for nearly three-quarters of a mile. The northern extremity of Old Field Point is the site of Old Field Point Light-house, which will appear as a white dwelling, two stories high, with a black lantern rising from its gable end. It shows a fixed white light, of the fourth order, from a height of seventy-nine feet above the sea, visible fourteen and a half miles. Its geographical position is

Old Field Point and Light-house.

Latitude ----- 40° 58' 34'' N.
 Longitude ----- 73° 7' 8'' W.,

and it bears from

	Miles.
Horton's Point Light-house, W. $\frac{1}{4}$ S.	about 31
Cornfield Point Light-vessel, W. by S. $\frac{3}{4}$ S.	a little over 36
Falkner's Island Light-house, SW. by W. $\frac{1}{4}$ W.	a little over 25
Southwest Ledge Light-house, SW. $\frac{1}{4}$ S.	17 $\frac{1}{2}$
Stratford Point Light-house, S. by W. Westerly	10 $\frac{1}{2}$
Stratford Shoal, or Middle Ground, Light-house, S. by W. $\frac{1}{4}$ W.	5

From this light-house

	Miles.
Bridgeport Light-house bears N. $\frac{1}{4}$ W.	11
Black Rock Light-house N. by W. $\frac{1}{4}$ W.	10 $\frac{1}{2}$
Penfield's Reef Light-house N. by W. $\frac{1}{4}$ W.	nearly 9 $\frac{1}{2}$
Norwalk Light-house NW. by W. $\frac{1}{4}$ W.	14 $\frac{1}{2}$
Great Captain's Island Light-house W. $\frac{1}{4}$ N.	23
Eaton's Neck Light-house W. $\frac{1}{4}$ N. Nearly	12 $\frac{1}{2}$

Five miles N. by E. $\frac{1}{2}$ E. from Old Field Point and nearly in the middle of the Sound will be seen a two-story grey stone house with pitch roof, supported upon a pier of dark-colored stone, and surmounted by an eight-sided low tower with lantern. This is Stratford Shoal or Middle Ground Light-house, and is built near the northern end of The Middle Ground. It shows a flashing white light from a height of sixty-three feet above high water, visible thirteen and a half miles. The light is of the fourth order of Fresnel, flashes once every ten seconds, and bears from

Stratford Shoal Light-house.

	Miles.
Southwest Ledge Light-house, SW. $\frac{3}{4}$ W.	13 $\frac{1}{2}$
Falkner's Island Light-house, W. by S. $\frac{3}{4}$ S.	a little over 22
Saybrook Light-house, W. by S.	36 $\frac{1}{2}$
Cornfield Point Light-vessel, W. $\frac{1}{4}$ S. Nearly	33 $\frac{1}{2}$
Horton's Point Light-house, W. $\frac{1}{4}$ N.	29 $\frac{1}{2}$

From this light-house

	Miles.
Stratford Point Light-house bears N. $\frac{1}{4}$ W.	5 $\frac{1}{2}$
Bridgeport Harbor Light-house N NW.	6 $\frac{1}{2}$
Black Rock Light-house NW. $\frac{1}{4}$ N.	a little over 7
Penfield's Reef Light-house NW. $\frac{3}{4}$ W.	6 $\frac{1}{2}$
Norwalk Light-house W. $\frac{1}{4}$ N.	a little over 14 $\frac{1}{2}$
Great Captain's Island Light-house W. $\frac{1}{4}$ S.	24
Eaton's Neck Light-house W. by S. $\frac{1}{4}$ S.	14 $\frac{1}{2}$

The fog-signal at this light-house consists of a Daboll trumpet, giving blasts six seconds long at intervals of twenty-one seconds, during thick and foggy weather.

On the Northern Shore of the Sound, about a mile to the southwestward of Mulberry Point, is a low, flat, rocky point with cleared surface, backed by woods; and on the western side of this point makes in a small shallow cove about half a mile wide, separating it from Sachem's Head, a smooth, gently sloping, rocky point, for the most part cleared, but in places fringed with a thin growth of trees and in others having small clumps of trees dotting the surface. It is almost entirely barren at its southwestern extremity, being covered with bare ledges. There is a small hotel about a quarter of a mile back from the shore, and around this a cluster of houses has collected. The point is shoal in its approaches and should receive a berth to the northward of not less than eight hundred yards.

Sachem's Head.

From Sachem's Head to Jeffrey's Point the direction is W. by N. and the distance five miles; but between these two points the shore curves to the northward and westward,—forming a large but shallow bay studded with islands and full of shoals. Strangers should never enter this bay,—the narrow channels in which are so crooked and full of rocks as to render any intelligible directions impossible.

A quarter of a mile to the northwestward of Sachem's Head is Joshua's Point; and between the two is a narrow cove about seven hundred yards long with an average width of two hundred yards, called Sachem's Head Harbor. Nine feet at low water can be taken into this harbor through a narrow channel leading close under the western side of the head. Its shores are all low, nearly level and cleared.

Joshua's Point is about forty feet high, with a very gentle slope and grassy surface, except on its northern side, where there is a thin fringe of trees. The shore is faced with steep bare rocks. The whole of the northern shore from this point to the westward is cut up by small shallow coves, off which lie many bare and sunken rocks and a labyrinth of

Hoadley's Point. Hoadley's Point, which lies nearly a mile to the northwestward of Joshua's Point, is composed of bare rocks backed by level grassy land, and this again by woods. To the westward of this point marsh land, alternating with low grassy land, extends for about a mile and a quarter to **Stony Point**, which is very similar in appearance to Hoadley's,—being composed of bare rocky ledges, backed by nearly level land partly cleared and partly cultivated. About midway between Hoadley's and Stony points is a flat rocky point known as **Flying Point**.

Brown's or Haycock Point. Three-eighths of a mile to the westward of Stony Point is Brown's or Haycock Point, which also terminates in bare rocky ledges; and thence to Jeffry's Point the shore is for the most part level and under cultivation, but with rocky faces and many outlying bare ledges. The background is formed by higher wooded lands; and when near Jeffry's Point portions of the village of **Branford** will be seen over the low shore.

All of the rocks fringing the shore between Joshua's and Jeffry's points have a peculiar yellow look, which gives them at a distance a sandy appearance; and these rocky faces are dotted at intervals with clumps of low black-looking trees

The islands which stud the whole of this bay are so numerous that it is impossible to give an intelligible description of any but the principal ones. They are for the most part rocky and covered with a bushy growth of low trees. The **Thimbles**, which form the principal group, are composed of about a dozen islets lying close together,—the centre of the group being about a mile and three-quarters to the westward of Joshua's Point.

The southernmost of these, which is known as **The Thimble**, is about three hundred yards long N. and S. and bare except for one or two bushy trees upon it. About one hundred yards to the southeastward of it lies a round bare rock called **The Outer Thimble**, and the sailing-line of the North Channel passes within one hundred and fifty yards of it. Next to the northward of **The Thimble** (say about two hundred yards NE. of its southern end) is a high rocky islet, between three and four hundred yards long, called **Horse Island**; and one hundred and fifty yards to the northeastward of this is **East Island**, very similar in appearance. Kidd's Islands—the southernmost of which is about three hundred yards N. of Horse Island

Kidd's Islands. and two hundred yards to the northwestward of East Island—are a group of four bare islets extending in a line about half a mile long in a NE. and SW. direction and close together. Between this group on the north, and East and Horse islands on the south, there is good and convenient anchorage in from fifteen to sixteen feet at low water, which is much resorted to by small vessels. About a hundred yards to the eastward of East Island is **Pot Rock Island**,—a mass of bare ledges; and about two hundred yards to the eastward of this is a bare ledge, nearly a hundred yards

High Island. in diameter, known as **Bush Ledge**. Three hundred yards to the northeastward of Pot Rock Island is High Island,—the northeasternmost of the group,—a nearly round rocky islet about one hundred and fifty yards in diameter, with steep faces and bare of trees. Between High Island and Pot Rock there is a very narrow channel through which eighteen feet may be taken as far as the anchorage, which is between the southern end of High Island and the northern end of Pot Rock, where from thirteen to twenty feet may be found, with soft bottom. Another rocky islet, about two hundred yards long in a N. and S. direction, lies one hundred and fifty yards to the southeastward of High Island and three hundred and fifty yards to the eastward of Pot Rock Island. It has a grassy surface and is bare of trees.

Three hundred and fifty yards to the eastward of High Island and nearly six hundred yards to the northwestward of Hoadley's Point is **Bare Island**,—a rocky islet about two hundred and fifty yards in diameter, bare of trees and surrounded by outlying boulders. **Little Bare Island** lies a hundred yards to the southward of it and is a mere mass of rocks.

Four hundred yards to the westward of Bare Island and two hundred yards to the northward of High Island lies another rocky islet with steep faces and grassy surface, and about three hundred yards long in an ENE. and WSW. direction. A narrow channel, through which fourteen feet at low water may be taken, leads between the Bare Islands on the east and High Island on the west, and in common with numerous other small channels winding among the labyrinth of islands is often resorted to by small vessels.

About two hundred yards to the northwestward of the northernmost of Kidd's Islands and four hundred yards to the southwestward of Flying Point is **Governor's Island**,—a rocky islet of irregular shape, with steep faces and bare of trees. It is about six hundred yards long ENE. and WSW., and at its widest part (where it sends off a spur to the eastward) it is a little over two hundred yards wide. There is no passage to the eastward of it, but there is good anchorage in from two to four fathoms between its northern end and Flying Point; and a passage with eleven feet at low water leads along the western side of Kidd's Islands to a comfortable anchorage between the eastern end of Governor's Island and the northernmost of these islands, in from two to three fathoms at low water. **Strangers**, however, should not attempt any of these passages.

Between five and six hundred yards to the northwestward of Governor's Island lies **Rodgers' Island**; and between the two and about two hundred yards from the former lies a bare rocky islet about three hundred yards long in an E. and W. direction. It has no name. **Rodgers' Island** is sometimes called **Round Island**, and is about three hundred yards to the southward of Stony Point. It is about two hundred and fifty yards in diameter, with steep rocky faces and nearly level summit, destitute of trees.

BUOYS

- Red Buoy to be left in entering on Starboard hand
- Black Buoy to be left in entering on Starboard hand
- Black and Red horizontal stripes - Danger Buoy
- Black and White perpendicular stripes - Channel Buoy

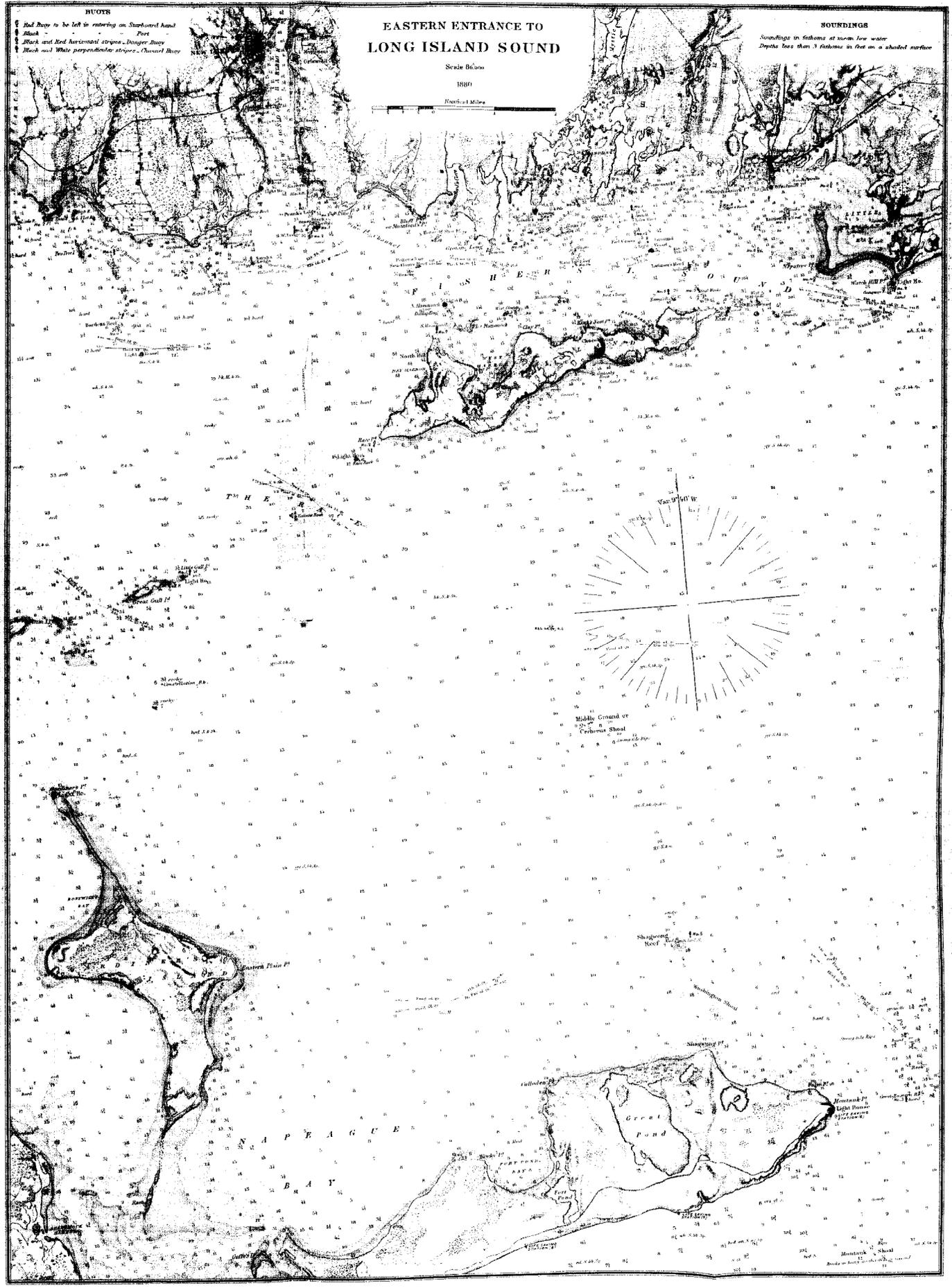
EASTERN ENTRANCE TO LONG ISLAND SOUND

Scale of Miles



SOUNDINGS

Soundings in fathoms at mean low water
Depths less than 3 fathoms in feet on a shaded surface



Of the numberless bare rocks and rocky islets scattered over the bay to the westward of those just described it is impossible to give any intelligible description,—the more so that but few of them are named; but on approaching Jeffrey's Point a number of larger islands are seen extending in a line from that point to the southeastward. Of these the easternmost and first met with is a mere mass of bare rock, extending **NE.** and **SW.** for four hundred yards, and is called **Ball Island.** It is two miles to the westward of Thimble Island and three-eighths of a mile from the western shore of the bay. About eight hundred yards to the southward of it is a mass of boulders known as **The Negro Heads**; and between the two there is a good channel with four fathoms water.

About three hundred yards to the northwestward of Ball Island is **Flagg Island**, also rocky, with steep faces, and bare of trees. It lies **NE.** and **SW.** and is about two hundred and fifty yards long.

About one hundred and fifty yards to the northward of Flagg Island and two hundred and fifty yards from the western shore lies **Squaw Island**,—a mass of bare rock, three hundred yards long in an **ENE.** and **WSW.** direction; and about one hundred and fifty yards to the westward of Flagg Island lies Spectacle Island, which is of such an irregular shape that no proper idea of its size can be given by description. It may be said, however, that its greatest **Spectacle Island.** length (**E.** by **N.** and **W.** by **S.**) is three-eighths of a mile, and that its width varies from twenty to two hundred yards. It is for the most part a mass of bare rock, although there is a scant growth of grass near its western end, where it is separated from Jeffrey's Point by a passage two hundred and fifty yards wide. From its northern end, at low water, a *long spit* extends to the northeastward a little over a hundred and fifty yards, joining the reef making out from the mainland.

Jeffrey's Point is low, flat and rocky, entirely bare, but backed by thick woods, with a number of large white houses appearing here and there. It is the eastern point of entrance to Branford Harbor,—a large cove of irregular shape, about a mile long and having an average width of three-eighths of a mile, in which anchorage is found in from six to twelve feet at low water. It is, however, much obstructed by ledges and sunken rocks and is not **Branford Harbor.** suitable for strangers, however light their draught. The village of **Branford** is situated about a mile back from the head of the harbor, on the banks of a narrow and crooked stream known as **Branford Creek.** The most of the land back of the village is thickly wooded and the shores of the harbor are faced with a yellowish rock.

Jeffrey's Point is also sometimes called **Indian Point**,—being the southwestern extremity of **Indian Neck**, which forms the eastern shore of the harbor.

Branford Point, the western point of entrance to Branford Harbor, is three-quarters of a mile to the westward of Jeffrey's Point, and is bare and composed of yellowish-white rock, backed by thick woods alternating with cultivated fields. It should not be approached from the southward nearer than seven hundred yards, as *long and dangerous shoals* make off in a southerly direction from the mainland a little to the westward of it.

Two rocky islets lie in the middle of the entrance to Branford Harbor. The easternmost and largest, known as Taunton Rock, is between five and six hundred yards **W.** by **S. $\frac{1}{2}$ S.** from Jeffrey's Point and is a little over one hundred yards long in a **N.** and **S.** direction. It has good water on all sides of it; but the main channel is between it and Jeffrey's Point. Four hundred yards to the westward of Taunton Rock is Blyn Rock, about thirty yards in diameter. It is about a quarter of a mile to the eastward of Branford Point, with a twelve feet channel on both sides of it. Both rocks are comparatively bold-to. **Taunton and Blyn Rocks.**

On the western side of Branford Point makes in a large but shallow cove about half a mile in diameter, in which anchorage may be found in from five to six feet at low water. Its eastern shores are, however, very foul, owing to the number of rocky islets, bare reefs, and sunken rocks extending off from it in a **SSW.** direction; while its western shores are comparatively bold to. The land on both sides is low and rocky,—woods and cultivated fields alternating.

The western point of entrance to this cove is called **Johnson's Point** and forms the eastern side of the mouth of a narrow and crooked stream, called **Farm River**, leading up to the village of **East Haven**, a mile and three-quarters inland. It is a long and narrow point of bare rock backed by marsh, and this again by thick woods, and **Johnson's Point.** strangers must not attempt to approach it. The mouth of Farm River is about three hundred yards wide.

About one hundred yards to the westward of Farm River makes in **Bradford's Cove**, small and unimportant. Three-eighths of a mile to the southward of it lies a mass of bare rock, two hundred yards long **E.** and **W.**, called **The Scotch Cap.** Vessels must not attempt to pass between this rock and the mainland, nor should they approach the rock from the southward nearer than a quarter of a mile.

About seven-eighths of a mile **W.** from the mouth of Bradford's Cove is South End, which is also two miles and three-quarters **W. $\frac{1}{2}$ N.** from Jeffrey's Point. It is low, flat and marshy, and backed by thick woods and cultivated fields dotted with houses. In the background will appear the high hills to the northward of East Haven. **South End.** South End is shoal and vessels should not approach the shore in its vicinity nearer than seven-eighths of a mile.

Five-eighths of a mile to the westward of South End is **Morgan's Point**, a low, flat, grassy point faced with rocks, and backed by trees alternating with cultivated fields. Dangerous sunken ledges lie off this point and it should not be approached nearer than five-eighths of a mile. Half a mile **NW. $\frac{1}{2}$ N.** from it is **Five Mile Point**, the eastern point of entrance to New Haven Harbor. This is easily distinguished by the white tower (which formerly carried **Five Mile Point.** the light) standing on its western extremity, in a clump of low scrub, near which there are several small houses. Back of the tower the land is thickly wooded with tall trees, between which and the low scrub is a narrow strip of

cleared land, which, when seen from the southward and eastward, looks like a large "nick" in the woods. Five Mile Point is faced with bare rocks, destitute of all vegetation, and vessels entering the harbor should give it a berth of not less than three hundred and fifty yards to the eastward.

New Haven Harbor is situated at the confluence of the **Quinnipiac** and **Mill** rivers, and its entrance is about thirty-nine miles to the westward of **The Race** and between forty-eight and forty-nine miles from **Throg's Neck**. Though of considerable commercial importance it is not a deep harbor,—twelve feet at low water being the best that can be taken up to the city and that through a very narrow channel. The city of **New Haven** is built upon the western bank of **Mill River** but is connected with the eastern shore by bridges.

The most remarkable object seen in the foreground, on approaching this harbor from the eastward, is **Southwest Ledge Light-house**, which will appear as a one-story eight-sided house with mansard roof, (all painted red,) and surmounted by the lantern rising from the centre. It is supported on an iron tubular foundation painted red and apparently standing in the water, and shows a fixed white light, of the fourth order, from a height of fifty-seven feet above the sea, visible thirteen miles. Its geographical position is

Latitude 41° 14' 2" N.
Longitude 72° 54' 45" W.,

and it bears from **Falkner's Island Light-house** W. by N. $\frac{3}{4}$ N., about ten miles and three-quarters, and from **Horton's Point Light-house** NW. by W. $\frac{1}{2}$ W., nearly twenty-three miles distant. From this light-house

	Miles.
Old Field Point Light-house bears SW. $\frac{1}{2}$ S. Southerly	nearly 18
Middle Ground Light-house SW. $\frac{3}{4}$ W.	13 $\frac{1}{2}$
Eaton's Neck Light-house SW. by W. $\frac{1}{2}$ W.	a little over 27
Stratford Point Light-house W. by S. $\frac{1}{4}$ S.	nearly 10

A bell is struck by machinery at intervals of fifteen seconds during thick weather.

The large iron spindle surmounted by a cask, seen about half a mile to the eastward of the light-house, is on **Quixe's Ledge**.

The western point of entrance to **New Haven Harbor** is called **Oyster River** or **Clark's Point**. It is low and grassy at its southern extremity, but the land rises to the northward with a gentle slope to a wooded crest about forty feet high. Behind this the hills begin, stretching in a line to the northward, with a pretty nearly equal elevation, and no specially remarkable feature, except **West Rock**, which will appear as a precipitous yellow bluff, with weather-furrowed face, projecting from the otherwise unbroken line of high lands. All along the western shore of the harbor, at the base of these hills, will be seen the level cultivated fields, thickly dotted with houses forming the village of **West Haven**, and still farther to the northward the city itself, with its many houses and spires, and the high hills in the background. On the eastern shore houses are thickly scattered from **Five Mile Point** to **South End**, and the line of distant hills is plainly seen above the low woods. Of these hills the most remarkable are **East Rock** and **Mount Carmel**, the former a precipitous bluff with yellow perpendicular faces, and level summit crowned with low trees and bushes; and the last mentioned composed of two humps, with a very peculiar "nick" between them, which renders it, perhaps, the most remarkable of all the hills in this vicinity.

From **Oyster River Point** to **Pond Point** the distance is a little over two miles and a half and the direction nearly SW. by W. Between the two the shore forms a couple of shallow coves, full of shoals and of no importance. The land is nearly level, cleared, cultivated, dotted with houses and backed by wooded hills. **Pond Point** is about sixty feet high, with a very gentle grassy slope and backed by trees. About half a mile to the northeastward of it is a steep hill over a hundred feet high, with cleared surface, perpendicular faces to the southward, and a single house on its summit. The water is shoal off **Pond Point**, which should not be approached nearer than three-eighths of a mile.

From **Pond Point** to **Stratford Point** the direction is SW. by W. $\frac{1}{2}$ W. and the distance a little over five miles; but the curves of the shore-line are numerous and very irregular,—a large bay being formed between the two points, into which empty the **Indian** and **Housatonic** rivers and several smaller streams. The shores of this bay are low and nearly level except between **Pond Point** and the mouth of **Indian River**, where they are somewhat hilly and undulating, diversified with cleared lands, marsh and groves of trees.

Welch's or Cedar Point is about seven-eighths of a mile to the westward of **Pond Point**,—a shallow cove of no importance lying between them. The point is low and flat,—the land rising very gradually to the northward to a wooded summit about a hundred feet high, which is on the southern bank of **Indian River**. This river, which empties into the Sound about half a mile to the northward of **Welch's Point**, is of no importance,—being bare at low water and having its mouth closed to navigation by a dam. Just to the westward of it is the entrance to **Milford River**,—a very narrow and shallow stream, at the mouth of which is what is called **Milford Harbor**, fit only for very small vessels. The village of **Milford**, which is situated on the western bank of this stream about three-quarters of a mile above its mouth, is seen over the low land.

Nearly a mile SW. by W. from **Welch's Point** lies **Charles' Island**,—a low island about a quarter of a mile in diameter, nearly round, gently sloping, and dotted with thick bushy trees except at its southern end, which has but a single **Lombardy poplar**. A large white house is visible above the trees on the summit of the island, and another, with tall brick chimney attached, is seen on the northwestern end. This latter is used as a fish-oil

factory. Charles' Island should not be approached from the southward nearer than three-eighths of a mile, and there is no passage to the northward of it,—a narrow sand spit, dry at low water, connecting it with the mainland. What is known as **Milford Roads** lies between this island and Welch's Point, with fair anchorage in northerly winds for small vessels.

From the mouth of Milford River the general trend of the shore is SW. by W. for three and a half miles to the mouth of the Housatonic River. The land is low and nearly level, diversified with woods and cleared fields, and in the background dotted with houses.

The Housatonic River, though of considerable length, is of but little commercial importance owing to the bar at its mouth, over which but two feet at low water can be taken through a very narrow channel. Vessels of very light draught may proceed up the river for about twelve miles; but beyond this there is no navigation. The **Housatonic River**. town of **Stratford** is situated upon its western bank, about two miles above Stratford Point, and is the only place of any importance on the river. The New York and New Haven Railroad crosses by a bridge about a mile above the town.

The eastern point of entrance to this river is formed by a long, low, flat sand beach extending in a southwesterly direction from the mainland for nearly three-quarters of a mile,—leaving a passage about five hundred yards wide between its western extremity and the western shore as the actual width of the entrance. This point, as well as the western shore, is skirted by extensive mud flats which are dry at low water.

Stratford Point, the western point of entrance, is of moderate height and grassy, with somewhat undulating surface and steep sandy faces to the southward and eastward. It is for the most part cleared and grassy, but there are a few clumps of trees here and there. The land back of it is all cleared and for the most part low and level. **Stratford Point and Light-house.** though the usual high hills are seen in the distance. On a cleared and nearly level space on its summit will be seen a light-house, painted white and black in vertical stripes, with a white house on each side of it. This is Stratford Point Light-house and shows a revolving white light, of the third order, from a height of fifty-three feet above the sea, visible twelve miles. This light revolves once in every minute and a half. Its geographical position is

Latitude ----- 41° 9' 5" N.
Longitude ----- 73° 6' 13" W.,

and it bears from

Southwest Ledge Light-house, W. by S. $\frac{1}{4}$ S.	Miles. about 10
Falkner's Island Light-house, W. Southerly	20 $\frac{1}{2}$
Horton's Point Light-house, W. by N. $\frac{1}{4}$ N.	30

From this light-house

Middle Ground Light-house bears S. $\frac{1}{4}$ W.	Miles. 5 $\frac{3}{4}$
Old Field Point Light-house S. by W. Westerly	10 $\frac{3}{4}$
Eaton's Neck Light-house SW. by W. $\frac{1}{4}$ W.	nearly 18
Norwalk Light-house W. by S. $\frac{3}{4}$ S.	15 $\frac{1}{2}$
Penfield's Reef Light-house W. by S. $\frac{1}{4}$ S.	5 $\frac{1}{2}$

A bell is struck by machinery during thick weather,—first, four blows at intervals of ten seconds, and after an interval of thirty seconds again four blows, ten seconds apart.

In this connection it may be mentioned that a prominent landmark for distinguishing the entrance to the Housatonic is Tashua Hill, which will appear in the distance as a very high, smooth, round hill, with a very prominent tree on its summit. It cannot be mistaken, as, apart from the peculiarities just described, it is by far the **Tashua Hill.** highest land in the vicinity.

From Stratford Point to Shoal Point the direction is W. $\frac{3}{4}$ S. and the distance nearly six miles and a half; but between these two points the shore forms a large bay, into which empty the Pequannock River and Fairfield Creek. The city of Bridgeport and the villages of Black Rock and Fairfield are situated on the shores of this bay and are plainly visible from the Sound. The land near the shore is all low, nearly level, and for the most part cultivated and thickly settled. The cleared lands are backed by trees, above which are visible the spires and larger houses of the towns. In the distance are high lands, (partly wooded, but for the most part bare of trees,) prominent among which is the round summit of Tashua.

From Stratford Point the trend of the shore is first W. $\frac{3}{4}$ S. for a mile and a half, (showing steep sandy faces, with cleared level summit,) and then about NW. for a mile and three-quarters to the eastern point of entrance to the **Long Beach Point.** Pequannock River and harbor of Bridgeport. This point is called Long Beach Point, and is easily recognized as a low flat sand beach, with a few houses near its northern end, and a long stone breakwater extending from it to the westward.

The western point of entrance is called **Park Point**, and is composed of low and nearly level land thickly dotted with clumps of trees,—the whole forming what is locally known as **Seaside Park**, belonging to the city of **Bridgeport Harbor.** The city itself occupies the western bank of the river, from **Wells' Point (The Tongue)**, half a mile above **Park Point**, to **Berkshire Pond**,—a distance of a mile and a half. The harbor is barred and at present has not more than twelve feet over the bar at low water through a channel one hundred feet wide, but the United States Engineers are engaged in widening this channel with the expectation of obtaining a width of two hundred feet.

At the entrance, about seven hundred yards to the southeastward of Park Point and nearly three-quarters of a mile to the westward of Long Beach Point, is **Bridgeport Harbor Light-house**, built upon the southeastern extremity of the long shoal making off from Park Point and thus marking the western limits of the channel. It is a screw-pile structure, supported on a stone foundation,—the tower rising from one end of the dwelling and both being painted white. It shows a fixed red light, of the fourth order, from a height of fifty-six feet above the sea, visible twelve miles and three-quarters. Its geographical position is

Latitude ----- 41° 9' 24" N.
Longitude ----- 73° 10' 48" W.,

and it bears from Middle Ground Light-house **NNW.**, six miles and five-eighths, and from Old Field Point Light-house **N. $\frac{1}{2}$ W.**, eleven miles distant. From this light-house Penfield's Reef Light-house bears nearly **SW. $\frac{1}{2}$ W.**, three miles, and Black Rock Light-house **W. by S. $\frac{1}{2}$ S.**, nearly two miles distant.

A bell is struck by machinery every fifteen seconds during thick weather.

From Park Point the shore runs about **W. $\frac{1}{2}$ S.** for a little over a mile to **Short Beach Point**,—being all low and flat and for the most part cultivated and dotted with houses. To the northward the land rises in natural terraces, generally well wooded, but with houses and steeples appearing at intervals and tall lone trees rising above the general crest of the woods. About a mile and three-quarters to the westward of Bridgeport Light-house will appear a white tower on the southern end of a low island and about three-quarters of a mile to the southward of the main shore. This tower is Black Rock Light-house and the island Fairweather Island, forming the eastern side of the harbor of Black Rock.

Fairweather Island is three-quarters of a mile long in a **N. by E.** and **S. by W.** direction, very irregular in shape, and for the most part covered at high water. Its northern end, which lies abreast of the village, is about six hundred yards to the southwestward of Short Beach Point, with which it is connected at low water, and from this northern end the island is covered at high water to within half a mile of the light-house. There are in fact two islands, joined by a rocky reef, and it is on the most southerly of the two, which is never covered, that the light-house is built. This southern island is composed of marsh and grass, destitute of trees, and has one or two houses on it. The light-house is built near the southwestern end, and is a white stone tower thirty-three feet high, which shows a fixed white light, of the fifth order, from a height of forty-three feet above the sea, visible twelve miles. Its geographical position is

Latitude ----- 41° 8' 30" N.
Longitude ----- 73° 13' 4" W.,

and it bears from Bridgeport Light-house **W. by S. $\frac{1}{2}$ S.**, nearly two miles, and from Middle Ground Light-house **NW. $\frac{1}{2}$ N.**, a little over seven miles distant. From this light-house Penfield's Reef Light-house bears **S. by W. $\frac{1}{2}$ W.** nearly, about a mile and a half, and Eaton's Neck Light-house **SW. Southerly**, thirteen miles and three-quarters distant. There is no fog-signal.

Fairweather Island when seen from the eastward will appear in range with the high land on the western side of Black Rock Harbor, called **Grover's Hill**, which appears over it as high, smooth, gently sloping land, between sixty and seventy feet high, dotted with cultivated fields interspersed with orchards, small clumps of trees and handsome houses. Its summit, however, is covered only with grass. The village of **Black Rock** extends along the base of this hill, on its eastern side, and occupies the western shore of the harbor to what is called **The Cove**, three-quarters of a mile above. Anchorage in from ten to twelve feet at low water is found and the channel is unobstructed; but the southern end of Fairweather Island should not be approached nearer than half a mile on account of the dangerous reefs making off from it.

On the western side of Grover's Hill makes in Fairfield Creek,—a very narrow and shallow stream, with marshy shores near its mouth, and of little importance,—being closed to navigation at low water. From the mouth of this **Fairfield Creek**. Creek to Shoal Point the trend of the shore is **SW. by S. $\frac{1}{2}$ S.** and the distance one mile. It is all low,—being composed of a flat sand beach backed by marsh, behind which is seen a cultivated and thickly settled country. The spires and houses in the village of **Fairfield** are especially prominent.

Shoal Point is a mere flat sand point, backed by marsh. From it extends in a **SE. by E.** direction for a little over a mile a very narrow sand spit, dry at low water, and called **Fairfield Bar**. From the eastern extremity of this bar a line of boulders and bare and sunken rocks extends in a **NE. $\frac{1}{2}$ N.** direction for a quarter of a mile and is known as **The Cows**; while on its southern side lies a long reef, with from one to five feet at low water, called **Penfield's Reef**.

On the eastern extremity of Penfield's Reef is built a light-house, called **Penfield's Reef Light-house**, which will appear as a one-story grey house with mansard roof, surmounted by a low tower and lantern painted white. The building is supported by a pier of dark granite, and the light shown is red, flashing at intervals of five seconds. It is of the fourth order, shown from a height of fifty-four feet above the sea, and visible thirteen miles. Its geographical position is

Latitude ----- 41° 7' 3" N.
Longitude ----- 73° 13' 11" W.,

Penfield's Reef Light-house bears from

	Miles.
Black Rock Light-house, S. by W. $\frac{1}{2}$ W. Nearly	about $1\frac{1}{2}$
Bridgeport Harbor Light-house, SW. $\frac{1}{2}$ W. Nearly	3
Stratford Point Light-house, W. by S. $\frac{1}{2}$ S.	nearly $5\frac{1}{2}$
Middle Ground Light-house, NW. $\frac{1}{2}$ W.	6 $\frac{1}{2}$
Old Field Point Light-house, N NW. Northerly	9 $\frac{1}{2}$

From this light-house Norwalk Light-house bears **W.** by **S. $\frac{1}{2}$ S.**, nearly ten miles, and Eaton's Neck Light-house **SW. $\frac{1}{2}$ W.**, about twelve and a half miles distant. In approaching it from the westward vessels should pass about three-eighths of a mile to the southward of it to avoid the shoal.

A bell is struck by machinery, two quick blows at intervals of twenty seconds, during thick weather.

At Shoal Point begins **Fairfield Beach**, which extends in a nearly **WSW.** direction for about a mile to Pine Creek Point, so called from the creek of that name which makes in on its northwestern side. The shore is a mere sand beach backed by marsh, and this again by cultivated and settled country. A mass of boulders lies about three hundred and fifty yards to the southwestward of Pine Creek Point; and a little to the westward of these a very narrow sand spit, bare at low water, extends about **N.** and **S.** for six hundred and fifty yards,—its southern end being about eight hundred yards from the point. It is the rule, therefore, for vessels passing this point to give it a berth to the northward of not less than three-quarters of a mile.

Pine Creek Point.

From Pine Creek Point to Kensie's Point the trend of the shore is **WNW.** and the distance five-eighths of a mile; and thence to the mouth of Mill River it is **NW. $\frac{1}{2}$ W.** and the distance three-quarters of a mile. The shore is all low except at Kensie's Point, which shows an almost perpendicular face to the southward, about ten feet high, from the summit of which grassy land for the most part under cultivation rises with a very gentle slope to a height of about seventy feet above the sea.

Kensie's Point.

Mill River is a very narrow stream of little importance, on the western bank of which is built the village of **Southport**, close to the mouth of the river. Strangers cannot enter this river, even at high water, but must always take a pilot. A stone breakwater, somewhat over one thousand feet in length, extends in a southwesterly direction from the eastern point of entrance; and on its extremity is built a granite beacon surmounted by an iron shaft and ball. About a quarter of a mile to the southward of this is another and similar beacon, which marks the eastern limits of the entrance and is called **Southport Beacon**.

Mill River.

From the mouth of Mill River to Farms Point the shore-line is very irregular,—being much cut up by coves and other indentations;—but its general course is **SW.** by **W. $\frac{1}{2}$ W.** for about a mile and three-eighths. **Sasco Creek** empties into the Sound about five-eighths of a mile to the westward of Mill River, but is extremely shoal and of no importance. **Jennings' Point**, about a quarter of a mile to the southward of the mouth of this creek, is a cleared and cultivated point with nearly level surface, faced by a sand beach strewn with innumerable boulders. From this to Farms Point the distance is about five-eighths of a mile.

Jennings' Point.

Farms Point, or **Frost's Point** as it is locally called, is, like Jennings' Point, low, nearly level, cultivated and settled. The beach in front of it is covered with boulders to a distance of a quarter of a mile from shore, and vessels should not attempt to approach it nearer than three-eighths of a mile.

From Farms Point to Sherwood's Point the direction is **W. $\frac{1}{2}$ S.** and the distance one mile. The shore is a strip of low, flat, grassy land, faced by a sand beach backed by marsh, and this again by a hilly undulating country, cleared, cultivated and settled. The sand beach between the two points is called **Alvord's Beach**, and is divided by the mouth of a narrow and crooked stream called **Muddy Brook**, which empties into the Sound about half a mile to the westward of Farms Point. **Alvord's Beach** is entirely clear of boulders.

Sherwood's Point was formerly called **Hansford Point**. It is flat, level, bare of trees and grassy, and the beach at its base, as well as that to the westward of it, is strewn with boulders. **Cedar Point** lies a mile and an eighth **W.** by **S. $\frac{1}{2}$ S.** from it, and between the two is formed a cove of irregular shape, into which empties a very narrow stream called **Sherwood's Creek**, which has its rise in a shallow pond about a hundred and fifty yards back, called **Sherwood's Pond**. The beach is strewn with boulders, especially abreast of the several projections of land, and notably so at **Hill's Point**, the western point of entrance to the creek. This point, which is low and cleared, lies at the base of a steep grassy hill called **Compo Hill**, and both its eastern face and the beach at its base are lined with large boulders, most of them bare at low water.

Sherwood's Point.

Cedar Point is a long narrow projection of sand, faced by a great mass of rocks, and forms the eastern point of entrance to Saugatuck River. It is backed by marsh, and this again by level cultivated lands thickly dotted with houses.

The western point of entrance to Saugatuck River is called **Seymour's Point**, from a rock of the same name which lies on the flats about a quarter of a mile to the eastward of it. It is composed entirely of marsh, and between it and Cedar Point the mouth of the river is five-eighths of a mile wide. The town of **Westport** is situated on both banks of the Saugatuck, about three miles above its mouth, but is of little commercial importance, as the river is closed to large vessels by a two-foot bar about three-quarters of a mile above the entrance. Vessels intending to enter the river must take a pilot.

Saugatuck River.

Off the mouth of Saugatuck River begins that line of islands extending in a southwesterly direction for nearly four miles and called the Norwalk Islands. Beginning with the eastermost they are known, respectively, as **Norwalk Islands.** Cockenoe's, (pronounced Cawkins,) Goose, Calf Pasture, Betts', Hay, Chimon's, Copps', Long Beach, Ram, Tavern, and Sheffield islands; and between them and the mainland is formed what is known as Sheffield Island Harbor.

From Seymour's Point to Calf Pasture Point the direction is **SW.** by **W.** $\frac{1}{4}$ **W.** and the distance a mile and three-eighths. The land is low and almost entirely composed of marsh, backed by cleared, cultivated and thickly-settled country. About midway between the two points and three hundred and fifty yards from the shore (with which it is connected at low water) lies a small island, about three hundred yards long **ENE.** and **WSW.**, called **Sprite Island.** It is nearly level, entirely bare of trees, and shows steep faces, fringed with boulders, to the southward.

Calf Pasture Point is the eastern point of entrance to Norwalk River, and is composed entirely of marsh land faced with mud and sand. It is very shoal in its approaches and vessels must not attempt to pass between it and the Norwalk Islands.

Norwalk River is five-eighths of a mile wide at its mouth, but gradually diminishes until, at the village of **Norwalk,** a little over two miles and a half above, it is a mere creek. Under appropriations by the United States Government a channel sixty feet wide, with six feet at low water, has been dredged from the mouth up to Norwalk, and it is proposed to increase it to a width of one hundred feet.

The western point of entrance to Norwalk River is a marshy point, known as **Beacon Point,** from the granite beacon on its eastern end. About three hundred yards to the westward of it is an island of firm grassy land, with somewhat steep faces and nearly level surface, rising from the marsh. To the northward the land rises to steep wooded hills with very irregular outlines. All this part of the shore is very shoal in its approaches and strangers must not attempt to pass into the river without a pilot.

From Beacon Point to Norroaton Point the direction is **SW.** by **W.** and the distance one mile and a half; but the shore-line is much cut up by coves and other indentations. At **Wilson's Point,** a mile to the westward of Beacon Point, the land is about sixty feet high, gently sloping, with steep rocky faces to the southward, and fringed with shingle strewn with many boulders. The rest of the shore is marshy and faced by mud flats. The small streams which make in on both sides of Wilson's Point are very shallow,—being for the most part bare at low water.

Norroaton Point is low, rocky, and covered with a thick growth of scrub. The land back of it is composed of a great number of high, steep, wooded hills, which present a very irregular outline. It is the northern point of the entrance to **Sheffield Island Harbor** from the westward,—Sheffield Island forming the southern point.

The Norwalk Islands, as before mentioned, lie in a line about three miles and three-quarters long along the northern shore of Long Island Sound. In coming from the eastward you first meet with Cockenoe's Island, which is crescent-shaped, with the rim to the southward, and a diameter of half a mile. Only the eastern half of the crescent is composed of good land,—the rest of the island being a mere narrow strip of sand and marsh. The eastern half of the island has a perfectly level surface, entirely under cultivation, with a single house upon it, and shows yellow sand bluffs with steep faces, separating the lower cultivated lands, and descending to a narrow sand beach fringed with boulders. From the northern side of this eastern end a very narrow strip of sand beach extends in a **NNW.** direction for six hundred and fifty yards to within one hundred and fifty yards of the sand spit **S.** of Seymour's Point, on the western side of the entrance to Saugatuck River. This narrow sand spit, extending as it does in a line parallel to the western half of the island, incloses a narrow and shallow cove, which affords an excellent boat harbor; but is otherwise of no importance. There is no passage between Cockenoe's Island and Seymour's Point.

Next to the westward of Cockenoe's Island, and three-quarters of a mile from it in a **SW.** by **W.** direction, is **Goose Island,** which is a mere narrow, low, sand spit, about three hundred yards long **N.** by **E.** and **S.** by **W.**, covered with grass and with a single house in the middle of it. At low water its boundaries are extended by the bare sands to a length of eight hundred yards; and at extreme low springs it is connected with Chimon's Island to the westward. It is surrounded by shoal water and vessels passing through the Sound must not approach it nearer than half a mile.

Between Goose Island and Cockenoe's Island is a good anchorage, with thirteen feet at low water, called **Cockenoe's Island Harbor.**

Next to the westward of Goose Island is **Copps' Island,** a low sandy islet, lying **W.** by **N.** and **E.** by **S.**, and about four hundred yards long. It is destitute of trees, but has a single house near its eastern end. Its eastern extremity is distant from Goose Island seven-eighths of a mile in a **SW.** $\frac{1}{4}$ **W.** direction; but the space between is occupied by flats and dangerous sunken ledges, so that no safe passage exists.

A quarter of a mile to the northward of Copps' Island and three-quarters of a mile to the westward of Goose Island is **Chimon's Island,** a low sandy islet, nearly level, but showing steep yellow faces to the southward and eastward. There is a single house near the middle of the island. A sand beach, strewn with innumerable boulders, surrounds it and extends to the southward to within fifty yards of Copps' Island. Shoal water makes off from it, except on its western side, where there is a pocket with from three to five fathoms between it and **Ram Island.**

Two hundred yards to the eastward of Chimon's Island is **Hay Island**, which lies **E NE.** and **W SW.** and is four hundred yards long. It is low, bare of trees, nearly level on top, with steep faces descending to a sand beach fringed with boulders, and there is no passage on any side of it.

Three hundred and fifty yards to the northward of it is **Betts' Island**, which extends to the westward to within one hundred and fifty yards of the northern side of Chimon's Island. It is, in reality, two islands, three hundred yards apart, and joined at half tide by a strip of shingle. The easternmost and larger of the two is about one hundred and fifty yards long (**E.** and **W.**) and is composed of sand covered with grass, with steep faces descending to a beach fringed with boulders. The western island is only about one hundred yards in diameter and composed of bare sand.

Five-eighths of a mile to the northward of Hay Island and a little over three-quarters of a mile to the westward of Cockenoe's Island lie the **Calf Pasture Islands**, three small rocky islets,—the largest of triangular shape and about one hundred yards in diameter, and the other two mere bare rocks surrounded by shoals. The largest island is low, nearly level on top, and has a steep rocky face to the southward, the beach at the base of which is thickly covered with boulders to a distance of one hundred and fifty yards. Bare rocks and ledges bare at low water lie to the eastward of this island and dot the space between it and Hay and Betts' islands, and extensive flats connect it with the mainland. **Round Beach Island**, a mass of stones and rocks, lies a little over half a mile to the westward of it and about two hundred yards from Calf Pasture Point, on the eastern side of the entrance to **Norwalk River**, while on the western side of the same entrance and about seven hundred and fifty yards to the westward of Round Beach is **Long Beach Island**, composed of marsh, about two hundred and fifty yards in diameter, the western end of which is about two hundred yards to the eastward of **Beacon Point**. At low water this island is increased in length to nearly seven hundred yards by a bare spit composed of sand and pebbles fringed with boulders. The channel into **Norwalk River** passes between this and Round Beach Island with six feet at low water. The space to the southward of it, or between **Beacon Point** and **Ram Island**, is studded with islets, bare rocks and ledges bare at low water, through and among which winds the channel leading to the river. Of these islets the northernmost is called **White Rock** and is about a quarter of a mile to the southward of **Beacon Point**. **Tree Hammock** and **Sandy Hammock** lie about three hundred and fifty yards to the southward of **White Rock**,—the channel passing between it and them;—while **Ram Island Hammock** is only about two hundred and fifty yards from the northern shore of **Ram Island**.

Ram Island is the next of the larger islands to the westward of Chimon's Island, from which it is distant about six hundred yards. It lies nearly **E.** and **W.**, is about eight hundred yards long, and when seen from the southeastward appears low, flat and grassy, dotted at nearly regular intervals with tall lone trees. A clump of thick low scrub—above which project the tops of a few taller trees—stands near its western end; while another clump of bushy trees is seen near the eastern end.

At low water **Ram Island** is connected by a mud flat, mixed with stones, with **Sheffield Island**, the westernmost as well as the largest of the group. This island is very irregular in shape, lies nearly **E.** by **N.** and **W.** by **S.** and is about a mile long. It is low, level and for the most part sandy, with a thick growth of bushy trees about midway of its length, in the middle of which will appear a large white house with flag-staff in front of it. Its eastern end is almost entirely marshy, while the middle of the island is occupied by cultivated fields, and its western end terminates in a long, narrow, curved sand spit, locally known as **The West Hook**. The beach surrounding the island is strewn with boulders, especially on the southern side where the land descends precipitously.

About a quarter of a mile from the end of **The West Hook** and close to the grove of trees above mentioned will be seen a two-story stone house of a grey color, surmounted by a low tower and lantern; and a little to the northeastward of this a smaller house, painted white. The tower is called **Norwalk Light-house**, and shows a fixed white light, varied at intervals of one minute by red flashes, visible twelve miles and a half. The house stands upon a low point six feet above high water and the light is shown from a height of fifty-two feet above sea-level. Its geographical position is

Latitude 41° 2' 53" N.
Longitude 73° 25' 11" W.,

and it bears from

	Miles.
Penfield's Reef Light-house, W. by S. $\frac{1}{2}$ S.	nearly 10
Stratford Point Light-house, W. by S. $\frac{1}{4}$ S.	about 15 $\frac{1}{2}$
Middle Ground Light-house, W. $\frac{1}{2}$ N.	14 $\frac{1}{2}$
Falkner's Island Light-house, W. $\frac{1}{2}$ S.	36
Old Field Point Light-house, NW. by W. $\frac{1}{4}$ W.	14 $\frac{1}{2}$
Eaton's Neck Light-house, N. $\frac{1}{2}$ W.	5 $\frac{1}{2}$

From this light-house **Great Captain's Island Light-house** bears **W.** by **S. $\frac{1}{2}$ S.**, a little over ten miles, and **Execution Rocks Light-house** **SW.** by **W. $\frac{1}{4}$ W.**, a little over eighteen miles distant. There is no fog-signal.

Half a mile to the northward of Sheffield Island and about six hundred yards to the southeastward of Wilson's Point is Tavern Island, a small islet about two hundred yards long, with a rocky hillock at its western end on which is a tall flag-staff. Its surface is dotted with low trees, and there is a large single tree at its eastern end and a house near the centre of the island. There is no passage between it and Wilson's Point.

On the Southern Shore of Long Island Sound, from Old Field Point to Crane Neck Point, the direction is *W. ½ S.* and the distance (in a straight line between the two points) nearly two miles; but the shore curves to the southward,—forming a sort of bight in which anchorage may be found in from two to three fathoms during southerly winds. It is not recommended, however, as the bottom is hard and does not afford good holding-ground. The land is low, very gently sloping, and for the most part wooded except at the entrance to Flax Pond, about a mile and a quarter to the westward of Old Field Point, where there is a fringe of marsh and sand.

Crane Neck Point, the northwestern extremity of Crane Neck, is a high, bluff, sandy head, with steep precipitous faces, ranging in height from sixty to one hundred and twenty feet. It is mostly wooded, and its northwestern slopes are terraced and show a series of yellow sandy faces with dark-looking bushes clinging to them. The beach at its base is strewn with boulders, and the point itself is shoal in its approaches and should receive a berth of not less than half a mile.

Crane Neck Point is also the eastern extremity of Smithtown Bay, which is formed by that great curve in the northern shore of Long Island which extends from Crane Neck to The Broken Land, and into which flow the waters of Stony Brook, Nissequague River and Sunken Meadow Creek,—each of which has thriving settlements on its banks. Between Crane Neck Point and The Broken Land the bay is nearly seven miles wide, and, measuring perpendicularly to a line joining these points, it is over two miles long in a *N.* and *S.* direction. The general trend of its eastern shore from Crane Neck Point to Stony Brook Beach is nearly due *S.*; but the outline is irregular,—first curving to the southeastward for half a mile, then turning to the eastward for three-eighths of a mile, and then about *S.* by *W. ½ W.* for two miles to the eastern point of entrance to Stony Brook Harbor. From Crane Neck Point for a mile and three-eighths to the southward the shore is composed of steep wooded bluffs, with precipitous sandy faces descending to a narrow beach; and thence to the mouth of Stony Brook Harbor of a narrow sand beach backed by meadow land, and this again by wooded hills sparsely dotted with houses.

The entrance to Stony Brook is not quite two hundred yards wide and extremely shoal,—but three feet at low water being found in a very narrow channel. When fairly past the entrance the stream turns to the westward, widens to nearly nine hundred yards, and is separated into several small channels by large marsh islands. This westerly course continues for a little over a mile, when it spreads away to the northward and southward into a large but shallow bay about a mile and a half wide, known as Stony Brook Harbor. The village of Stony Brook is situated on the eastern bank of the stream just above its mouth; but the place is of little commercial importance (owing to the shallowness of the entrance) and is frequented by very small vessels only.

Stony Brook Beach, on the western side of the entrance, is a strip of low land about a mile and three-eighths long, from ten to twenty feet high, partly wooded and backed by marsh. The main channel of the harbor passes along its southern side between marshy banks. The land on which the village is built is high and partly wooded, with precipitous faces towards the harbor. The channel leading from the Sound passes between two immense sand flats, dry at low water;—those making off from Crane Neck being known as East Flats and extending nearly half a mile from shore, and those from Stony Brook Beach, called West Flats, extending to the northward about a third of a mile.

At the western extremity of Stony Brook Beach and a mile and three-eighths from the entrance to Stony Brook begin the Bassapeague Bluffs,—a long line of steep cliffs from forty to sixty feet high, with level summit, diversified with woods and cleared lands. The cliffs are faced by a narrow sand beach and extend about *W.* by *S.* for nearly two miles, where they terminate in a flat sand beach, called East Bar, which extends for half a mile to the westward to the entrance to Nissequague River and Smithtown Harbor. East Bar is also sometimes called Smithtown Beach.

Nissequague River is a narrow and shallow stream, having a nearly *SE.* course from its mouth towards its head, and is full of marsh islands, which separate it into numerous small channels. It is of little importance, as not more than eight feet at high water can be taken into it, and that only through a very narrow channel. The entrance between East Bar and West Bluff is only about sixty yards wide, and no stranger, however light his draught, should attempt to approach it. The village of Nissequague is built upon the eastern bank of the river about a mile above its mouth, and the small settlement of Darlington on the western bank about half a mile beyond the former.

West Bluff, the western point of entrance, is a sandy cliff with nearly level summit, cleared and cultivated, and with several houses upon it. It descends to a narrow beach from which a large pier extends, known as New Dock. From this bluff the shore has a general direction *NW.* by *W. ½ W.* for three miles and a half to The Broken Land, passing, first, the mouth of Sunken Meadow Creek half a mile beyond West Bluff; then Sunken Meadow Beach, extending from the mouth of the creek to the northwestward about a mile and a quarter; and then a range of cliffs of various heights, about a mile and three-eighths long.

Sunken Meadow Creek is a narrow and crooked stream, of no importance, which runs in a nearly W. direction for about a mile and a quarter. **Sunken Meadow Beach** is a narrow strip of sand backed by trees, and extending from the mouth of the creek to the eastern end of the cliffs. The cliffs between the beach and The Broken Land are nearly level on top and for the most part wooded. About midway of their length is the traditional site of one of the burial places of Kidd's treasure, locally known as **Kidd's Money Hole**. At their western end the land descends to a narrow, flat, marshy valley, separating them from The Broken Land.

Sunken Meadow Creek.

The Broken Land is a section of hilly country about three-quarters of a mile in length, and is formed by two hills over one hundred feet high, separated by a narrow valley but little elevated above sea-level. They are partly wooded and partly grassy, and on their northern side are cut into natural terraces with precipitous faces descending to a narrow sand beach. Many boulders and sunken rocks lie off this beach, extending to a distance of eight hundred yards. In fact, all of the shore of Smithtown Bay, from Stony Brook Entrance to the westward, is foul, and vessels standing to the southward should not approach it nearer than a mile.

The Broken Land.

On the western side of The Broken Land begins Crab Meadow Beach, which extends in a WNW. direction for three-quarters of a mile to the mouth of **Crab Meadow Creek**. It is a narrow strip of sand, about one hundred yards wide, dotted with sand hillocks ranging in height from ten to twenty feet and backed by marsh. The creek is very narrow and shallow and of no importance,—being almost entirely closed at low water, and having a width of only twenty yards at its mouth. A bare rock, called **The Sugar Loaf**, lies about four hundred and fifty yards NW. from the mouth of this creek and a little over three hundred yards from the nearest shore.

Crab Meadow Beach.

On the western side of Crab Meadow Creek the land is undulating, rises to a height of one hundred feet, with steep faces to the northward, and has a general course about W. $\frac{1}{2}$ S. Half a mile to the westward of the creek (where the cliff is somewhat higher) the high land terminates at **Vinegar Point**, which is separated from another small cliff, about three-eighths of a mile to the westward, by a cove mostly occupied by meadow grass and known as **Joel's Cove**. Here begins **East Beach**, which extends in a NW. by N. direction for about a mile and separates Northport Bay from the waters of the Sound. This beach is from an eighth to a quarter of a mile wide and has several sand hillocks upon it, with a few trees. At its northern end there will be seen, about half a mile back from the shore, a very remarkable-looking round hill about one hundred feet high, thinly wooded, and showing a perpendicular bluff at its southern end. This is **Duck Island Bluff**, in Northport Bay; and three-eighths of a mile to the north-eastward of it, and three hundred yards back from the beach, will be seen another hill of the same height, with wooded slopes and grassy summit, and low cliffs about twenty feet high on its northern and eastern sides. This is the northern end of **Duck Island**, as the bluff is the southern end,—the two being joined by a strip of sand and marsh. **Duck Island** is in reality, however, a neck of land connected with the beach by salt-meadow, and projecting in a southwesterly direction into Northport Bay. On its northwestern side, and between it and the southeastern shore of Eaton's Neck, is formed a convenient little harbor for small vessels, called **Duck Island Harbor**.

East Beach.

Duck Island Bluff.

Duck Island.

From the northern end of East Beach the trend of the shore continues NW. by N. for a mile and three-quarters to Eaton's Point. The high wooded hills of Walnut and Eaton's necks are seen over the low beach; and just to the southward of the point a grassy hill, about eighty feet high, rises steeply from the beach with precipitous face about twenty feet high, and bare ledges cropping out at intervals on its eastern slopes.

Eaton's Neck is composed of a series of hills with gentle slopes, separated by narrow valleys. Its surface is, therefore, undulating and is diversified with wooded and cultivated lands,—the summits of the hills being for the most part cleared. The Lombardy poplar is a prominent feature of the landscape in this vicinity. On the southern side of the neck is the convenient harbor of Northport Bay, and on its western side is Huntington Bay, embraced between this neck and Lloyd's Neck, and in which anchorage may be found in from three to eight fathoms, sheltered from all except northerly winds.

Eaton's Neck.

Eaton's Point, the northern extremity of the neck, is a bold bluff between eighty and ninety feet high, with precipitous face on the northern side rising to a height of about thirty feet. Its western slopes are wooded, but its summit and eastern side are cleared; and on the former is built the light-house with the keeper's dwelling close to it. This light-house is known as **Eaton's Neck Light-house** and is a stone tower, sixty-three feet high, painted white, and shows a fixed white light, of the third order, from a height of one hundred and forty-seven feet above the sea, visible eighteen miles. The keeper's dwelling, which is close to the tower, is also painted white, and is remarkable for the peculiar black appearance of its windows. To the northwestward of the light-house, on the edge of the bluff, a small white building with a tall pipe of the same color projecting from its roof is seen against the high woods behind it. This contains the **fog-signal**, which is a second order steam siren, (in duplicate,) giving blasts of nine seconds at intervals of thirty-five seconds.

Eaton's Neck Light-house.

The geographical position of Eaton's Neck Light-house is

Latitude ----- 40° 57' 12" N.
 Longitude ----- 73° 23' 45" W.

Eaton's Neck Light-house bears from

	Miles.
Penfield's Reef Light-house, SW. $\frac{1}{2}$ W.	about 12 $\frac{1}{2}$
Stratford Point Light-house, SW. by W. $\frac{1}{2}$ W.	17 $\frac{1}{2}$
Southwest Ledge Light-house, SW. by W. $\frac{1}{2}$ W.	a little over 27
Middle Ground Light-house, W. by S. $\frac{1}{2}$ S.	14 $\frac{1}{2}$
Old Field Point Light-house, W. $\frac{1}{2}$ N.	a little over 12 $\frac{1}{2}$

From this light-house

	Miles.
Norwalk Light-house bears N. $\frac{1}{2}$ W.	about 5 $\frac{1}{2}$
Great Captain's Island Light-house W. by N. $\frac{3}{4}$ N.	about 10 $\frac{1}{2}$
Lloyd's Point (the northwestern extremity of Lloyd's Neck) W. $\frac{1}{2}$ N.	a little over 4

Huntington Bay is a large deep bay lying nearly N. and S., two miles and a half long, and having an average width of a mile and a quarter. On the east it is bounded by Eaton's Neck and West Beach; on the west by Lloyd's Neck; and on the south by East Neck and Great Neck. That portion of its eastern shores which is formed by Eaton's Neck

Huntington Bay. is hilly and undulating; and there is one remarkable perpendicular sandy cliff about a hundred feet high, with two tall Lombardy poplars on its nearly level summit, about a mile and a half to the southward of Eaton's Point. The neck terminates to the southwestward in a long, flat, sandy point, dotted with hillocks and clumps of low scrub. This is **West Beach**, and forms the northern point of entrance to **Northport Bay**, sometimes called **Cow Harbor**.

Lloyd's Neck, which forms the western shore of the bay, is a large peninsula, lying nearly E. and W., three miles long and from half a mile to a mile and three-quarters in width. Its surface is hilly and undulating, for the most part wooded except on its southern side, where there is much cultivated land dotted with houses. This neck is joined to the mainland at its southwestern end by a narrow strip of sand beach a quarter of a mile long called **Lloyd's Beach**. It is also separated from **West Neck** on the southern side by a long and shallow cove called **Lloyd's Harbor**, in which anchorage is found in from four to twelve feet at low water.

The eastern extremity of Lloyd's Neck is called **East Fort**, from an old earth-work built upon the summit of a steep bluff about eighty feet high with perpendicular faces to the eastward. The summit of the bluff is cleared near the edge, but the rest is thickly wooded; and at its base is a remarkable tall boulder whose peculiar appearance renders the point unmistakable.

From **East Fort** the northern shore of the neck trends about NW. by W. $\frac{1}{2}$ W. for two miles and three-quarters to Lloyd's Point, its northwestern extremity. The land is high and rolling, and covered with thick woods until within a mile of the point, where the hills terminate in a long, perpendicular, sandy cliff over one hundred feet high, with its summit fringed with scrubby trees. This is **Northeast Bluff**, and at its base begin low level lands, covered with scrub and grass, and known as **The Meadows**.

The Meadows extend to the northward and terminate at Lloyd's Point, which is low, flat and sandy, and has a long grove of low trees a little way back from its northern end. From this point the shore turns abruptly to the southward, running about SW. by S. $\frac{1}{2}$ S. for a mile and a half, forming the western side of the neck and the eastern side of the entrance to Oyster Bay. This western shore is composed of low meadow lands, backed by steep wooded hills for a distance of a mile to the southward of Lloyd's Point, where a high, steep, precipitous bluff rises from the beach, with a grassy level summit except at the edge of the cliff, where there is a clump of scrubby trees. This is called **Northwest Bluff**. On its southern side the land descends gently for about a quarter of a mile, terminating in sandy cliffs from twenty to forty feet high, with a narrow strip of low grassy land separating it from West Fort to the southward. West Fort, like East Fort, is named from the earth-work on its summit, and is a nearly perpendicular bluff, with low scrub clinging to the face of the cliff. There is a large and handsome house, surrounded by cleared fields, on the summit; but the most of the bluff is covered with woods. About six hundred yards to the southward the high lands terminate abruptly in the flat sand of Lloyd's Beach, which extends to the southeastward for seven-eighths of a mile to the mouth of **Brick-yard Creek**, in Cold Spring Harbor.

Oyster Bay is contained between Lloyd's Neck and West Neck on the east and Centre Island and **Mill Neck** on the west. It is very irregular in shape, being divided into two parts by Centre Island, the eastern side of which forms also the western shores of its entrance. Its eastern point of entrance is formed by Northwest Bluff and its western by **Oyster Bay and Harbor.** Centre Island Point, the northern extremity of Centre Island. About a mile to the southward of the entrance the bay divides,—one arm continuing to the southward for two miles and a quarter to the village of **Cold Spring** and forming a wide cove, embraced between West and Cove necks, called **Cold Spring Harbor**; and the other arm turning to the westward between **Cove Neck** and Centre Island, then passing between the southern end of Centre Island and the main, and then turning to the northward between the island and **Mill Neck**, thus forming a large horse-shoe shaped bay known as Oyster Bay Harbor.

There is excellent anchorage and perfect shelter in both this and Cold Spring harbors; but the entrance to the bay is very much contracted by a long spit making off from the western shore of Centre Island for seven-eighths of a mile, leaving an available channel of only three hundred yards between its extremity and West Fort. This spit is known as **Centre Island Shoal**.

Centre Island, sometimes called **Hog Island**, is a peninsular of irregular shape, lying nearly **NNE.** and **SSW.** and about two miles long. It is hilly and undulating, but nowhere very high, and is for the most part thickly wooded. Its northern extremity is called **Centre Island Point**, and terminates in a precipitous bluff nearly one hundred feet high, with a group of tall straight trees on its summit, which are very remarkable, the rest of the growth being only low scrub and small bushes. The bluff descends gently to the westward and terminates in a narrow flat sand beach, called **Centre Island Beach**, by which it is joined to Oak Neck. The eastern shore of the island, to the southward of Centre Island Point, is lower and not so steep, except about five-eighths of a mile below the point, where there is a low sand cliff about twenty feet high. **Centre Island.**

A very dangerous line of rocks extends to the northward from Centre Island Point for three-quarters of a mile and is called **Centre Island Reef**. Vessels standing to the southward should not approach the point nearer than a mile and a quarter.

From Centre Island Point to Oak Neck Point the direction is **W. $\frac{1}{4}$ N.** and the distance a little over two miles; but the shore takes a bend to the southward,—forming a large bight, in which anchorage may be found in from two to four fathoms sheltered from easterly winds by Centre Island Reef. **Oak Neck Point** is the northern end of Oak Neck, and is gently sloping except at its extremity, where it terminates in a nearly perpendicular cliff. It is cleared, finely cultivated, and has several houses upon it. Oak Neck is of moderate height, gently sloping, and for the most part thickly wooded; but at its northern end and on its western side are cleared and cultivated lands descending with a gentle slope to a narrow marshy valley, leading to the shores of Mill Neck Creek. On the east it is joined to Centre Island Point by a strip of low land thickly covered with trees, over which are seen the high wooded hills on Mill Neck. On the south it is separated from Mill Neck by a shallow stream, called **Mill Neck Creek**, which empties into the northwestern end of Oyster Bay Harbor. **Oak Neck.**

To the westward of Oak Neck the land is low, nearly level, finely cultivated, and diversified with clumps of trees and grassy fields sloping gently back to the higher lands in the background, which are crowned with thick woods, but for the most part cultivated throughout the whole extent of their northern slopes. The line of flat beach to the westward of Oak Neck is broken, at a distance of five-eighths of a mile, by a small sand hill with level grassy surface and steep faces to the northward, rising abruptly, like an island, from the surrounding beach. This is **Fox Island.** Two houses are seen near its centre with a flag-staff close to them, and the beach at its base is strewn with boulders.

It is not safe to approach the shore between Oak Neck Point and Fox Island nearer than half a mile.

Three miles **W. $\frac{1}{4}$ S.** from Oak Neck Point is Matinicock Point; and about midway between the latter and Fox Island is a small wooded point with perpendicular faces called Peacock Point. The beach at its base is strewn with boulders, as is the case abreast of Fox Island; while in the coves on either side there are none. The shore between Fox Island and Matinicock Point is composed of a flat sand beach backed by high rolling country, diversified with woods and cleared fields and occasional clusters of houses. **Peacock Point.**

Matinicock Point is a long level point about twenty or thirty feet high, dotted with a thin and scattered growth of trees, and terminating in a precipitous sandy cliff fringed with a long reef of rocks. On its western side the shore turns abruptly to the southward, running about **SW. $\frac{1}{4}$ S.** for a mile and three-quarters to Red Spring Point, the eastern point of entrance to Hempstead Harbor. This part of the shore is similar to that to the eastward,—being composed of high rolling lands, fringed with low grassy fields and faced by sand beach. The slopes of the hills are in part cultivated and in part wooded. West Island, about five-eighths of a mile below Matinicock Point, is a nearly round hill about thirty feet high (with a level summit and precipitous sandy faces) which rises abruptly, like an island, from the surrounding flat marshy lands. Its surface is covered with a thin growth of large trees except at its southwestern end, where there is a thick grove of tall spruce, pine, and other trees. A group of houses occupies the middle of the island and occasional glimpses of them are seen through the trees. **West Island.**

Hempstead Harbor is a large and deep cove lying nearly **N.** and **S.** and four miles and a half long. At its mouth, between Red Spring Point and Prospect Point, it is nearly two miles and three-quarters wide, but gradually contracts in width until at the village of **Hempstead** or **Roslyn**, at its head, it has become a mere brook. The harbor proper ends about three miles above the mouth of the cove, where its width is diminished to two hundred yards by a long narrow strip of sand beach making out from the western shore and known as **Harbor Beach**. To the southward of this beach it spreads out again to a width of about seven hundred yards, which it keeps for a little over a mile, when it suddenly terminates in a narrow stream leading to the village of Roslyn. **Hempstead Harbor.**

Red Spring Point, the eastern point of entrance to this harbor, is a steep wooded bluff with perpendicular sandy faces and level grassy summit. On its extreme southwestern point there is a large clump of high bushy trees, and the beach at its base has a number of large boulders extending out below low-water line,—a feature which is repeated abreast of every projection on both shores of the harbor. The point is comparatively bold-to and may be safely approached within four hundred yards with not less than four fathoms water. **Red Spring Point.**

Prospect Point, the western point of entrance to Hempstead Harbor, shows as a high grassy bank with steep sandy faces, rising abruptly from the low sandy shore. There is a thin fringe of trees on top, but near the edge of the bluff the surface is a nearly level grassy field. The point is fringed with rocks and there are a number of outlying boulders, the most prominent of which is **The Old Hen**, three hundred yards from shore and awash at low water. **Prospect Point.**

To the eastward of Prospect Point the trend of the shore is about **SE.** by **E.** for nearly two miles to **Mott's Point**, where the western shore of the harbor turns abruptly to the southward, running about **S.** by **E.** $\frac{1}{2}$ **E.** to Harbor Beach.

Mott's Point. This point is very prominent when seen from the Sound, and will appear as a perpendicular sandy bluff at the eastern extremity of a long line of high precipitous cliffs of yellow sand, which extend in a **NW.** direction nearly to Prospect Point. These cliffs, together with **Mott's** and **Prospect** points, form the northeastern shore of **Cow or Manhasset Neck**, which separates Hempstead Harbor from Manhasset Bay. The summit of **Mott's Point** is fringed with scrub backed by thick woods, and has a large house on it. The cliffs extend to the northwestward from it for a mile and a quarter, or to within five-eighths of a mile of **Prospect Point**, where they terminate in low level lands, partly sandy and partly marshy and thinly dotted with trees, which extend to the mouth of a small creek washing the southern and eastern faces of **Prospect Point**.

Sands' Point is three-quarters of a mile to the westward of **Prospect Point** and is the northwestern extremity of **Manhasset Neck**. When seen from the eastward it appears as a level, cleared, rocky point, with a long reef bare at low water extending from it to the northwestward, and a white tower, with dwelling-house attached, near the extremity of the point. A large bushy tree will appear behind the tower with a group of houses close to it; but on passing the point the woods appear to come close down to the light-house, and above them will be seen the top of a large white house surmounted by a cupola. Several sickly-looking poplars and an old hut stand close to the extremity of the point.

The land between **Prospect Point** and **Sands' Point** is for the most part low and thickly wooded.

Sands' Point Light-house is a stone tower forty-six feet high, painted white, and attached to the keeper's dwelling, which is painted a light-brown. It shows a revolving white light, of the fourth order, from a height of sixty-eight feet above the sea. The light revolves once in thirty seconds and is visible thirteen miles. Its

Sands' Point Light-house. geographical position is

Latitude 40° 51' 55" N.
Longitude 73° 43' 48" W.,

and it bears from **Great Captain's Island Light-house** nearly **SW. $\frac{1}{2}$ S.**, eight miles and three-eighths, and from **Norwalk Light-house SW.** by **W. $\frac{3}{4}$ W.**, about eighteen miles and a quarter distant. From this light-house the light-house on **Execution Rocks** bears **N.** by **W. $\frac{3}{4}$ W.**, seven-eighths of a mile, and **Throg's Neck Light-house SW. $\frac{1}{2}$ W.**, four miles and a half distant. There is no fog-signal.

Nearly a mile to the northward of **Sands' Point Light-house** lie **Execution Rocks**, guarding the northern side of the **Main Channel**. These are a group of rocks partly bare and partly sunken, extending about **NNE.** and **SSW.** for three-quarters of a mile. On the largest, which is a bare rocky islet about ten feet high, is built the light-house,—a white stone tower attached to a two-story granite dwelling and showing a fixed white light, of the fourth order, from a height of fifty-eight feet above the sea, visible thirteen miles. Its geographical position is

Latitude 40° 52' 38" N.
Longitude 73° 44' 17" W.,

and it bears from **Great Captain's Island Light-house SW. $\frac{1}{2}$ W.**, a little over eight miles, and from **Norwalk Light-house SW.** by **W. $\frac{1}{2}$ W.**, seventeen miles and five-eighths distant. From this light-house **Throg's Neck Light-house** bears **SW. $\frac{3}{4}$ S.**, five miles distant. The **Main Channel** passes between this and **Sands' Point Light-house**.

A fog-trumpet of the first order gives blasts of seven seconds at intervals of forty-three seconds during thick weather, and a powerful fog-horn is sounded in case of accident to the trumpet.

There is a wide and good passage on the northwestern side of **Execution Rocks** with not less than eight fathoms in it, but it is not often used.

A little over a mile **SW.** by **S. $\frac{1}{2}$ S.** from **Sands' Point** is **Barker's Point**,—the eastern point of entrance to **Manhasset Bay**. Between the two points the shore forms a cove, in which anchorage may be found in from twelve to sixteen feet at low water, and which is often resorted to by coasters bound to **New York**. Its shores are low and faced by a sand beach, over which appear higher cleared lands crowned with woods. **Barker's Point** is a high sandy bluff with nearly perpendicular faces and level grassy summit, fringed with a thin growth of large trees. A dangerous reef of rocks makes off from it to the northwestward five-eighths of a mile and a black buoy is placed upon its extremity.

Manhasset Bay is a large cove of irregular shape and nearly four miles long, which makes into the southern shore of the **Sound** in a nearly **SE.** direction. At its mouth it is seven-eighths of a mile wide between **Barker's** and **Hewlett's** points, and does not begin to diminish until you are past **Mott's Point**, a mile and three-quarters above. It has good anchorage in from ten feet to five fathoms, sheltered from all winds; but only fourteen feet at low water can be taken over the bar at its mouth.

Hewlett's Point is of moderate height, grassy, with steep faces and backed by thick woods. It is also faced by a line of reefs, which extends to the northward for about three hundred yards, and is in places bare at low water. The point is the northern extremity of **Great Neck**, which separates **Manhasset Bay** from **Little Neck Bay**, and here the shore

turns abruptly to the southward, running about **SW.** by **S. $\frac{1}{2}$ S.** to **Elm Point**, a mile and a half from **Hewlett's**. The shore-line is irregular,—being indented by a large but shallow cove of no importance called **Hewlett's**

Cove. This part of the shore is from forty to eighty feet high, undulating and almost entirely under cultivation, being composed of orchards and cultivated fields, dotted with clumps of trees and backed by woods.

Elm Point is the western extremity of Great Neck and the eastern point of entrance to Little Neck Bay. It is steep, bluff and sandy, thinly covered with woods, and has a large white house near the water and a long wharf extending from it, upon which is a warehouse. A long and dangerous reef extends from it to the northwestward for three-quarters of a mile and is known as **The Stepping Stones**. Upon their northwestern extremity is built the light-house known as Stepping Stones Light-house,—a one-story stone dwelling, supported on a granite pier and surmounted by a lantern, which shows a fixed red light, of the fifth order, from a height of forty-nine feet above the sea, visible ten miles. Its geographical position is

Stepping Stones Light-house.

Latitude 40° 49' 25" N.
Longitude 73° 46' 12" W.,

and it bears from Execution Rocks Light-house SW. $\frac{1}{2}$ S., three miles and five-eighths, and from Sands' Point Light-house SW. $\frac{1}{2}$ W. Westerly, three miles and a quarter distant. From this light-house Throg's Neck Light-house bears SW. Southerly, a mile and a quarter distant.

A bell is struck by machinery in quick succession at intervals of twenty seconds during thick weather.

Great Neck is of moderate height and almost entirely under cultivation; but the cleared fields are dotted with houses and handsome groves of trees.

Little Neck Bay is a large but shallow cove penetrating the southern shore to a distance of about two miles and a quarter, and is of no importance as an anchorage to any but vessels of very light draught,—as not more than five feet at low water can be taken into it. At its mouth it is seven-eighths of a mile wide, which width it keeps for a little over a mile above Willet's Point, or until you come abreast of the northern end of Little Neck, after which it gradually contracts, and terminates at its head in two very narrow and shallow streams.

Little Neck Bay.

Willet's Point, its western point of entrance, is a high, steep, grassy bluff, having a terraced appearance owing to a large earth-work which occupies its crest and northern slopes. At the foot of the bluff is an unfinished fortification of granite with the following warning to mariners posted conspicuously on its walls: "**Torpedoes in channel; don't anchor.**" Willet's Point is also the southern point of the eastern entrance to the East River, which separates Long Island from the mainland of New York and joins the Hudson River at the southwestern extremity of Manhattan Island.

Willet's Point.

The northern point of entrance to East River is called Throg's Neck and is easily recognized by the large granite fort and light-house on its extremity. The neck is a long projection of level grassy land, which is almost entirely occupied by the large earth-works and buildings connected with **Fort Schuyler**. The light-house stands about one hundred yards to the northeastward of the fort and is known as Throg's Neck Light-house. It is a wooden tower sixty-one feet high, painted white, and shows a fixed white light, of the fifth order, from a height of sixty-six feet above the sea, visible eleven miles. Its geographical position is

Throg's Neck and Light-house.

Latitude 40° 48' 17" N.
Longitude 73° 47' 30" W.,

and it bears from

	Miles.
Execution Rocks Light-house, SW. $\frac{1}{2}$ S.	nearly 5
Great Captain's Island Light-house, SW.	nearly 13
Sands' Point Light-house, SW. $\frac{1}{2}$ W.	4 $\frac{1}{2}$
Stepping Stones Light-house, SW. Southerly	1 $\frac{1}{2}$

From this light-house the eastern extremity of Willet's Point bears SE. $\frac{1}{2}$ S., about seven-eighths of a mile, and the light-house on The Brothers (in East River) W. $\frac{1}{2}$ N., five miles distant.

A bell-tower of conical shape and painted white stands between the fort and the light-house and contains the fog-bell, which is struck by machinery at intervals of fifteen seconds during thick weather.

The Northern Shores of Long Island Sound to the westward of Norroaton Point are exceedingly irregular in outline,—being cut up by a succession of coves and bays of more or less importance all the way to Throg's Neck. They are for the most part composed of low and gently sloping lands, diversified with woods and cultivated fields dotted with houses, and backed by a hilly country, partly cleared, but for the most part wooded.

From Norroaton Point to Long Neck Point the direction is W SW. and the distance a little over two miles and a quarter. Between the two is formed a large shallow cove full of islets and small rocks and unfit for anchorage. A narrow and shallow stream, called **Five Mile River**, empties into this cove about five eighths of a mile to the westward of Norroaton Point, but it is of no importance. The shore is for the most part low and much broken up by rocky hillocks interspersed with woods and marsh lands. Colyer's Point is about five-eighths of a mile to the westward of the mouth of Five Mile River and a mile and a quarter from Norroaton Point. It is low and wooded, with undulating surface and rocky faces to the southward, and is backed by marshy land. About one hundred and fifty yards to the southward of it lie the **Fish Islands**, two small marsh islands fringed with rocks. The eastermost and largest is of irregular shape, a quarter of a mile long N. and S., its northern half composed entirely of marsh and the southern part of grass and broken rocky ground. The western island is much smaller and is composed entirely of marsh fringed with rocks on its southern side.

Colyer's Point.

On the western side of Colyer's Point makes in a small shallow cove called **Scotch Cove**, of little importance; and thence the shore runs to the southwestward for a little over a mile to Long Neck Point. The western shore of Scotch Cove is formed by a wooded rocky island called **Great Island**, which is separated from the mainland by a narrow strip of marsh.

Long Neck Point is a smooth, gently sloping, grassy point, entirely under cultivation. It is comparatively bold-to and may be approached within six hundred yards with not less than three fathoms at low water. On its western side makes in **Darien**

Long Neck Point. or **Good Wives River**, which leads up to the village of **Darien** between low, gently sloping, cultivated banks. It is bare at low water and of very little importance. On the western side of this river is **Norroaton Neck**, which is almost entirely composed of marsh, faced with boulders and dotted at intervals with small clumps of trees. On the western side of this neck makes in a large but very shallow cove leading into **Holly's Pond**, which is

Waite and Ellis' Islands. now called **Norroaton Bay**. The western point of entrance to this cove is called **Sound View Point**; and there is a small rocky island close to it called **Waite Island**. **Ellis' Island**, or **Vincent's** as it is now called, lies about two hundred yards to the westward of Waite Island and the same distance to the southward of

Sound View Point. Both islands lie on the northern side of the entrance to **Westcott's Cove**,—a large but shallow cove embraced between **Sound View Point** and **Shippan Point**. The shore is all low and marshy, backed by cleared and cultivated lands dotted with clumps of trees.

From Long Neck Point to Shippan Point the direction is **W. by S. $\frac{1}{2}$ S.** and the distance two miles and a quarter. Shippan Point has a very gentle slope, is cleared and cultivated, dotted with a few trees, and at some distance back from the shore is crowned with a thick growth of bushy trees. All of this part of the shore from **Sheffield Island** to **Shippan**

Shippan Point. Point is very foul; and vessels should not approach **Norroaton**, **Long Neck**, and **Shippan** points nearer than a mile. The dangerous bare rocks called **The Cows** lie three-quarters of a mile to the southward of the last-named point, and there is a passage to the northward of them good for fourteen feet at low water; but it is not recommended for strangers.

From Shippan Point to Greenwich Point the direction is **W SW.** and the distance a little over two miles; but the shore-line is very irregular, running first to the northward for three-quarters of a mile to **Stamford Harbor**, at the mouth of **Mill River**, and then to the southwestward for over two miles to **Greenwich Point**.

Mill River. **Mill River.** **Stamford.** It is of little importance to navigators, as not more than three feet at low water can be carried into it; and its approaches are full of bare and sunken rocks which make it entirely unfit for strangers. The shore-line is for the most part marsh fringed with rocks, and backed by a nearly level country under fine cultivation.

Peck's Point, a flat sandy point strewn with boulders, is the western point of entrance to this river; and from it the shore runs about **SW.** for a mile and a half to **Greenwich Point**, a low and nearly level peninsula with sandy faces and grassy surface except at its western end, where there is a thick grove of trees. These mark the eastern point of entrance

Greenwich Point. to **Greenwich Cove**,—a large but shallow cove running to the northeastward between **Greenwich Point** and the mainland, and in which anchorage may be found in from six to twelve feet at low water. In approaching the point from the eastward several very prominent white houses will appear on the mainland to the northwestward of it. They form part of the village of **Greenwich**; and the most remarkable, which is a very tall building with mansard roof and two towers, is the **Americus Club House**.

The northwestern point of entrance to **Greenwich Cove** is called **Elias' Point** and separates the cove from **Mianus River**, or **Cos Cob Harbor** as it is now called, on which is situated the village of **Mianus**. This point is a mixture of marsh, cleared fields and clumps of woods; and in common with the rest of the shore between **Greenwich Point** and **Manuring Island** is not safe of approach.

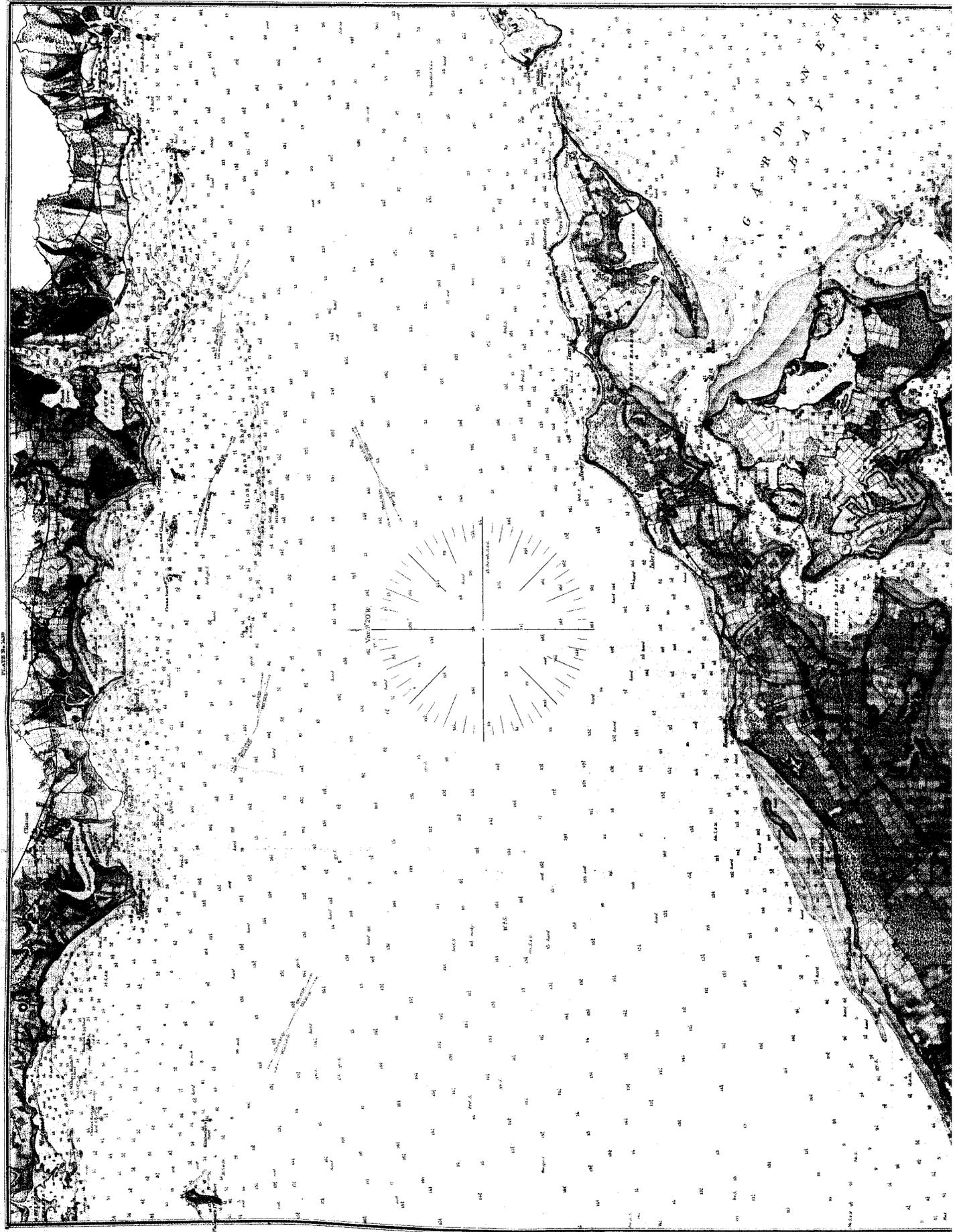
Cos Cob Harbor. **Cos Cob Harbor** is a very shallow arm of the Sound, running in a **N NE.** direction for a mile and three-quarters to the village of **Mianus**. At its mouth it is about nine hundred yards wide, but rapidly diminishes until at **Mianus** it is a mere brook. Its shores are marshy and backed by nearly level cultivated fields except on its western bank, about seven-eighths of a mile above the mouth, where a steep thinly wooded bluff projects into the river and is known as **Studwell's Point**.

From the western point of the entrance to **Cos Cob Harbor** to **Horse Neck Point** the direction is **SW. by W. $\frac{1}{2}$ W.** and the distance a mile and a half. Between the two lie the small unimportant harbors known as **Indian Harbor** or **The Chimney**

Rocky Neck. **Corner, Smith's Cove and Bush's Harbor.** Between the last named and **Indian Harbor** the land is known as **Rocky Neck**, and is composed of broken country formed by hilly wooded lands intersected by narrow marshy ravines and terminating to the southward in low, bare, level points faced with rocks. A small, flat, grassy island surrounded by rocks lies off the mouth of **Indian Harbor**, about a hundred and fifty yards from shore, and is called **Tweed's** or **Finch's Island**.

Horse Neck Point is a smooth, gently sloping, grassy point, entirely under cultivation, fringed with rocks and having clumps of trees on its eastern and western sides. The beach is strewn with boulders, and only small vessels can approach it even with experienced pilots. A little over a mile due **S.** from this point lies **Great Captain's Island**, about seven hundred yards long in an **E. and W.** direction and easily recognized by the light-house on its western end. This light-house will appear as a grey dwelling surmounted by a white lantern,—the

Great Captain's Island Light-house.



whole perched on a dark-looking hill with perpendicular faces of a yellowish-white appearance. It is forty-six feet high and shows a fixed white light, of the fourth order, from a height of seventy-four feet above sea-level, visible fourteen miles. Its geographical position is

Latitude 40° 58' 55" N.
 Longitude 73° 37' 26" W.,

and it bears from

Norwalk Light-house, W. by S. $\frac{3}{4}$ S.	a little over 10	Miles.
Middle Ground Light-house, W. $\frac{1}{4}$ S.	24	
Old Field Point Light-house, W. $\frac{1}{2}$ N.	22 $\frac{1}{4}$	
Eaton's Neck Light-house, W. by N. $\frac{3}{4}$ N.	about 10 $\frac{1}{4}$	

From this light-house

Sands' Point Light-house bears SW. $\frac{1}{4}$ S. Nearly	about 8 $\frac{3}{4}$	Miles.
Throg's Neck Light-house SW.	nearly 13	
Execution Rocks Light-house SW. $\frac{1}{4}$ W.	a little over 8	

There is no fog-signal.

Great Captain's Island is composed of two grassy hills about five-eighths of a mile apart and united by a narrow strip of sand. The western hill, on which the light house stands, is the highest,—being thirty feet above sea-level, with precipitous faces to the southward. The eastern hill is lower, rising with a very gentle slope from E. to W. and terminating in low cliffs on its western side. The island is surrounded by a sand beach strewn with innumerable boulders, and is joined to Little Captain's Island (about five-eighths of a mile to the eastward) by a line of very dangerous reefs.

Great Captain's Island.

Little Captain's Island is formed by two very small islets joined at low water by a sand beach strewn with boulders. The easternmost islet is about seventy-five yards long, with nearly level grassy surface and perpendicular faces to the southeastward. The western islet, which is about two hundred yards from the former, is a mere ridge of sand about one hundred and seventy-five yards long, surrounded by shoals and bare and sunken rocks. Dangerous ledges extend to the eastward from Little Captain's Island for about nine hundred yards; but there is a good passage to the eastward of these, leading to a comfortable anchorage with from two to five fathoms to the northward of the island, and known as **East Harbor**. Anchorage may also be found in from two to four fathoms on the northern side of Great Captain's Island, between it and The Calves, or the **Calf Islands** as they are sometimes called. These are three grassy islands with perpendicular faces fringed with rocks, and joined to each other at low water by sand and salt-meadow. The northernmost is about an eighth of a mile from the northern shore and three-quarters of a mile to the westward of Horse Neck Point. It is faced by rocks surrounded by a beach strewn with boulders, and connected on the south, by a strip of bare sand two hundred yards long with the salt-meadow, which in turn joins it to the two southern islands. Of these latter the easternmost is about twenty feet high, nearly round, about two hundred yards in diameter, and shows perpendicular faces to the southward. A narrow strip of sand about one hundred yards long connects it with the southernmost island, which is about three hundred yards long N. and S., with gently sloping grassy surface and perpendicular faces about ten feet high on its southern side. Both islands are skirted by a sand beach strewn with boulders; and a dangerous reef, for the most part bare at low water, makes to the southward from the southernmost island for a quarter of a mile.

Little Captain's Island.

The Calves.

About four hundred and fifty yards to the eastward of the easternmost of The Calves, and eight hundred and fifty yards to the southwestward of Horse Neck Point, lies a small sandy islet, surrounded by marsh and boulders, called **Bowers' Island**. There is no passage between any of these islands and the mainland.

From Horse Neck Point to Byram Point the direction is W SW. and the distance one mile and five-eighths. The shoreline is very irregular,—being indented by a large shallow cove skirting the west shore of **Horse Neck**. It is rocky and bare of trees and the country behind it is very much broken,—being composed of innumerable rocky ridges, crowned with bare ledges and separated by narrow ravines. The land rises in regular terraces to the northward of these ridges and is for the most part under cultivation and well settled.

Byram Point is formed by a low rocky islet about two hundred yards long, very gently sloping and bare of trees. It is connected with the mainland by a narrow strip of marsh and sand faced with rocks, and a bare rocky ledge extends from it to the southward for about two hundred yards. It is the eastern point of entrance to a shallow stream, called **Byram River**, upon which is situated the village of **Port Chester**, three-quarters of a mile above its mouth. The eastern banks of this river present a very broken outline,—being composed of a great number of bare hillocks, while the western shores, though hilly and undulating, are for the most part under cultivation and well settled. Its banks are a succession of wooded and bare hillocks interspersed with marsh lands.

Byram Point.

On the western side of the entrance to Byram River the shore spreads away to the southwestward into a large shallow cove about three-quarters of a mile long and terminating in a very narrow and shallow stream, separating Manorsing Island from the mainland. It is of no importance,—being for the most part bare at low water and having its entrance barred by very dangerous reefs.

Manursing Island lies about **N NE.** and **S SW.** and is about a mile long. At its northeastern end it has perpendicular faces and grassy summit, destitute of trees except near the centre, where there are some thick clumps. The rest of the island is lower than the northeastern extremity, slightly undulating, but nearly level, and is in reality composed of several islands of firm ground separated by marsh. There are several houses on the island and a few trees on its southern end close to the edge of the bank. Its approaches are shoal and vessels should give its southern end a berth of not less than half a mile.

From the southern end of **Manursing Island** to **Parsonage Point** the direction is **SW.** and the distance a mile and five-eighths,—the shore between the two points forming a large shallow cove full of bare and sunken ledges. **Rye Neck.** The land is of moderate height, undulating, and diversified with woods and cultivated and settled lands. **Rye Neck**, which forms the western shore of this cove, is also of moderate height, with nearly level surface, fringed with rocks, and its summit covered with tall trees. Long rocky ledges surround it, (many of them bare at all times,) and vessels must not approach **Rye Point**, its southwestern extremity, nearer than three-quarters of a mile.

Parsonage Point, the southeastern extremity of the neck, is low and nearly level, bare of trees, faced with rocks and fringed with boulders. It is also dangerous of approach owing to long reefs extending from it to the southward, and should receive a berth of not less than a quarter of a mile. The Sound at this point is quite narrow,—being only about three miles and a quarter wide between **Parsonage** and **Maticock** points,—and hence to the westward the northern and southern shores gradually approach each other until the mouth of the **East River** is reached.

Rye Point, the southwestern extremity of the neck, is formed by a series of flat wooded islets separated by marsh; and from it a line of bare reefs and rocky islets extends to the southwestward about six hundred and fifty yards, terminating in a ragged-looking mass of rock known as **The Scotch Caps**.

On the western side of **Rye Neck** makes in **Mill Creek**, on which are situated the villages of **Rye** and **Milton**,—the latter about a mile and the former two miles and a half above its mouth. It is shallow and of no commercial importance. At its entrance it is a third of a mile wide, but a little over a mile above its mouth it suddenly contracts to a mere brook flowing between marshy banks, backed by beautifully cultivated and nearly level lands. **Hen Island**, its western point of entrance, is the southern end of a long marshy point dotted with similar islets, and the eastern point of a large cove into which empties **Mamaroneck River**. Between this island and **Delancey's Point** the entrance to the cove is about a mile wide, but it is quite shoal,—only four feet at low water being found as far as the mouth of **Mamaroneck River**. The shores of the cove are low and nearly level, faced with rocks, and their surface diversified with thick woods, cultivated fields and ornamental grounds, and dotted with houses. The river banks are fringed with marsh, and the village of **Mamaroneck** is situated on its eastern side about three-quarters of a mile above its mouth.

About five-eighths of a mile to the southward of the mouth of the river is **Delancey's Point**, low, grassy and nearly level, and crowned with a thick clump of trees. It is fringed with a sand beach strewn with boulders, and must not be approached nearer than half a mile on account of a long reef making off from it in a southeasterly direction. To the southwestward the shore extends into a long, flat, sandy point covered with grass and marsh and known as **Long Beach Point**.

On the western side of this point makes in a large but shallow cove called **Delancey's Cove**. It lies **N.** and **S.**, is about half a mile long, between eight and nine hundred yards wide, has many bare rocks in it, and is nearly bare at low water. Its western shores are low, nearly level and rocky, with clumps of trees at intervals, but the most of the land is grassy and under cultivation.

From **Delancey's Cove** the shore runs about **SW.** by **W.** for a little over a mile to **Premium Point**, a low, flat, rocky point, for the most part wooded, but terminating in marshy land fringed with rocks. The country in the background is somewhat undulating, but low and diversified with cultivated fields, ornamental grounds and thick woods, and dotted with clusters of houses. Abreast of this point the Sound is only about two miles and three-quarters wide.

On the western side of **Premium Point** makes in a shallow cove about half a mile in diameter, called **Kellogg's Cove**, of little importance. Its western shores are formed by **Davenport's Neck**, abreast of which begins the labyrinth of islands which extends nearly to **Throg's Neck** and very sensibly diminishes the available width of the Sound. The village of **New Rochelle** is situated about five-eighths of a mile inland from the western shore of this cove and its thickly clustered houses are occasionally visible to vessels passing through the Sound.

Davenport's Neck lies nearly **NE.** and **SW.** and is about one mile long. It is composed entirely of cultivated lands somewhat higher than the adjacent shores, but having a very gentle slope. It is fringed with beach and marsh alternately,—the former being strewn with boulders,—and it terminates at its southwestern end in a sandy hillock with a few trees on it. Between this southwestern end and the eastern extremity of **Looust Island** is the entrance to **New Rochelle Harbor**, which is here only sixty yards wide. A rocky islet about two hundred yards long, called **Pine Island**, lies close in with the eastern shore of the neck, about a quarter of a mile to the southward of the entrance to **Kellogg's Cove**; and about a quarter of a mile to the southeastward of this is a dangerous reef about three hundred and fifty yards in diameter and bare at low water, called **Middle Shoal**. From three to five fathoms at low water may be taken between this reef and **Pine Island**; but neither this nor any other of the channels on the northern side of the Sound should be used by strangers.

About eight hundred yards to the southward of the dry part of Middle Shoal and nearly a mile **NW.** from the light-house on Execution Rocks lies Whortleberry Island, low and nearly level, faced with rocks and covered with grass except at its southern end, where there is a thin grove of low bushy trees. A few tall single trees dot the surface of the island at long intervals, and on its northeastern end two trees stand close together. There are numerous outlying rocks,—especially to the westward of the island,—the whole space between it and Davenport's Island being full of ledges.

**Whortleberry
Island.**

Davenport's Island is three-eighths of a mile to the westward of Whortleberry Island, and its northern end is about a quarter of a mile to the southward of the shore of Davenport's Neck. It lies nearly **N.** and **S.**, is about nine hundred yards long with an average width of four hundred yards, and when viewed from the eastward appears rocky and thickly wooded, with several houses and a tall flag-staff appearing among the trees. It is fringed with marsh, beach and rocks alternately,—the beach being strewn with boulders and the marsh edged with ledges. It is not safe to approach it without a pilot owing to the innumerable ledges and bare rocks which lie to the eastward and southeastward of it; but, with a good pilot, anchorage may be found on its western side in from eight to five fathoms at low water.

**Davenport's
Island.**

Davenport's Island was formerly called **Hewlett's Island**, but of late years has been locally known as **David's Island**.

About half a mile **SSW.** from Whortleberry Island and three-eighths of a mile to the southeastward of Davenport's Island lies Pea Island, which is also a mile to the westward of Execution Rocks. It is low, flat, covered with scrub and surrounded by rocks, and must not be approached from the eastward or southward nearer than a quarter of a mile. A channel with not less than three fathoms leads along its northern side, between it and the bare ledges between Davenport's and Whortleberry islands; but, like the numerous other channels among these islands, must not be attempted by strangers.

Pea Island.

New Rochelle Harbor is a narrow sheet of shoal water contained between the northern shore of the Sound and Davenport's Neck. It cannot, of course, be entered by strangers, and owing to the contracted limits of the channel its navigation is confined almost exclusively to steamers and barges. The entrance, which is about sixty yards wide, is between Davenport's Neck and Locust Island; but the village is not upon the banks of the harbor but about half a mile inland.

**New Rochelle
Harbor.**

Locust Island lies **NE.** and **SW.**, is about half a mile long, and for the most part composed of marsh. Its northeastern extremity, however, which is the western point of entrance to New Rochelle Harbor, is formed by a wooded hill of moderate height with precipitous faces to the eastward; and there are several smaller wooded hillocks scattered over the surface of the island. It lies close in with the northern shore, being in no place more than one hundred and fifty yards from it, and there is no safe passage inshore of it. It is about seven hundred yards to the westward of Davenport's Island; but there are many bare ledges and rocks between the two, and it is not safe for strangers to attempt to pass through without a pilot.

Locust Island.

Hunter's Island lies just to the southwestward of Locust Island and about two hundred yards from the northern shore of the Sound, with which it is connected by a causeway. It is of moderate height with a very gentle slope, and is entirely under cultivation except at its northern and eastern ends, where there is a fringe of trees. It lies **NE.** by **N.** and **SW.** by **S.**, is about three quarters of a mile long and half a mile wide, and is surrounded by marsh, which extends to the northward from the firm ground to within one hundred yards of Locust Island. Near its southeastern end it is joined by a causeway to two rocky wooded islets surrounded by marsh and called **The Twins**. Between these and Davenport's Island there is good anchorage in from eight to eleven feet, sticky bottom, but it is not safe for strangers.

Hunter's Island.

About half a mile **E.** by **S.** from The Twins and between eight and nine hundred yards **WSW.** from Pea Island lies an islet of bare rock about three hundred yards long **NW.** and **SE.**, and surrounded by a dangerous reef called **Middle Reef**, extending to the southward to within about a quarter of a mile of Hart Island. It has no name, but is a serious obstruction, as it almost closes the otherwise wide passage between Davenport's and Hart islands. Channels with not less than three fathoms at low water are found on both sides of it, but they are not safe for strangers.

Hart Island lies nearly **N.** by **E.** and **S.** by **W.** and is nearly a mile long. Its southern end bears from Sands' Point Light-house **SW.** by **W.** $\frac{1}{4}$ **W.**, two miles and an eighth, and from Execution Rocks **SW.** southerly, two miles and three-eighths distant. When seen from the eastward it is unmistakable on account of the low, flat-roofed, yellowish buildings, having the appearance of a line of cars, which stand upon its northeastern end,—some of them projecting out over the water and supported by piles. It has a tolerably level surface, but is highest at its northeastern end, and there are scattered trees here and there. About midway between its northern and southern ends is seen a similar row of one-story flat-roofed houses, which, together with those on the northeastern end, are used as quarters for the boys of the **Reform School-Ship**. The southeastern part of the island is level and sandy, with perpendicular faces, behind which appear dark woods. The island terminates to the southward in a bare grassy bluff about twenty feet high, and is here comparatively bold-to,—five fathoms being found at low water within an eighth of a mile.

Hart Island.

City Island lies half a mile to the westward of Hart Island, and between the two there is an excellent harbor of refuge, in which anchorage may be found in from nine feet to ten fathoms, well sheltered. There are no obstructions, and the harbor is therefore easy of access even to strangers. City Island lies **N.** and **S.** and is about a mile and a quarter long. It is of moderate height, somewhat undulating, with steep sandy faces, and

City Island.

thickly dotted with houses and groves of trees except at its northern end, which is bare. To the southward it extends into a long, low, level point on which is a grove of bushy trees. A dangerous rock, known as **Big Tom**, lies about six hundred yards to the westward of this southern end, obstructing the entrance to Pelham Bay and Hutchinson's River.

Off the eastern shore of City Island, near its northern end, and at distances from it of five and seven hundred yards, respectively, lie two islets known as Green Flat and Rat islands. The former, which is the westernmost, is a mere marshy flat about a hundred yards in diameter; while the latter is a bare rock, between sixty and seventy yards long, marking the western boundaries of the passage between Hart and City islands. There is no passage between them or inshore of them; but Rat Island may be approached on its eastern side within fifty yards with not less than four fathoms at low water.

High Island. *About two hundred yards E. by N. from the northern end of City Island lies a small sandy island called High Island. To the northward, eastward and southward it shows precipitous faces, and its summit has a few scattered trees and houses upon it. Nearly three hundred yards to the northeastward of it lies a group of bare rocky islets, known as **The Chimney Sweeps**, which are also bold-to on their eastern side, and may be approached within less than one hundred yards with not less than four fathoms water. They obstruct also the approach to **Morris' Cove**, which makes in on the southern side of Hunter's Island, between it and Pelham Neck. Anchorage in from eight to ten feet at low water may be found in this cove, but the approach is so obstructed as not to be safe for strangers.*

Pelham Neck. *Pelham Neck is a peninsula about a mile and a quarter long in a N. by E. and S. by W. direction, and rises with a very gentle slope to a height of sixty feet above sea-level. There is a small clump of trees at its northern end, but the rest of the neck is under cultivation and has several houses upon it. Marsh fringed with rocks surrounds it, and a channel about an eighth of a mile wide, with twelve feet at low water, separates it from City Island. Pelham Neck was formerly called **Rodman's Neck**.*

Pelham Bay. *On the western side of Pelham Neck, between it and the mainland of Westchester, lies Pelham Bay, into which empties Hutchinson's River, which leads up to the village of East Chester. Although five-eighths of a mile in width at its mouth this bay is only good for six feet navigation, and strangers must under no circumstances attempt to enter it. Its shores are low on both sides and almost entirely under cultivation.*

Hutchinson's River is a very narrow and shallow stream, which leads from this bay with many tortuous windings to **East Chester**, about two miles and a quarter to the northward. Its shores are mostly low and marshy, but backed by cultivated lands thickly dotted with houses.

Locust Point. *From the entrance to Pelham Bay the shore has a general course about S SE. for two miles and a half to the southern extremity of Throg's Neck, passing the village of **Schuylerville** (which is situated about half a mile to the southward of the entrance to the bay) and **Locust Point**, a projection of low level land, partly wooded and partly marsh, about five-eighths of a mile to the northward of Fort Schuyler. All of this part of the shore is shoal in its approaches, but for light-draught vessels excellent anchorage may be found in from eight to ten feet at low water anywhere between Locust Point on the west and City Island and Pelham Neck on the north and east.*

Throg's Neck has been already described on page 369.

DANGERS

IN APPROACHING, ENTERING AND PASSING THROUGH LONG ISLAND SOUND.

I. By the Main Channel, having come from Vineyard Sound or Buzzard's Bay.—The course from Vineyard Sound to the main entrance to Block Island Sound is W. Southerly until Block Island North Light-house bears S. $\frac{1}{4}$ W., a little over three miles distant. On this course there are no dangers; but if the wind be foul and the vessel be obliged to beat she should not, when to the westward of Point Judith, stand farther to the northward than to bring Point Judith

Squid Ledge. Light-house to bear E. by N. $\frac{1}{4}$ N. This bearing avoids Squid Ledge, a narrow rocky shoal lying in the bight on the western side of Point Judith Neck, with thirteen feet water upon it. It extends nearly N. and S., is three-quarters of a mile long, and has from three to five fathoms on all sides of it. Its southern end bears from Point Judith Light-house W. $\frac{1}{4}$ S., one mile and a half distant.

It may be remarked, in this connection, that when well clear of Squid Ledge to the westward, (say about three miles from Point Judith,) you may safely stand to within three-eighths of a mile of the northern shore, with not less than six fathoms, until nearly up with Watch Hill Point. A good rule is to go about when Point Judith Light-house bears E. $\frac{1}{4}$ N., or Watch Hill Light-house W. $\frac{1}{4}$ S.

On the southern side of the Sound, when near Block Island, look out for Block Island North Reef, sometimes called **Sandy Point Reef**. This is a very dangerous rocky ledge making off in a northerly direction for nearly a mile from Sandy Point,—the northwestern extremity of Block Island. Soundings on the reef vary from two to twelve feet, and a depth of five feet is found seven-eighths of a mile to the northward of the light-house. A black nun-buoy* of the second class, marked No. 1, is placed in four fathoms close to the northern end of the reef, and bears from Block Island North Light-house N. $\frac{1}{4}$ E., nearly a mile

THE FOLLOWING INFORMATION WAS RECEIVED AFTER THIS VOLUME HAD GONE TO PRESS.

The Light-house Board, under date of April 15, 1881, has given notice that a "Whistling Buoy," painted red and black in horizontal stripes, has replaced the can-buoy on Cerberus Shoal. This buoy is anchored in seven fathoms about two hundred and fifty yards **E SE.** from the shoal, and on the following bearings:

	Miles.
Montauk Point Light-house, SE. by S. $\frac{5}{8}$ S. Southerly -----	7 $\frac{1}{8}$
Watch Hill Light-house, NE. $\frac{5}{8}$ N. -----	8 $\frac{3}{8}$
Race Rock Light-house, NW. $\frac{3}{4}$ N. -----	5 $\frac{1}{8}$
Gardiner's Island Light-house, W. $\frac{1}{4}$ S. -----	8 $\frac{3}{8}$
Little Gull Island Light-house, NW. by W. $\frac{3}{4}$ W. -----	7 $\frac{1}{8}$

and a half, and from Point Judith Light-house SW. $\frac{1}{4}$ S. Nearly, about eight miles distant. From this buoy

	Miles.
Watch Hill Light-house bears W NW. Northerly	13 $\frac{1}{4}$
The buoy on Cerberus Shoal W. $\frac{1}{2}$ S.	17 $\frac{3}{4}$
Race Rock W. $\frac{3}{4}$ N.	21 $\frac{1}{4}$
The buoy on Valiant Rock W. $\frac{1}{2}$ N.	22 $\frac{3}{8}$
Little Gull Island Light-house W. $\frac{3}{8}$ N. ----- a little over	24
The buoy on Shagwong Reef W. by S. $\frac{1}{2}$ S. Southerly	17 $\frac{1}{2}$
Montauk Point Light-house SW. by W. $\frac{1}{4}$ W.	16 $\frac{3}{4}$

When to the westward of Block Island there are no dangers in the channel; but if standing to the northward on a wind you must be careful, when in the vicinity of Watch Hill Point, not to approach nearer than three-quarters of a mile to avoid the dangerous Watch Hill Reef, a large detached shoal, dry in places at low water, and lying on the southern side of the Watch Hill Passage into Fisher's Island Sound,—its northern end being six hundred yards from the light-house. The ledge lies nearly NE. by N. and SW. by S., is about seven hundred and fifty yards long, and the dry part, which is near its southern end, is marked by a spindle of iron surmounted by a square cage, and bearing from

*Watch Hill
Reef.*

Watch Hill Light-house, SW. by S. Southerly	1150 yards.
Point Judith Light-house, W. $\frac{1}{4}$ S. Southerly	nearly 18 miles.
Block Island North Light-house, NW. by W. $\frac{3}{8}$ W. ----- a little over	13 $\frac{1}{2}$ "

From this spindle the buoy on Valiant Rock bears W. by S. $\frac{3}{8}$ S., a little over ten miles, and Little Gull Island Light-house W. by S. $\frac{1}{2}$ S., a little over twelve miles distant. About three hundred yards E. by N. $\frac{3}{4}$ N. from this spindle is placed a black nun-buoy* of the second class (No. 1) to mark the southeastern end of the reef.

A good rule for avoiding Watch Hill Reef is not to shut in Race Rock Light-house behind the southern point of Fisher's Island, or, in other words, to go about as soon as that light-house bears W. $\frac{3}{4}$ S. Another rule is not to approach Watch Hill Light-house nearer than three-quarters of a mile or not to go inside of eleven fathoms.

In standing to the southward on a wind you must beware, when to the westward of the longitude of Montauk, of Cerberus Shoal, sometimes called *The Middle Ground*. This is a detached shoal about an eighth of a mile in diameter between the lines of three fathoms, *Cerberus Shoal*, and has thirteen feet upon it at low water. Its shoalest part is five miles and an eighth S. by E. Easterly from the southern point of Fisher's Island, (abreast of Prospect Hill,) and five miles and three-quarters N. by W. $\frac{1}{2}$ W. from Shagwong Point, near the eastern extremity of Long Island. A can-buoy* of the second class, painted red and black in horizontal stripes, is placed in three fathoms close to the eastern edge of the shoal. It bears from

	Miles.
Watch Hill Light-house, SW. $\frac{5}{8}$ S. ----- nearly	9
The black buoy on the northern end of Block Island North Reef, W. $\frac{1}{2}$ S. ----- about	17 $\frac{3}{4}$
The black buoy on Shagwong Reef, N. by W. $\frac{3}{4}$ W. -----	4
Montauk Point Light-house, NW. by N. $\frac{1}{2}$ N. -----	7 $\frac{1}{2}$

From this buoy

	Miles.
Race Rock Light-house bears NW. $\frac{3}{4}$ N. ----- a little over	5 $\frac{3}{4}$
The middle of The Race NW. by W. $\frac{1}{8}$ W. -----	6 $\frac{1}{2}$
Little Gull Island Light-house NW. by W. $\frac{3}{4}$ W. ----- about	7
Gardiner's Island Light-house W. $\frac{3}{8}$ S. -----	8 $\frac{3}{4}$

To avoid Cerberus Shoal when in its vicinity do not stand to the southward of Gardiner's Island Light-house bearing W. $\frac{1}{4}$ S., or Little Gull Island Light-house bearing W NW.

When approaching The Race with a fair wind look out for Valiant Rock, a detached shoal, with seventeen feet at low water, lying almost exactly midway between Race Point and Little Gull Island,—being nearly two miles to the southwestward of the former and a little over two miles to the northeastward of the latter. It is of small extent,—being about one hundred *Valiant Rock.* and fifty yards in diameter,—and has deep water all around it. A nun-buoy* of the first class, painted red and black in horizontal stripes, is placed on the southwestern side of the rock, and the sailing-lines pass to the southward of it. The velocity of the tide in The Race is, however, so great that it is difficult to keep this buoy in position, and mariners must, therefore, depend more upon the landmarks and ranges than upon the position of the buoy.

The Marks for Valiant Rock are as follows: Morgan's Point Light-house will be seen just open to the northward of North Hill, (on Fisher's Island,) bearing about NE. $\frac{1}{4}$ N.; New London Light-

house will be on with the gap in Bolles' Hill, (N. of New London,) bearing due N.; Little Gull Island Light-house will be open a little to the southward of Great Gull Island on a bearing of SW. by W. $\frac{3}{4}$ W.; and the southern point of Fisher's Island (abreast of Prospect Hill) will be in range with the southeastern or most distant point of the island.

The buoy on Valiant Rock bears from

	Miles.
Race Rock Light-house, SW. $\frac{3}{8}$ W.-----	1 $\frac{1}{2}$
The spindle on Watch Hill Reef, W. by S. $\frac{3}{8}$ S.-----	a little over 10
The black buoy on the northern end of Block Island North Reef, W. $\frac{1}{2}$ N.-----	22 $\frac{3}{4}$
The buoy on Cerberus Shoal, NW. $\frac{1}{2}$ W.-----	nearly 6
Montauk Point Light-house, NW. $\frac{3}{4}$ N.-----	about 13 $\frac{1}{2}$

From this buoy

	Miles.
Little Gull Island Light-house bears SW. by W. $\frac{3}{4}$ W.-----	2
Gardiner's Island Light-house SW. $\frac{1}{4}$ S. Nearly-----	about 6
Bartlett's Reef Light-vessel NW. $\frac{1}{2}$ N.-----	3 $\frac{3}{4}$
New London Light-house N.-----	5 $\frac{1}{2}$
Cornfield Point Light-vessel W. $\frac{3}{4}$ N.-----	14 $\frac{1}{2}$

Vessels may pass on either side of Valiant Rock, but it is usual to pass to the southward of it. The velocity of the current is from three to five knots under ordinary circumstances, but reaches six knots during spring tides.

On the southern side of the entrance, and within a few hundred yards of Little Gull Island, will be seen a black nun-buoy* of the second class. This marks the eastern extremity of Little Gull Island Reef, which is bare at extreme low tides and makes out in a WNW. direction from the island for about three hundred yards. The buoy, which is marked No. 1, is placed in sixteen feet at low water, and bears from

The buoy on Valiant Rock, SW. by W. $\frac{3}{4}$ W.-----	1 $\frac{1}{2}$ miles.
Race Rock Light-house, SW. by W. $\frac{1}{4}$ W.-----	3 $\frac{1}{4}$ "
Little Gull Island Light-house, E. by N.-----	400 yards.

From this buoy Bartlett's Reef Light-vessel bears N. $\frac{3}{4}$ W. Westerly, three miles and three-quarters, and Cornfield Point Light-vessel W. by N. $\frac{1}{4}$ N., thirteen miles distant.

When past this buoy you are fairly in Long Island Sound and the channel is clear, but if standing to the northward on a wind you must beware of Bartlett's Reef, a very dangerous shoal on the northern side of the Sound, off the mouth of Whitestone Creek. It extends S. by E. for a mile and a quarter and has upon it many rocks bare at low water. Its northern end bears W. $\frac{1}{4}$ S. from Goshen Point, a mile and a quarter distant, and has upon it a black spar-buoy, marking the southern side of Two Tree Island Channel. Its southern end bears from Goshen Point SW. $\frac{1}{2}$ S., about a mile and three-quarters, and from Race Rock Light-house NW. by W., four miles and a quarter distant. Here is placed a red spar-buoy, marked No. 4, in three fathoms water; and three-eighths of a mile to the southward of this will be seen a light-vessel with two masts. This light-vessel is known as Bartlett's Reef Light-vessel, and is the principal guide to Fisher's Island Sound from the westward and to the North Channel of Long Island Sound from the eastward. The hull is painted black with a white streak, and the words "Bartlett's Reef" in large letters on each side. In day-time the vessel shows two circular day-marks and at night two fixed white lights from a height of twenty-eight feet above sea-level, visible ten miles. Its approximate geographical position is

Latitude-----	41° 15' 58'' N.
Longitude-----	72° 7' 35'' W.,

and it bears from Race Rock Light-house NW. by W. $\frac{1}{4}$ W., four miles, and from Little Gull Island Light-house N. $\frac{1}{2}$ W., three miles and three-quarters distant. From this light-vessel

	Miles.
New London Light-house bears NE. $\frac{3}{8}$ N.-----	about 3 $\frac{1}{2}$
Saybrook Light-house W. $\frac{1}{4}$ N.-----	9 $\frac{1}{4}$
Cornfield Point Light-vessel W. $\frac{1}{4}$ S.-----	12
Plum Island Light-house SW. $\frac{1}{4}$ S.-----	6 $\frac{3}{4}$

A bell is struck and a horn sounded on this vessel during thick weather.

A channel three-eighths of a mile wide with not less than seven fathoms water exists between Bartlett's Reef Light-vessel and the red buoy on the southern end of the reef, and is sometimes used by vessels bound through the North Channel.

When to the westward of Bartlett's Reef it is not usual for vessels to stand farther to the northward than to bring the light-vessel to bear **E. $\frac{1}{4}$ N.**, or Cornfield Point Light-vessel **W. $\frac{1}{4}$ S.** But it is safe in day-time to stand well to the northward of the former, say until Black Point bears **W.** and you are nearly in line between it and Two Tree Island. When to the westward of Black Point, however, you should not stand farther to the northward than to bring that point to bear **E. by N. $\frac{3}{8}$ N.**

Dangers--Main Channel.

In standing to the southward you should not approach the northern shores of Great Gull Island and Plum Island nearer than half a mile;—not that there are any shoals, but to avoid being sucked by the strong current into the dangerous passage between those islands. (See also page 346.) There are also *two dangerous sunken rocks* off the northern shore of Plum Island, exactly midway between its eastern and western ends, which must be avoided by vessels standing to the southward in this vicinity. The outermost, which has *nine feet* at low water, is a hundred and fifty yards from shore, and the inner rock, which has *six feet*, is fifty yards inside of it. They are not buoyed, but are easily avoided in day-time by not approaching the island nearer than half a mile, and at night by not standing to the southward of Little Gull Island light bearing **E.**

On the northern shore of the Sound, when in the vicinity of Black Point, do not approach it from the southward nearer than half a mile; and when to the westward of it, beware of standing into the light on account of the dangerous Black-boy Rock, which extends **N. by E. and S. by W.** for nearly six hundred yards and is bare in places at low water. Its southern end bears **W. $\frac{1}{2}$ S.** from Black Point, distant three-quarters of a mile, and is marked by a red spar-buoy (No. 4) placed in three fathoms water. From this buoy the red buoy on the southeastern end of Hatchett's Reef bears **W. by S. $\frac{1}{2}$ S.**, two miles distant.

Black-boy Rock.

Black-boy Rock receives its name from **The Black-boys**,—two rocky islets a quarter of a mile to the northward of its northern end and off the mouth of Pattaguansett River. (See also page 348.) To avoid it do not stand to the northward of Black Point bearing **E. by N. $\frac{3}{8}$ N.**

The above bearing also avoids Hatchett's Reef, which is the eastern extremity of that extensive area of shoal ground which surrounds the mouth of Connecticut River. The reef itself lies off Hatchett's Point,—its northern end being five-eighths of a mile **S SW. Hatchett's Reef.** from that point. This northern end is marked by a black spar-buoy (No. 1), which defines the southern limits of the passage between it and the point. The southern end of the reef bears **W. by S. $\frac{1}{2}$ S.** from Black Point, distant two miles and three-quarters, and **W. $\frac{1}{4}$ N.** from Bartlett's Reef Light-vessel, distant a little over six miles. It is marked by a red spar-buoy (No. 6) placed in sixteen feet water. The passage to the northward of the reef is not safe and is rarely used, though it has as much as seven fathoms in some parts.

From the red buoy on the southern end of Hatchett's Reef the red can-buoy* on the southern extremity of Saybrook Bar bears **W. by S.** about two miles and a half distant. This bar is very dangerous to vessels using the North Channel of Long Island Sound, and it makes to the southeastward from Lynde's Point for a mile and three-quarters and to the southward from New Breach Point for a mile and a half. The depths on it vary from four to nine feet at low water. The buoy is marked No. 8 and placed in eighteen feet water,—Cornfield Point Light-vessel bearing **W. by S. $\frac{1}{4}$ S.**, three miles distant. Vessels beating through the Main Channel avoid this bar, as well as Long Sand Shoal, by going about as soon as Cornfield Point Light-vessel bears **W. $\frac{1}{4}$ S.**

Saybrook Bar.

Long Sand Shoal is an extensive sand bar lying nearly **E. and W.** and five miles and a quarter long, but is comparatively narrow,—its greatest width not exceeding a quarter of a mile. Its eastern extremity is nearly two miles **S. by E. $\frac{3}{4}$ E.** from Saybrook Light-house and five-eighths of a mile **SW. $\frac{1}{4}$ W.** from the red can-buoy on the southern end of Saybrook Bar,—the last-named distance being the width of the North Channel at this point. The western end of the shoal bears **SW. by W. $\frac{1}{4}$ W.** from Cornfield Point, distant three miles, and **W. by N.** from Cornfield Point Light-vessel, distant two miles and a quarter; and here is placed a nun-buoy* of the second class, painted red and black in horizontal stripes. From this buoy Falkner's Island Light-house bears **W. $\frac{1}{4}$ N.**, nine miles and three-quarters distant.

Long Sand Shoal.

A spar-buoy, also painted red and black, is placed on the shoal at its eastern end to mark the southern side of the entrance to the North Channel.

About an eighth of a mile from the southern edge of Long Sand Shoal and nearly midway of its length is placed a sloop-rigged light-vessel known as Cornfield Point Light-vessel. It is painted red, with the words "*Cornfield Point*" in white letters on each side, and shows during the day a square cage day-mark painted red, and at night a fixed red light, from a height of forty feet above the sea, visible twelve miles. Its approximate geographical position is

Cornfield Point Light-vessel.

Latitude ----- 41° 18' 32'' N.
Longitude ----- 72° 23' 17'' W.

Cornfield Point Light-vessel bears from

	Miles.
Saybrook Light-house, SW. $\frac{1}{8}$ W. -----	3 $\frac{5}{8}$
Bartlett's Reef Light-vessel, W. $\frac{1}{4}$ S. -----	12
Race Rock Light-house, W. $\frac{1}{2}$ N. -----	15 $\frac{1}{2}$
Little Gull Island Light-house, about W. by N. $\frac{1}{4}$ N. -----	nearly 13
Plum Island Light-house, NW. by W. $\frac{3}{8}$ W. -----	8 $\frac{1}{2}$

From this light-vessel

	Miles.
Falkner's Island Light-house bears W. $\frac{1}{2}$ N. -----	12
Horton's Point Light-house SW. by S. $\frac{5}{8}$ S. -----	nearly 9
Middle Ground Light-house (Stratford Shoal) W. $\frac{3}{4}$ S. Nearly -----	33 $\frac{1}{2}$

A bell is rung and a horn sounded on this vessel during thick weather.

To avoid Long Sand Shoal: When to the eastward of the light-vessel go about as soon as it bears W., and when to the westward of it do not stand to the northward of Falkner's Island Light-house bearing W. $\frac{3}{4}$ N.

The southern shore of the Sound to the westward of Plum Gut is comparatively bold-to and may be safely approached within a quarter of a mile until you have passed to the westward of Brown's Hills, when it becomes necessary to look out for Orient Shoal, which lies about midway between Terry's and Rocky points and about five-eighths of a mile to the northward of Truman's *Orient Shoal*. Beach. It is a sand shoal, lying E. by N. and W. by S., about half a mile long, and has six feet at low water on its shoalest part. Three hundred yards E. NE. from this shoal spot is placed a black spar-buoy (No. 3) in eighteen feet water,—Plum Island Light-house bearing E. $\frac{1}{2}$ N. and open a little to the northward of Mulford's Point. To avoid this shoal do not, when in its vicinity, go to the southward of Plum Island Light-house bearing E. $\frac{1}{4}$ N., or should the light not be visible do not go inside of twelve fathoms.

To the westward of Rocky Point the southern shore of the Sound is comparatively bold-to and may be safely approached within half a mile until Horton's Point is reached; but to the westward of this point it is not so clear, and, as a safe rule, it is well not to stand to the southward of Horton's Point Light-house bearing E. $\frac{1}{2}$ N. In fine weather, however, you may approach the shore within a mile until near Roanoke Point, where a long sand spit makes to the northward for over a mile and a half with from six to twelve feet water upon it. It is known as Roanoke Point Shoal and is marked by a black spar-buoy (No. 5) placed in eighteen feet water at its northern end,—Horton's Point Light-house bearing E. by N. Northerly. The rule above given for avoiding danger on this shore (Horton's Point Light-house bearing E. $\frac{1}{2}$ N.) carries you well clear of this shoal.

On the northern shore, when to the westward of Long Sand Shoal, it is best not to go to the northward of Falkner's Island Light-house bearing W. $\frac{1}{2}$ N. or Cornfield Point Light-vessel E. $\frac{1}{2}$ S., by which means all dangers between the two will be avoided. In day-time, however, with clear weather, vessels may stand so far to the northward as to bring Falkner's Island Light-house to bear W. $\frac{1}{2}$ S. In doing so they must be careful not to approach Duck Island nearer than three-eighths of a mile and Hammonasset Point nearer than three-quarters of a mile. Off Hammonasset Point there is a shoal extending in a S SE. direction for about eleven hundred yards with from six to ten feet water upon it. It is known as Hammonasset Point Reef, and is marked by a red spar-buoy (No. 2) placed in three fathoms on its southwestern side,—Falkner's Island Light-house bearing about W. by S.

When to the westward of Hammonasset Point, vessels beating through the Main Channel should not stand into the bight between that point and Sachem's Head, as the shore is rocky and foul. When nearing Falkner's Island they must look out for Kimberley's Reef, a very small detached shoal lying a mile and three-eighths E. $\frac{1}{2}$ N. from the light-house. It has ten feet water upon it and five and six fathoms on all sides of it, and is marked by a spar-buoy painted red and black in horizontal stripes and placed in fifteen feet on the northern side of the reef. To avoid it follow the rule given above,—not going to the northward of Falkner's Island Light-house bearing W. $\frac{1}{2}$ N. Goose Island open to the southward of Falkner's Island also clears this reef.

Dangerous ledges lie between Falkner's and Goose islands, rendering it unsafe for strangers to attempt to pass through; and in beating Goose Island must receive a berth to the northward of not less than half a mile to avoid the rocky shoals off its southern end.

When to the westward of Goose Island you may stand far enough to the northward to bring Falkner's Island light to bear E. $\frac{3}{4}$ S., but no farther, on account of the ledges lying to the southward of The Thimbles. Of these the southernmost is called East Ledge and has six feet at low water. It is a detached ledge with from four to seven fathoms on all sides of it, lies N NE. and S SW., and is about three hundred and fifty yards long. A red

spar-buoy (No. 12) is placed in three fathoms off the southern end of the ledge and bears from Falkner's Island Light-house **W. by N. $\frac{3}{4}$ N.**, a little over five miles and an eighth distant.

About two hundred yards to the northward of the northern end of East Ledge lies Brown's Reef, nearly a quarter of a mile long in an **E. and W.** direction and bare at low water near its western end; and about two hundred yards to the northward of this lies Wheaton's Reef, also bare at low water, and marked on its northern side by a black spar-buoy (No. 3) placed in fifteen feet to mark the southern side of the North Channel. These ledges will be fully described under the head of "Dangers" in the North Channel.

*Brown's and
Wheaton's
Reefs.*

One mile and three-quarters to the westward of East Ledge buoy will be seen a grey stone beacon of circular form, surmounted by an iron spindle and ball. This beacon, which is known as Branford Reef Beacon, is on Branford Reef, a detached shoal, six hundred yards long **N. by E. and S. by W.**, bare at low water, and surrounded by depths varying from four to eight fathoms. On its northern side, between it and The Negro Heads, passes the Inner North Channel. To avoid Branford Reef do not stand to the northward of Falkner's Island Light-house bearing **E. $\frac{3}{4}$ S.**

Branford Reef.

On the southern shore of the Sound, when to the westward of Friar's Head, a good rule for vessels in beating is not to approach the shore nearer than two miles and a quarter until past Herod's Point, or, at night, not to stand into less than seventeen fathoms water; after which they should not approach nearer than two miles. By this means all the shoals between Roanoke Point and Old Field Point will be avoided. Of these shoals the first met with after passing Roanoke Point is off Herod's Point and is called Herod's Point Shoal. It extends a mile and three-quarters from shore and has six feet at low water nearly a mile and a half **NNE.** from Herod's Point. At this position there is a black spar-buoy, marked No. 7, and placed in three fathoms; but this buoy should not be approached closely, as there is a depth of fourteen feet half a mile **NW. by W. $\frac{1}{4}$ W.** from it,—the buoy being placed on the northeastern end of the shoal.

*Herod's Point
Shoal.*

About five miles and a half to the westward of Herod's Point an area of shoal ground extends out from Rocky Point nearly a mile and a quarter, and has soundings upon it of ten feet at low water three-quarters of a mile from shore. This shoal ground extends from Rocky Point to abreast of Miller's Landing, a distance of two miles and a half, and the name Rocky Point Shoals is given to it. There are several bare rocks and a great number of sunken ones scattered over its surface, prominent among the former being *The Old Sow*, four hundred yards **NE. $\frac{1}{2}$ E.** from Rocky Point, and *Miller's Rock*, half a mile **NE. $\frac{1}{2}$ E.** from Miller's Landing. None of these are buoyed, as the rule given above for avoiding the southern shore is considered sufficient.

*Rocky Point
Shoals.*

Off Mount Misery Point, five miles and three-quarters to the westward of Rocky Point, lies Mount Misery Shoal, with six feet at low water. It is six hundred and fifty yards long in an **E NE. and W SW.** direction, and is marked at its eastern end by a black spar-buoy (No. 11) placed in fourteen feet three-quarters of a mile to the northward of Mount Misery Point, with Old Field Point Light-house bearing **W. $\frac{3}{4}$ N.** Nearly, and the Middle Ground Light-house **N. $\frac{1}{4}$ W.** There is a passage with thirteen feet between this shoal and Mount Misery Point.

*Mount Misery
Shoal.*

To avoid Mount Misery Shoal do not stand to the southward of Old Field Point Light-house bearing **W. by S. $\frac{1}{2}$ S.**; or, keep two miles from shore, as directed above.

On the northern shore of the Sound, when to the westward of Branford Reef, do not, unless bound into New Haven, stand farther to the northward than to bring Stratford Point Light-house to bear **W. $\frac{3}{8}$ S.**; or go about as soon as you strike five fathoms. By so doing you will avoid Townsend's Ledge,—the southernmost of the outlying shoals off the entrance to New Haven. It is a detached shoal spot about two hundred yards in diameter, with eighteen feet upon it at mean low water. On its southwestern side is placed a spar-buoy, painted red and black in horizontal stripes, bearing from the beacon on Branford Reef **W. $\frac{3}{8}$ S.**, distant two miles and three-quarters; from Southwest Ledge Light-house **SE. $\frac{1}{4}$ E.**, two miles and a half; and from Stratford Point Light-house **E. $\frac{3}{4}$ N.**, distant eleven miles and three-eighths. This ledge is not specially dangerous to vessels bound into New Haven Harbor, but vessels of heavy draught passing through the Sound should beware of it.

*Townsend's
Ledge.*

Between Branford Reef and Townsend's Ledge vessels should be careful how they stand in towards the north shore, and should be guided by the above bearing of Stratford Point Light-house—**W. $\frac{3}{8}$ S.** Several dangerous detached shoals lie off this part of the shore,—the first one met with to the westward of Branford Reef being Five Feet Rock, a small pinnacle rock with five feet, lying five-eighths of a mile to the south-westward of Jeffry's Point and exactly in the middle of the approach to Branford Harbor. A red spar-buoy (No. 18) is placed on its southern edge. A more detailed description of this dangerous rock will be found under the head of Branford Harbor.

*Five Feet
Rock.*

A little over half a mile to the westward of the red buoy No. 18 lies the dangerous shoal known as The Cow and Calf,—two bare rocks surrounded by shoal water, with a twelve feet spot a little to the westward of them. They lie about five-eighths of a mile SW. by S. $\frac{1}{2}$ S. from Branford Point and a mile and seven-eighths NW. Westerly from Branford Reef Beacon. They are not buoyed.

To the westward of The Cow and Calf the shore is foul as far as the entrance to New Haven,—shoals extending out to distances from shore varying from a half to seven-eighths of a mile. The most dangerous of these is Round Rock, which is always out, and lies nearly in line between Townsend's Ledge and Morgan's Point,—being distant from the former one mile and five-eighths and from the latter a little over five-eighths of a mile. It is surrounded upon all sides by detached pinnacle rocks,—some bare at low water and others having from one to four feet upon them; and to the southward from it makes off shoal water to a distance of over a quarter of a mile. On the southern edge of this shoal ground, in fifteen feet water, is placed a red spar-buoy (No. 20), marking the eastern side of the entrance to New Haven Harbor.

In standing in towards New Haven Harbor a nun-buoy of the first class, painted red and black in horizontal stripes, will be seen about five-eighths of a mile to the southwestward of Southwest Ledge Light-house. This is on Luddington Rock, a dangerous sunken rock, with fifteen feet at low water, which lies near the southeastern end of the great mass of shoals making off from the western side of New Haven Harbor. The buoy is in sixteen feet on the eastern side of the rock,—Southwest Ledge Light-house bearing ENE. and Stratford Point Light-house W. by S. $\frac{3}{4}$ S.

Between New Haven Entrance and Stratford Point the shore is much cleaner, but strangers are not recommended to go to the northward of Stratford Point Light-house bearing W. $\frac{1}{2}$ S., as before mentioned. There is a buoy off Pond Point, on what is known as Pond Point Shoal, two miles and three-quarters to the southwestward of Oyster River Point. This shoal extends nearly due S. from Pond Point for six hundred and fifty yards and has two feet upon it five hundred yards from shore. The buoy is a red spar, marked No. 14, and placed in three fathoms on the extreme southern point of the shoal. A little over three-quarters of a mile to the westward of it will be seen another red spar-buoy, which marks the southern extremity of Welch's or Cedar Point Reef, making off in a southeasterly direction from Welch's Point for three-eighths of a mile. The buoy is marked No. 16 and placed in eighteen feet on the southern edge of the shoal,—Pond Point Shoal buoy bearing E. and the house on Charles' Island W. by S. Nearly.

Charles' Island should not be approached from the southward nearer than half a mile, as shoal water extends from it in that direction for six hundred yards, with soundings at that distance of ten feet; nor should the bight between this island and Stratford Point be entered at all except by vessels bound to Stratford.

On nearing Stratford Point, in passing through the Main Channel, it should receive a berth of a mile and a half in order to clear the dangerous shoals making off from it to the southward,—the southernmost of which has nine feet at low water and is nearly a mile from shore. The general name Stratford Point Shoal is given to the whole area of this shoal ground; and the southern end of the nine feet shoal is marked by a red spar-buoy (No. 16) placed in fifteen feet at mean low water,—Stratford Point Light-house bearing NE. $\frac{1}{2}$ E., a mile and five-eighths; Penfield's Reef Light-house W. $\frac{1}{2}$ S., four miles and three-eighths; and Bridgeport Harbor Light-house NW. $\frac{3}{4}$ W., two miles and seven-eighths distant. To avoid this shoal at night do not stand to the northward of Penfield's Reef Light-house bearing W. $\frac{1}{2}$ N.

The Middle Ground, or *Stratford Shoal* as it is sometimes (though incorrectly) called, lies almost exactly midway between the northern and southern shores of the Sound,—being nearly five miles to the northward of Old Field Point and five miles and three-eighths to the southward of Stratford Point. It extends N. $\frac{1}{2}$ E. and S. $\frac{1}{2}$ W. for about eight hundred and fifty yards with an average width of three hundred yards, and soundings over it varying from two to fifteen feet at low water. On its shoalest part near its northern end is built Middle Ground Light-house, before described, (see page 355.) It shows a white light, flashing once every ten seconds; and a Daboll trumpet gives blasts six seconds long at intervals of twenty-one seconds during thick or foggy weather. This light-house bears from

	Miles.
Falkner's Island Light-house, W. by S. $\frac{3}{4}$ S. -----	a little over 22
Cornfield Point Light-vessel, W. $\frac{1}{2}$ S. Nearly -----	33 $\frac{1}{2}$
Horton's Point Light-house, W. $\frac{1}{2}$ N. -----	29 $\frac{1}{2}$
Old Field Point Light-house, N. by E. $\frac{1}{2}$ E. -----	5

On the northern shore, about four miles and three-eighths to the westward of the red buoy on Stratford Point Shoal, we come to Fairfield Bar and Penfield's Reef, on the western side of the entrance to Black Rock and Bridgeport harbors. Fairfield Bar is a very narrow sand spit a little over a mile long and dry at low water, extending about SE.

by **E. $\frac{1}{4}$ E.** from Shoal Point,—the eastern extremity of Fairfield Beach. About two hundred and fifty yards to the northeastward of its southeastern end lies a group of rocks, some bare and some awash at low water, called *The Cows*; and on its southern side is what is known as Penfield's Reef, with from one to two feet upon it at mean low water.

Two hundred and fifty yards to the eastward of the eastern extremity of Fairfield Bar is placed a spindle composed of iron screw-piles surmounted by a cage and called **Black Rock Beacon**. It serves as one of the guides for the entrance to Black Rock Harbor. The beacon is painted red, and bears from

	Miles.
Bridgeport Harbor Light-house, SW. $\frac{1}{8}$ W. -----	about 2 $\frac{5}{8}$
Red buoy on Stratford Point Shoal, W. -----	4 $\frac{1}{8}$
Middle Ground Light-house, NW. $\frac{1}{8}$ W. -----	6 $\frac{1}{4}$
Old Field Point Light-house, N. by W. $\frac{3}{4}$ W. -----	9 $\frac{1}{2}$

From this beacon Penfield's Reef Light-house bears **SW. $\frac{1}{2}$ W.**, about six hundred yards distant.

Penfield's Reef Light-house, which is about four hundred yards to the southward of the eastern extremity of Fairfield Bar, has been already described on pages 360-361. It shows a red light, flashing at intervals of five seconds, and visible thirteen miles. During thick weather a bell is struck by machinery, two blows in quick succession, at intervals of twenty seconds.

To avoid Penfield's Reef and the shoals in its vicinity vessels must not stand to the northward of Norwalk Light-house bearing **W. by S.** This bearing also clears Cockenoe's Island Shoal, sometimes (though erroneously) called *Norwalk Island Eastern Shoal*, which makes off from Cockenoe's Island in an **E. by S.** direction for more than a mile and a quarter. Besides these the above bearing will enable a vessel to avoid *Pine Creek Point Shoal*, which makes off from the point of that name for about half a mile and is nearly all bare at low water. Its southern end is marked by a red spar-buoy,—bearing from Penfield's Reef Light-house **W. $\frac{3}{8}$ S.**, distant nearly one mile and seven-eighths.

The shoals which surround the Norwalk Islands are very dangerous and extensive, and strangers cannot be too careful in avoiding them. The eastern portion of this great area of shoal ground is formed by Cockenoe's Island Shoal, (as above mentioned,) which is bare in some places, awash in others, and has scattered over its surface many rocks which are always out. A mile and an eighth **E. by S. $\frac{1}{2}$ S.** from the eastern extremity of the island is a rock awash, called *George's Rock*. A mile and a quarter **SE. by E. $\frac{1}{4}$ E.** from the same point of the island there is nine feet at low water; and three-quarters of a mile **SE. $\frac{3}{4}$ S.** from the middle of the island there is ten feet. The only portion of the shoal which is buoyed is the nine feet spot at its southeastern extremity, where there is placed a red can-buoy of the second class, marked No. 20. It bears from

*Cockenoe's
Island Shoal.*

	Miles.
Penfield's Reef Light-house, W. by S. $\frac{1}{2}$ S. -----	5 $\frac{3}{8}$
Middle Ground Light-house, W. by N. $\frac{3}{8}$ N. -----	10 $\frac{1}{4}$
Old Field Point Light-house, NW. $\frac{1}{2}$ W. -----	11 $\frac{3}{8}$

From this buoy Norwalk Light-house bears **W. by S. $\frac{3}{8}$ S.**, four miles and a half distant.

When in the vicinity of the Norwalk Islands, in order to clear them and their adjacent shoals, vessels should be careful not to stand into less than five fathoms at low water, or not to stand to the northward of Penfield's Reef Light-house bearing **E NE.**

From the western extremity of Sheffield Island (the westernmost of the Norwalk group) there extends in a **W. by S. $\frac{1}{2}$ S.** direction for a mile and a half a long and narrow ledge called *Green's Ledge*, which marks the southern side of the western entrance to Sheffield Island Harbor.

Near Sheffield Island it is bare at low water; and rocks awash, and sunken rocks with *Green's Ledge*. From two to eight feet upon them, are scattered along its length. A red can-buoy* of the second class (No. 22) is placed in sixteen feet water just to the westward of an eight feet rock a little over a mile and an eighth **W. by S. $\frac{1}{2}$ S.** from Norwalk Light-house; but vessels of greater draught than sixteen feet must, if intending to enter Sheffield Island Harbor, give it a berth to the eastward of a quarter of a mile.

Nearly due **S.** from the western end of Sheffield Island, about four hundred yards distant, is a wooden spindle surmounted by a cage. This is on *Great Reef*, which extends to the southward from the main portion of *Green's Ledge*; and it bears from Norwalk Light-house **SW. by S. $\frac{1}{4}$ S.**, distant seven hundred yards. From this spindle *Green's Ledge* buoy bears **W. $\frac{1}{2}$ S.**, a mile and an eighth, and the buoy on *The Cows* **W. by S. $\frac{1}{2}$ S.**, five miles distant.

On the southern side of the Sound, nearly opposite to Norwalk Light-house, makes out Eaton's Point Shoal, which must be carefully avoided by vessels passing through either the Main or South channels. Eaton's Point Shoal makes off from Eaton's Point in a nearly **N.** direction for about seven-eighths of a mile, and soundings of from two to six feet are found upon it in a **NE.** direction from the light-house for half a mile. On the northern extremity of the shoal the buoy is placed,—a black spar (No. 13), which is useful as a guide to vessels passing through the South Channel.

*Eaton's Point
Shoal.*

To avoid Eaton's Point Shoal vessels beating through the Sound should not stand to the southward of Captain's Island Light-house bearing **W. $\frac{1}{4}$ N.**

A little over four miles to the westward of Eaton's Point will be seen a black spar-buoy off Lloyd's Neck. This is on Lloyd's Point Shoal, which has fourteen feet at mean low

Lloyd's Point Shoal.

water and extends to the northward from Lloyd's Point for eight hundred yards. The buoy is marked No. 15, placed in eighteen feet water on the northern end of the shoal, and may be avoided when in its vicinity by not standing into less than nine fathoms,

or by going about as soon as Eaton's Neck Light-house bears **E. by S.**

On the northern side of the Sound, after passing Green's Ledge buoy, look out for Long Neck Point Shoal, which lies a mile and a half to the westward and is not marked in any way.

Long Neck Point Shoal.

It makes off to the southward from Long Neck Point for seven hundred yards and is best avoided by not standing to the northward of Norwalk Light-house bearing **E NE.**

The same rule is applicable to Smith's Rock, three-quarters of a mile to the westward of Long Neck Shoal and two miles and three-eighths to the westward of the buoy on Green's Ledge.

Smith's Rock is really a ledge, half a mile long **N. and S.** and for the most part bare at low water. It is marked by a red spar-buoy (No. 24) placed upon its southern extremity

Smith's Rock.

in two fathoms water,—Norwalk Light-house bearing **E. by N. $\frac{1}{2}$ N.**, three miles and five eighths, and Captain's Island Light-house **W. by S. $\frac{3}{4}$ S.**, six miles and a half distant.

When to the westward of this rock do not go to the northward of Norwalk Light-house bearing **E NE.** until past The Cows,—a group of bare rocks off Shippan Point, and a mile and three-quarters to the southwestward of Smith's Rock.

The Cows are a group of detached rocks, bare at low water, which lie three-quarters of a mile due **S.** from Shippan Point and directly opposite to the entrance to Oyster Bay, on the southern side of the Sound. A red can-buoy* of the second class (No. 26) is placed

The Cows.

on their southern side in two fathoms at low water, and from it Norwalk Light-house

bears **E. by N. $\frac{3}{4}$ N.**, five miles and a quarter, and Captain's Island Light-house **W. $\frac{3}{4}$ S.**, four miles and three-quarters distant. To avoid it in beating do not stand to the northward of Norwalk Light-house bearing **E NE.**, or Captain's Island Light-house **W. $\frac{1}{2}$ S.**

Vessels beating through the Sound must also avoid Greenwich Point, which (as before described on page 370) lies two miles and a quarter to the westward of Shippan Point and about two miles and five-eighths to the eastward of Captain's Island Light-house. Here there is a long shoal with sunken rocks and rocks awash making off to the southeastward for six hundred yards, and another with from six to twelve feet making off to the southward for about half a mile. Neither is buoyed, and to avoid them vessels must not go to the northward of Captain's Island Light-house bearing **W. $\frac{1}{2}$ S.**

On the southern side of the Sound and the western side of the entrance to Oyster Bay a long shoal, known as Centre Island Reef, makes off for one mile to the northward from

Centre Island Reef.

Centre Island Point. A black spar-buoy (No. 17) is placed on its northwestern side, about three-quarters of a mile from the point; but this is of no use to large vessels, as

seventeen feet is found three-eighths of a mile to the northeastward of it. The reef is dotted with bare rocks and rocks awash at low water, and in its deeper parts has from three to seven feet upon it. The buoy on its northwestern side bears **SW. by W. $\frac{1}{2}$ W.**, two miles and a half from the black

buoy on Lloyd's Point Shoal, and **E. $\frac{3}{4}$ N.**, nine miles and three-quarters from the light-house on Execution Rocks. The proper position for the buoy on this reef would be in three and a quarter fathoms, with Lloyd's Point Shoal buoy bearing **E NE.** and the light-house on Execution Rocks **W. by S.**

Oak Neck Point, a little over two miles to the westward of Centre Island Point, should not be approached nearer than half a mile to avoid the shoals making off from it; or, as a general rule for all the southern shore from Centre Island Point to Sands' Point, vessels should not stand to the southward of the light-house on Execution Rocks bearing **W. by S. $\frac{1}{4}$ S.**

The same rule applies to Matinicock Point, off which shoal water extends in a northerly direction for about a quarter of a mile, and is marked by a black spar-buoy (No. 19) placed in three fathoms on its northern end. To avoid this shoal vessels may go about when standing to the southward, when Sands' Point Light-house bears **W SW.** or Execution Rocks Light-house **W. by S. $\frac{1}{4}$ S.**

On the northern side of the Sound, when to the westward of Captain's Island Light-house, you must be careful not to go to the northward of that light-house bearing **NE. $\frac{3}{4}$ E.**, by which means all of the shoals on the northern shore between Great Captain's Island and Whortleberry Island will be avoided. There is a dangerous ledge with four feet at mean low water, about a quarter of a mile **W. $\frac{1}{2}$ S.** from the western end of Great Captain's Island, on which there is a red spar-buoy (marked No. 2) as a guide to the entrance to Captain's Island Harbor from the westward. It is easily avoided by not going to the northward of the bearing of Captain's Island Light-house given above.

One mile to the westward of the western end of Great Captain's Island will be seen a black spar-buoy, (not numbered,) which marks the southeastern extremity of Blue-fish Reef Shoal,

Blue-fish Reef Shoal.

on the western side of the western entrance to Captain's Island Harbor. This shoal lies off Manursing Island at a distance of five-eighths of a mile and has fifteen feet

at low water. It is avoided by following the rule given above with regard to Captain's Island Light-house.

Transport Rock, seven hundred yards to the southward of Manursing Island, and *Forbes' Rock*, three-quarters of a mile to the southward of the same island, are also avoided by keeping to the southward of Captain's Island Light-house bearing **NE. $\frac{3}{4}$ E.** Both rocks are awash at low water and neither is buoyed.

Shoal water and sunken rocks lie to the southwestward of Rye Neck, extending to a distance of five-eighths of a mile in a **SW.** by **S.** direction; but vessels easily avoid all of these dangers, as before mentioned, by watching the bearing of Captain's Island Light-house.

Execution Rocks (before described on page 368) are surrounded by shoal water. To the north-eastward the shoals extend in a **NE.** by **N.** direction for half a mile with depths varying from nine to twelve feet. On the northern extremity of this reef is placed a spar-buoy painted red and black in horizontal stripes, which bears from Sands' Point Light-house **N. $\frac{1}{2}$ W.**, a mile and a quarter, and from Captain's Island Light-house **SW. $\frac{1}{2}$ W.**, seven miles and five-eighths distant. From this buoy Throg's Neck Light-house bears **SW. $\frac{3}{4}$ S.**, five miles and a quarter distant. It is usual for vessels using the Main Channel to pass to the southward of Execution Rocks, between them and Sands' Point; but with the wind scant, or a strong ebb-tide, it is sometimes convenient to pass to the northward and westward of them.

**Execution
Rocks.**

From the southern side of Execution Rocks *shoal ground extends to the southwestward* for six hundred and fifty yards, with from two to eight feet water, and is marked by a spar-buoy painted red and black in horizontal stripes, placed in eighteen feet,—the light-house on the rocks bearing **NE. $\frac{1}{4}$ E.**, seven hundred yards; Sands' Point Light-house **SE. $\frac{1}{2}$ S.**, a little over three-quarters of a mile; and Throg's Neck Light-house **SW. $\frac{3}{4}$ S.**, four miles and five-eighths distant. Vessels usually pass between this buoy and Sands' Point.

On the northern side of the Sound *shoal water makes off from Delancey's Point* in a southeasterly direction for about three-eighths of a mile. Eight feet at mean low water is found on this shoal a quarter of a mile from shore, but vessels passing through the Sound pay no attention to it unless beating to windward, when they should go about as soon as Captain's Island Light-house bears **NE. $\frac{3}{4}$ E.** A black spar-buoy (No. 1) is placed on the southeastern end of the shoals off Delancey's Point.

About a mile and a quarter to the southwestward of Delancey's Point and off the mouth of Delancey's Cove lies a dangerous reef, bare in places at low water, and known as Long Beach Point Reef. It is about five-eighths of a mile long **N.** by **E.** and **S.** by **W.** and a quarter of a mile wide, and over this area are scattered numerous rocks awash and sunken rocks with from two to nine feet upon them. This shoal is not buoyed, but there should be a red buoy on its southern end as a guide to vessels bound into New Rochelle Harbor from the eastward. To avoid it vessels should not go to the northward of Captain's Island Light-house bearing **NE. $\frac{3}{4}$ E.**

**Long Beach
Point Reef.**

Vessels passing between Execution Rocks and Sands' Point should not approach Prospect Point nearer than half a mile to avoid Prospect Point Shoal, which makes off from that point in a northwesterly direction for nine hundred yards. Ten feet at low water is found on this shoal six hundred and fifty yards from shore, and a rock awash, called *The Old Hen*, lies about three hundred and fifty yards **N. $\frac{3}{4}$ E.** from Prospect Point. This shoal is not buoyed.

**Prospect Point
Shoal.**

Sands' Point should not be approached nearer than three-eighths of a mile to avoid Sands' Point Reef, which makes off in a northwesterly direction from the point for over six hundred yards and has from two to nine feet upon it at low water. It is marked by a black spar-buoy (No. 21) placed in three fathoms and a half on its northwestern side,—Sands' Point Light-house bearing **SE. $\frac{1}{2}$ S.**, nearly seven hundred yards, and Execution Rocks Light-house **N. $\frac{3}{4}$ W.**, a little over half a mile distant. To avoid this shoal vessels should not stand to the southeastward farther than to bring Throg's Neck Light-house to bear **SW. $\frac{1}{4}$ S.**

**Sands' Point
Reef.**

Vessels which pass on the western side of Execution Rocks must be careful not to approach Pea Island nearer than a quarter of a mile, as there is a *dangerous reef with from five to seven feet at low water upon it, and several bare rocks near its eastern end*, which extends from the island to the southeastward four hundred yards. It is not buoyed, but is easily avoided by not standing to the westward of the range of the southern end of Hart Island with Throg's Neck Light-house on a bearing of **SW.** by **S. $\frac{1}{4}$ S.**

This range also clears the long reef extending to the southward from the nameless island mentioned on page 373 as lying nine hundred yards **W SW.** from Pea Island. This reef, which is called Middle Reef, is bare in places at low water and extends from the island to the southward for seven hundred yards. It is a serious obstruction to vessels bound to New Rochelle from the westward, but is not in the way of those passing through the Sound.

Middle Reef.

Off Barker's Point, on the southern side of the channel, there extends a *long and very dangerous reef* for five-eighths of a mile in a **NW.** by **N.** direction. On the northwestern extremity of this reef is placed a black spar-buoy (No. 23) which marks the position of Gangway Rock, which has six feet at low water. About four hundred and fifty yards to the southeastward of this buoy and three-eighths of a mile from Barker's Point will be seen a red spindle,

**Gangway and
Success Rocks.**

consisting of an iron shaft surmounted by a conical cage. This is on Success Rock, another outcropping rock of the reef, awash at low water. Throg's Neck Light-house bearing SW. $\frac{3}{4}$ S., or Execution Rocks Light-house NE. $\frac{1}{8}$ N., will lead clear of this reef.

The eastern shore of Hart Island should receive a berth to the westward of not less than four hundred yards to avoid the shoal water on that side; while Hewlett's Point, on the southern side of the channel, should not be approached nearer than six hundred yards to avoid the dangerous reef making to the northward from it for three hundred and fifty yards. This reef has nine feet at low water upon it three hundred yards from the point, and there are also several bare rocks and rocks awash at low water.

When past the southern end of Hart Island there will be seen about a mile off, and bearing W. by S. $\frac{1}{2}$ S., a red spar-buoy. This is on City Island Shoal, on the western side of the channel, and about three-eighths of a mile to the southwestward of the southern end of City Island.

City Island Shoal. This shoal is formed by a bare rock known as Big Tom, surrounding which are sunken rocks with from four to nine feet water upon them. The buoy (No. 30) is placed in fifteen feet at low water, with Sands' Point Light-house bearing NE. by E. $\frac{1}{2}$ E., a little over three miles and a quarter, and Throg's Neck Light-house S. by W., one mile and a half distant. To avoid this shoal vessels should not stand to the westward of Throg's Neck Light-house bearing SW. by S. $\frac{1}{2}$ S.

On the southern side of the channel, a mile and a quarter to the westward of Hewlett's Point, will be seen the light-house called Stepping Stones Light-house,—consisting of a one-story dwelling of red stone, standing on a granite pier and surmounted by a lantern. This is on The Stepping Stones,—a very dangerous group of rocks forming the northwestern extremity of a long reef making off from Elm Point. The light-house shows a fixed red light, visible ten miles, and has been already described on page 369. The reef has several rocks awash upon it, and sunken rocks with from two to seven feet at low water, and extends from Elm Point in a NW. $\frac{1}{2}$ N. direction for over three-quarters of a mile. The channel between

The Stepping Stones.

the light-house and the great shoals off Pelham Bay, and between City Island and Throg's Neck, is half a mile wide. When past this light-house vessels beating to windward must not stand to the westward of Throg's Neck Light-house bearing SW. by S. $\frac{1}{2}$ S., or the southern end of Hart Island bearing NE. by N. $\frac{1}{4}$ N. This will avoid the shoals between City Island and Throg's Neck.

When past Stepping Stones Light-house you must keep on the western side of the passage to avoid the shoal water off Little Neck Bay. You may approach Throg's Neck within a quarter of a mile, but must not come nearer on account of the shoal, called Throg's Neck Shoal, which makes off from that point to the southeastward for about two hundred yards. The southeastern extremity of this shoal is marked by a red spar-buoy

(No. 32) placed in three fathoms,—Stepping Stones Light-house bearing NE. $\frac{1}{4}$ N. and Throg's Neck Light-house N. $\frac{3}{4}$ W.

Beyond Throg's Neck vessels bound to New York should take a pilot.

SAILING DIRECTIONS

FOR APPROACHING, ENTERING AND PASSING THROUGH LONG ISLAND SOUND.

I. By the Main Channel.—1. Having come from Vineyard Sound or Bussard's Bay.—With Vineyard Sound Light-vessel bearing NW. $\frac{3}{4}$ W., nearly two miles distant, and a depth of eleven and a half fathoms, steer W. Southerly, carrying not less than eight fathoms, until Block Island North Light-house bears S. $\frac{1}{4}$ W., a little over three miles distant. At this position the depth will be twenty fathoms and W. Northerly will lead, with not less than eleven fathoms, through Block Island Sound and up to The Race. When in The Race, with Race Rock Light-house bearing NE. by E. $\frac{1}{2}$ E. and Little Gull Island Light-house SW. by W. $\frac{1}{4}$ W., the depth will be thirty-three fathoms and the course through the Main Channel of Long Island Sound W., which will lead, with not less than six and a half fathoms, past Falkner's Island, New Haven, Stratford Point, and The Middle Ground, until Penfield's Reef Light-house bears NE. by N. $\frac{3}{4}$ N. and Eaton's Neck Light-house SW. $\frac{1}{2}$ W. Here the depth will be ten fathoms and the course W. by S. $\frac{1}{4}$ S., which will lead, with not less than six and a half fathoms, to abreast of Sands' Point Light-house. When this light-house bears SSE. Easterly, half a mile distant, and the light-house on Execution Rocks N. $\frac{1}{4}$ W., seven hundred yards distant, steer SW. for three miles until abreast of the southern end of City Island, with Stepping Stones Light-house bearing S. $\frac{1}{4}$ W., about nine hundred yards distant. Here the depth will be eleven and a half fathoms and you may steer SW. by S. $\frac{1}{4}$ S., carrying not less than seven fathoms, until you come abreast of the red buoy (No. 32) off the southeastern extremity of Throg's Neck Shoal, when you may round it at a distance of three hundred yards and steer W. by N. $\frac{1}{4}$ N. into the East River.

LONG ISLAND SOUND FROM FALKNER'S ISLAND TO STRATFORD POINT

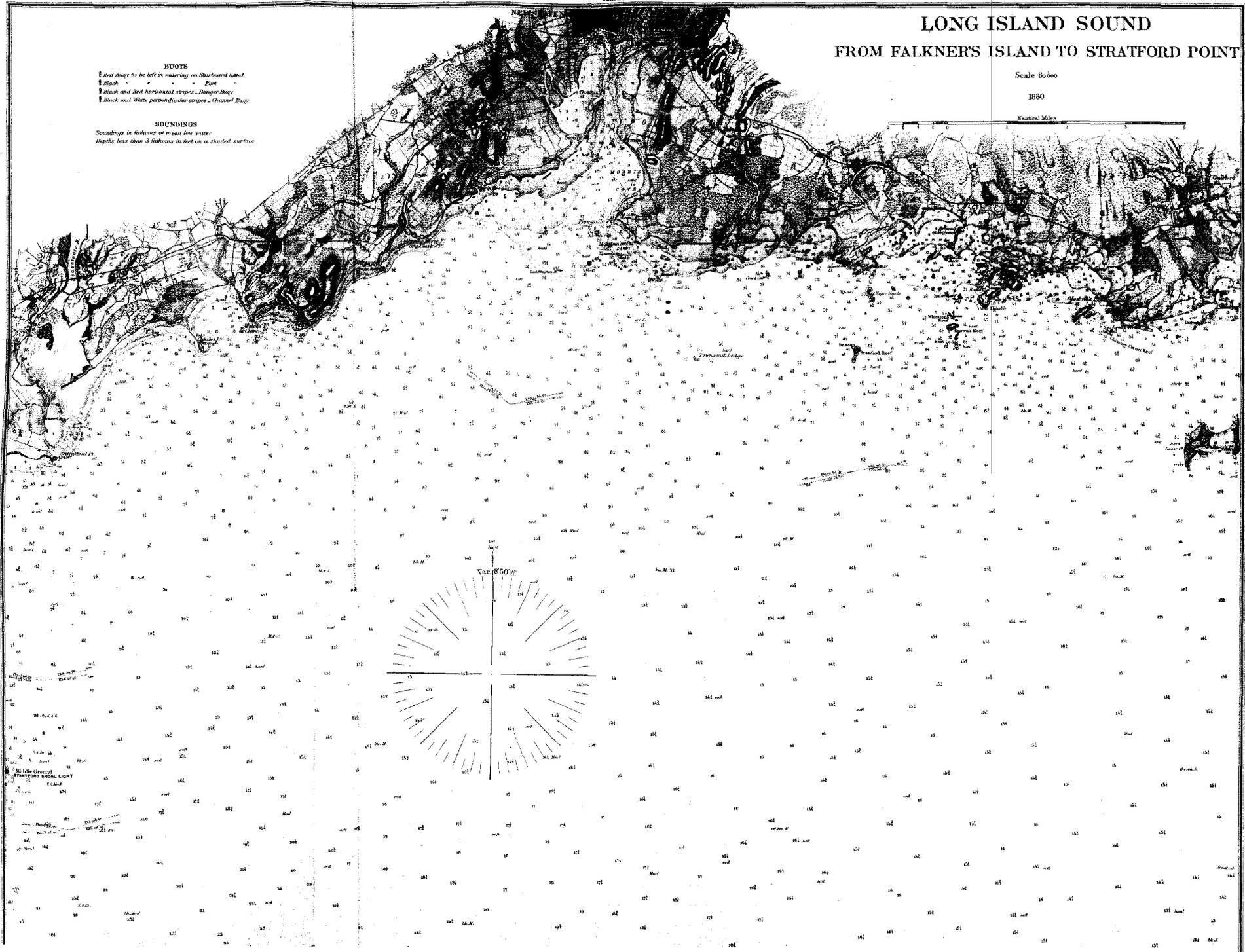
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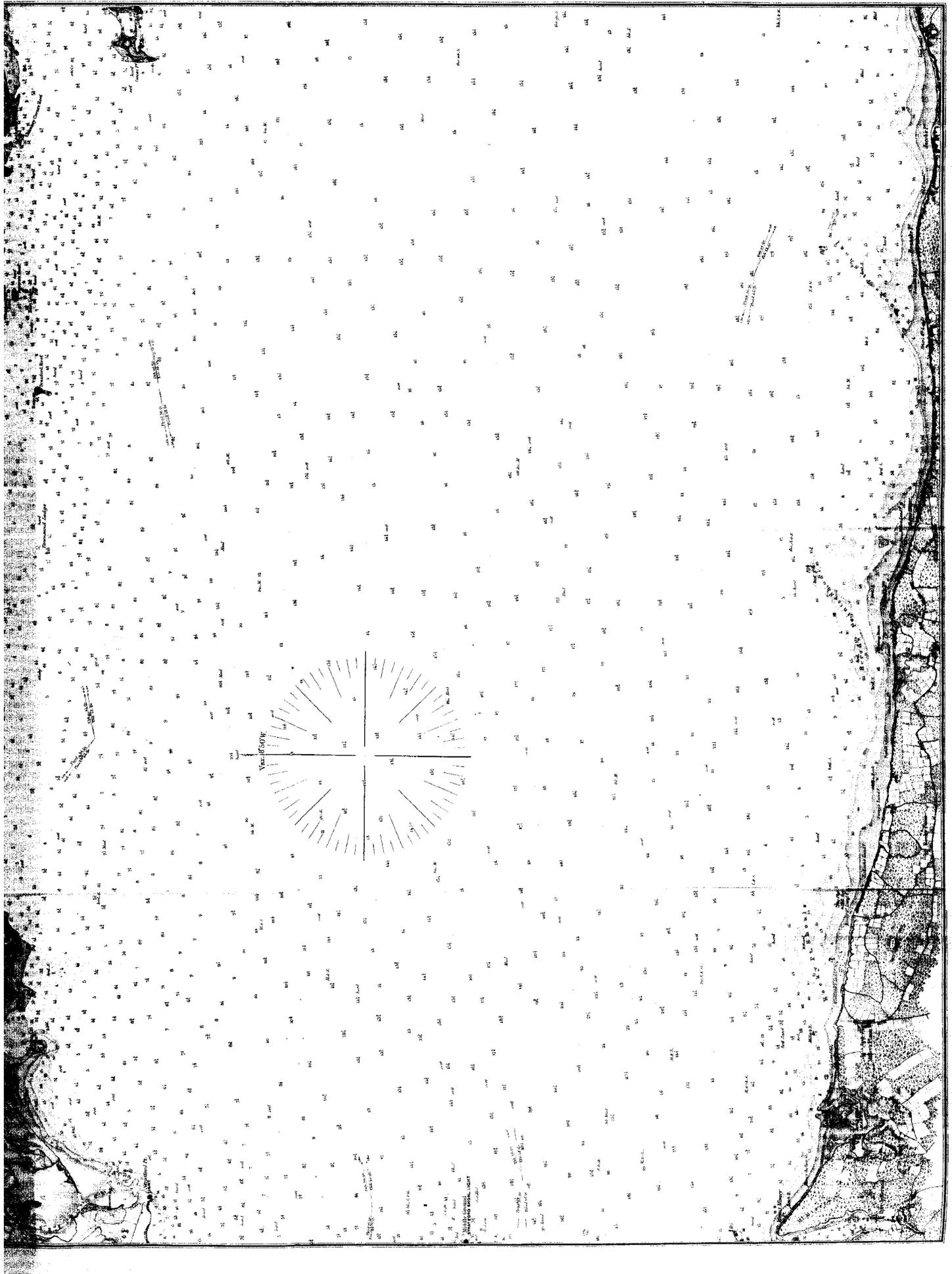
1880

Nautical Miles

BUOYS
 ▬ Red Buoy to be left in entering on Starboard Tack
 ▬ Black Buoy to be left in entering on Port Tack
 ▬ Black and Red horizontal stripes - Danger Buoy
 ▬ Black and White perpendicular stripes - Channel Buoy

SOUNDINGS
 Soundings in Fathoms at mean low water
 Depths less than 3 fathoms in feet on a shaded surface





The above courses pass a mile and five-eighths to the northward of the black *Sailing Direction*—*Long Island Sound* nun-buoy off Block Island North Reef; three miles and a half to the northward of the striped can-buoy on Cerberus Shoal; three miles to the southward of Watch Hill Reef; a mile and a quarter to the southward of Race Rock Light-house; six hundred and fifty yards to the southward of Valiant Rock; half a mile to the northward of Little Gull Island Reef; two miles and five-eighths to the southward of Long Sand Shoal; two miles and a quarter to the northward of Orient Shoal; three miles and five-eighths to the southward of Falkner's Island Light-house; a little over two miles to the northward of Middle Ground Light-house; two miles and a quarter to the southward of the red buoy on Stratford Point Shoal; two miles and an eighth to the southward of Penfield's Reef Light-house; one mile and seven-eighths to the southward of Cockenoe's Island Shoal; two miles and three-eighths to the northward of Eaton's Point Shoal; a mile and a half to the southward of *Budd's Reef*, (which has four fathoms and lies one mile and a quarter **SW.** $\frac{1}{2}$ **S.** from Norwalk Light-house;) a mile and a quarter to the northward of Lloyd's Point Shoal; two miles and a quarter to the southward of The Cows; a mile and a half to the northward of the black buoy on Centre Island Reef; five-eighths of a mile to the northward of the black buoy off Matinicoek Point; three hundred yards to the northward of the shoal off Prospect Point; five-eighths of a mile to the southward of the striped spar-buoy off the northern end of Execution Rocks; seven hundred yards to the southward of Execution Rocks Light-house; six hundred yards to the southward of the striped buoy on the southwestern end of Execution Rocks; a quarter of a mile to the northward of the black buoy off Sands' Point; three hundred yards to the northward of the black buoy off Gangway Rock; nearly half a mile to the northward of the shoal off Hewlett's Point; four hundred yards to the southward of the southern end of Hart Island; about five-eighths of a mile to the southward of the red buoy off City Island Shoal; an eighth of a mile to the westward of Stepping Stones Light-house; a quarter of a mile to the eastward of Throg's Neck Light-house; and nearly four hundred yards to the southward of the red spar-buoy off Throg's Neck.

On the above courses, to enter Fisher's Island Sound by the Watch Hill Passage.—With Block Island North Light-house bearing **S.** $\frac{1}{4}$ **W.**, a little over three miles distant, as before, steer **W.** by **N.** $\frac{3}{4}$ **N.**, which course will lead, with not less than six fathoms, to the entrance and up with the red buoy on Gangway Rock. Here you will have four and three-quarter fathoms and **W.** $\frac{3}{4}$ **N.** will lead through the Sound, following the directions given on page 321.

On the above courses, to enter Fisher's Island Sound by the Sugar Reef Passage.—On the course **W.** Northerly through Block Island Sound, when Watch Hill Light-house bears **N.** by **W.** $\frac{3}{4}$ **W.**, three miles and three-quarters distant, and the summit of Chocomount (on Fisher's Island) **NW.** by **W.** $\frac{1}{2}$ **W.**, the depth will be eighteen fathoms, and **NW.** by **N.** $\frac{1}{4}$ **N.** will lead, with not less than five fathoms, through Sugar Reef Passage and into the Main Channel of Fisher's Island Sound. On this course, when Dumpling Rock Light-house bears **W.** $\frac{1}{4}$ **N.** steer **W.** $\frac{3}{4}$ **N.**, following the directions given for Fisher's Island Sound.

On the above courses, to enter Fisher's Island Sound by Lord's Passage.—On the course **W.** Northerly through Block Island Sound, when Watch Hill Light-house bears **NE.** by **N.**, four miles and a quarter, and Stouington Light-house **N.** $\frac{1}{2}$ **E.**, five miles and a quarter distant, steer for the latter, which will lead, with not less than three and a half fathoms, safely through the passage until North Hammock Light-house bears **W.** $\frac{1}{2}$ **N.**, when follow the directions given for the Sound.

On the above courses, to enter Fisher's Island Sound at night.—Keep Watch Hill Light-house on a bearing of **N.** by **W.** and steer boldly in towards the beach until the red light on North Hammock opens from behind Fisher's Island on a bearing of **W.** $\frac{1}{4}$ **N.** Now steer **W.** $\frac{3}{4}$ **N.**, following the directions for Fisher's Island Sound.

On the above courses, to enter Napeague Bay.—With Watch Hill Light-house bearing **N.** by **W.** $\frac{3}{4}$ **W.**, three miles and three-quarters distant, and the summit of Chocomount (on Fisher's Island) **NW.** by **W.** $\frac{1}{2}$ **W.**, six miles and three-quarters distant, steer **SW.** $\frac{1}{4}$ **W.**, which will lead, with not less than five fathoms, into the bay, where anchorage may be found on either shore in from two to eight fathoms, according as the wind is from the eastward or westward.

Sailing Direc- *It is not safe for strangers to attempt to pass through the passage S. of Ram tions---Long Island, as it is full of shoals and few are buoyed; nor is it safe to attempt to enter Island Sound. Napeague Harbor, as the channel is narrow and crooked.*

The above SW. $\frac{1}{4}$ W. course passes two miles to the southeastward of the buoy on Cerberus Shoal and a mile and three-quarters to the northwestward of the black buoy on Shagwong Reef.

Wishing to enter Fort Pond Bay.—Continue the SW. $\frac{1}{4}$ W. course towards Napeague Bay until you are within a little over two miles of Culloden Point and Montauk Point Light-house bears SE. by E. $\frac{1}{4}$ E., a little over five miles and a half distant; when S. $\frac{1}{2}$ W. will lead, with not less than six fathoms, into Fort Pond Bay, where comfortable anchorage may be found in from three to eight fathoms, sheltered from all winds from ENE. around by S. to WSW.

On the above courses, to enter New London Harbor.—When in The Race, in thirty-three fathoms, with Little Gull Island Light-house bearing SW. by W. $\frac{1}{4}$ W., about one mile distant, and New London Light-house N. $\frac{3}{4}$ E., five miles and three-quarters distant, steer N. by E. $\frac{1}{8}$ E., which will lead, with not less than four and a half fathoms, to the entrance to the harbor; after which the directions for the harbor should be followed.

On the above courses, to enter Gardiner's Bay.—On the course W. Northerly through Block Island Sound, when Watch Hill Light-house bears N. by E. $\frac{3}{4}$ E., three miles and three-quarters, Race Rock Light-house W. $\frac{3}{4}$ N., seven miles and seven-eighths, and Little Gull Island Light-house W. $\frac{1}{4}$ S., ten miles and three-quarters distant, you will have nineteen fathoms and must steer W. by S. $\frac{1}{4}$ S. for fourteen miles, until Gardiner's Island Light-house bears SE. $\frac{3}{4}$ E., about a mile, and Plum Island Light-house NW. $\frac{1}{4}$ W., nearly three miles distant. Here the depth will be seven fathoms, and you must steer SW. $\frac{1}{8}$ W. into the bay, carrying not less than five fathoms, until Long Beach Point Light-house bears WNW. and Gardiner's Island Light-house NE. by E. $\frac{1}{4}$ E.; when you will have five and a half fathoms, and *if bound to Greenport* must steer W. by N. $\frac{1}{4}$ N.; *or, if bound to Sag Harbor, SW* by S. $\frac{3}{4}$ S., following in each case the directions given for entering those harbors under their respective heads.

On the above courses, to enter Niantic Bay.—When in The Race, with Little Gull Island Light-house bearing SW. by W. $\frac{1}{4}$ W., New London Light-house N. $\frac{3}{4}$ E., and Bartlett's Reef Light-vessel NNW., steer NW. by N. $\frac{1}{4}$ N., which will lead safely into Niantic Bay with not less than three and a half fathoms. Anchorage may be found in the bay in from fifteen to eighteen feet, well sheltered from northerly, easterly and westerly winds.

The above course for Niantic Bay passes half a mile to the westward of Bartlett's Reef; five-eighths of a mile to the westward of Two Tree Island; and four hundred yards to the westward of White Rock.

On the above courses, to enter Plum Gut and pass through into Gardiner's Bay.—On the W. course through the Sound, when Plum Island Light-house bears S., a mile and three-quarters distant, steer S. by W., which course will lead safely through the gut into Gardiner's Bay, carrying not less than three and a quarter fathoms, passing four hundred yards to the westward of The Middle Ground buoy, a quarter of a mile to the eastward of the beacon on Oyster Pond Reef, and six hundred yards to the westward of Midway Shoal. When in the bay, follow the directions given for Greenport and Sag harbors under their respective heads.

On the above courses, to enter Connecticut River.—When in The Race, with Little Gull Island Light-house bearing SW. by W. $\frac{1}{4}$ W. and New London Light-house N. $\frac{3}{4}$ E., as before, steer W. by N. $\frac{1}{2}$ N., which will lead, with not less than ten fathoms, to abreast of the red buoy off the bar, passing about three-eighths of a mile to the southward of it. Here make signal for a pilot, as this river cannot be entered without one.

On the above courses, to enter New Haven Harbor.—On the W. course through the Sound, when Falkner's Island Light-house bears NE. by E. $\frac{1}{4}$ E., a little over seven miles, and Southwest Ledge Light-house NW. $\frac{3}{4}$ N., eight miles and three-eighths distant, steer for the latter until within three-quarters of a mile of it, in four fathoms, when steer NW., aiming to pass to the westward of the light-house, carrying not less than twenty-two feet; after which follow the directions for the harbor.

On the above courses, to enter Stratford Harbor.—On the **W.** course through the Sound, bring Stratford Point Light-house to bear **NW.**, four miles and five-eighths distant, and steer **NW. $\frac{1}{2}$ N.**, which will lead you up with the bar. Here take a pilot, as the Housatonic River cannot be entered without one. *Sailing Directions—Long Island Sound.*

On the above courses, to enter Port Jefferson Harbor.—Bring Middle Ground Light-house to bear **SW.** by **W. $\frac{3}{4}$ W.** and Old Field Point Light-house **SW. $\frac{1}{2}$ S.** and steer for the latter, carrying not less than fourteen fathoms, until within two miles and three-quarters of it, with Middle Ground Light-house bearing **N. $\frac{1}{2}$ W.** and the summit of Mount Misery **S. $\frac{1}{2}$ E.** Here the depth will be twenty-four fathoms and **SSW.** will lead safely, with not less than four fathoms, to the perpendicularly-striped buoy at the entrance. Here you must take a pilot.

To enter Bridgeport Harbor.—Bring Bridgeport Harbor Light-house to bear **N.** by **W. $\frac{1}{8}$ W.** and steer for it until within three-quarters of a mile of it, in three fathoms water. Here make a signal for a pilot. *Or, if compelled by necessity to run in,* bring the Southwest Beacon (the outermost one) exactly between the two easternmost tall factory chimneys in East Bridgeport on a bearing of **N. $\frac{1}{2}$ E.** and run in on that range, passing about eighty yards to the eastward of the light-house.

To enter Black Rock Harbor.—On the **W.** course through the Sound, bring Penfield's Reef Light-house to bear **NW.** by **W. $\frac{1}{2}$ W.** and Black Rock Light-house **NW.**, and steer **NW. $\frac{1}{2}$ W.** until up with the entrance, when you must follow the directions given for the harbor.

To enter Southport Harbor.—With Penfield's Reef Light-house bearing **NE.** by **N. $\frac{3}{8}$ N.**, distant two miles and three-eighths, and Great Captain's Island Light-house **W. $\frac{3}{8}$ S.**, distant eight miles and a quarter, steer **NW.** by **N.**, which will lead up to the entrance. Anchor in ten feet three hundred yards to the southward of Southport Beacon and wait for a pilot, as the harbor cannot be entered without one.

Wishing to enter Saugatuck River.—When, on the **W.** course through the Sound, Penfield's Reef Light-house bears **NE.** by **N. $\frac{3}{8}$ N.**, two miles and three-eighths distant, you will have ten fathoms, soft bottom, and must steer **W.** by **N. $\frac{3}{4}$ N.**, carrying not less than three and a half fathoms, until within six hundred yards of Cedar Point, with the northeastern end of Cockenoe's Island bearing **SW.** by **S.**, three-quarters of a mile distant. Here you must anchor and wait for a pilot, as the river cannot be entered without one.

To enter Norwalk River from the Eastward by the Cockenoe's Island Passage.—On the **W.** by **S. $\frac{1}{8}$ S.** course through the Sound, bring Norwalk Light-house to bear **W.** by **N.**, four miles and a half, and Eaton's Neck Light-house **SW. $\frac{1}{2}$ S.**, six miles and three-eighths distant, and steer **NW. $\frac{1}{2}$ N.**, which will bring you up with the black spar-buoy on Peck's Ledge; but strangers must anchor on this course, when within half a mile of the buoy, in sixteen feet water, and wait for a pilot.

To enter the Anchorage on the Eastern Side of Long Neck Point.—On the **W.** by **S. $\frac{1}{8}$ S.** course through the Sound, when exactly between Great Captain's Island and Eaton's Neck light-houses, (the former bearing **N. $\frac{1}{4}$ W.**, distant two miles and three-eighths, and the latter **S. $\frac{1}{4}$ E.**, distant three miles and a quarter,) you will have ten fathoms and a **NW.** course will lead safely to the anchorage. You may anchor in from two to three fathoms at discretion, as the water shoals gradually and there is no danger of heading too close in.

To enter Huntington Bay, Northport Bay, and Lloyd's Harbor.—On the **W.** by **S. $\frac{1}{8}$ S.** course through the Sound, when exactly between Norwalk and Eaton's Neck light-houses, with the former bearing **N. $\frac{1}{4}$ W.**, two miles and three-eighths, and the latter **S. $\frac{1}{4}$ E.**, three miles and a quarter distant, steer **S.** by **W. $\frac{1}{4}$ W.**, which will lead safely, with not less than five fathoms, into the bay, and, with not less than three and a half fathoms, to the anchorage off East Neck. If bound to Lloyd's Harbor or Northport Bay, when past East Fort you must follow the directions for those harbors.

To enter Darien River.—When, on the **W.** by **S. $\frac{1}{8}$ S.** course, as before, Norwalk Light-house bears **N. $\frac{1}{4}$ W.** and Eaton's Neck Light-house **S. $\frac{1}{4}$ E.**, steer **NW.** by **W. $\frac{1}{2}$ W.**, which course will lead, with not less than four fathoms, between Long Neck Point and the red buoy on Smith's Rock. Anchor when you come abreast of Long Neck Point and wait for a pilot, as the river cannot be entered without one.

Sailing Directions--Long Island Sound. *To enter Westcott's Cove.*—On the **W.** by **S.** $\frac{3}{8}$ **S.** course through the Sound, when Great Captain's Island Light-house bears **W.** $\frac{1}{4}$ **N.**, distant nearly eight miles, and Eaton's Neck Light-house **SE.** $\frac{1}{2}$ **S.**, distant three miles and three-eighths, steer **NW.** $\frac{1}{4}$ **N.**, which will lead into the cove, passing a quarter of a mile to the westward of the red buoy on Smith's Rock. Anchorage is found in the cove in from six to ten feet at low water, but strangers must not attempt to enter it.

To enter Stamford Harbor (at the mouth of Mill River.)—Bring Great Captain's Island Light-house to bear **W.** $\frac{1}{4}$ **N.** and steer for it until the middle of the entrance to Stamford bears **N.** $\frac{1}{4}$ **W.**, when the woods on the western end of Greenwich Point will bear **NW.** by **W.** $\frac{3}{4}$ **W.** and you will have ten fathoms. Now steer **N.** $\frac{1}{4}$ **W.**, which will lead safely to the anchorage under Shippan Point, where, if bound to Stamford, you must take a pilot.

The above course passes half a mile to the westward of The Cows.

To enter Oyster Bay and Cold Spring Harbor.—When, on the **W.** by **S.** $\frac{1}{8}$ **S.** course, Great Captain's Island Light-house bears **W.** by **N.** $\frac{1}{4}$ **N.**, five and a half miles, and Northwest Bluff **S.** $\frac{1}{4}$ **W.**, two miles and a half distant, you will have thirteen fathoms and must steer **S.** by **W.**, which will lead, with not less than six fathoms, to abreast of Northwest Bluff, where strangers must anchor, *or*, if bound into either of the harbors, must take a pilot.

To enter Little Captain's Island Harbor for an Anchorage, or bound to Greenwich Cove or Cos Cob Harbor.—On the **W.** by **S.** $\frac{1}{8}$ **S.** course through the Sound, bring Great Captain's Island Light-house to bear **WNW.**, four miles and three-quarters distant, and steer **NW.** $\frac{1}{2}$ **W.** until Great Captain's Island Light-house bears **SW.** by **W.**, when you may anchor in from three to five fathoms, good holding-ground; *or*, steer **NE.** by **E.** into Greenwich Cove; *or*, take a pilot for Cos Cob Harbor; *or*, continue the course **NW.** $\frac{1}{2}$ **W.** towards Horse Neck Point and anchor in **Bush's Harbor** in from four to six feet at low water.

To enter Great Captain's Island Harbor and Byram River.—On the **W.** by **S.** $\frac{1}{8}$ **S.** course, when exactly abreast of Centre Island Point, in nine fathoms, Captain's Island Light-house will bear **NW.** $\frac{3}{4}$ **W.**, nearly four miles distant, and **NW.** by **W.** $\frac{3}{4}$ **W.** will lead to the entrance to the harbor, passing six hundred and fifty yards to the southward of the red buoy on Great Captain's Island West Reef and eight hundred yards to the eastward of the black buoy on Blue-fish Reef Shoal. *If bound into Byram River:* Continue the course until within a quarter of a mile of Manursing Island, where you must take a pilot; but if intending simply to anchor in Captain's Island Harbor, when Captain's Island Light-house bears **NE.** $\frac{3}{4}$ **E.**, three-quarters of a mile distant, steer **N.** by **W.** $\frac{3}{8}$ **W.** to the anchorage on the western side of the Calf Islands, where you will have eleven feet, soft bottom. *Or, wishing to anchor between The Calves and Great Captain's Island:* When, on the **N.** by **W.** $\frac{3}{8}$ **W.** course, you come abreast of the red spar-buoy on Great Captain's Island West Reef, steer **NE.** by **N.** $\frac{1}{2}$ **N.**, which will lead, with not less than eleven feet, to the anchorage.

Wishing to enter Hempstead Harbor.—On the **W.** by **S.** $\frac{1}{8}$ **S.** course, when past Matinicock Point, bring Execution Rocks Light-house to bear **W.** by **S.** $\frac{3}{8}$ **S.** and Mott's Point **SW.** by **S.** $\frac{1}{4}$ **S.** and steer for the latter until Red Spring Point bears **E.** $\frac{1}{4}$ **N.**, about three-quarters of a mile distant, when **S.** $\frac{1}{8}$ **E.** will lead into the harbor.

To enter Kellogg's Cove, (between Davenport's Neck and Premium Point.)—On the **W.** by **S.** $\frac{1}{8}$ **S.** course, when Execution Rocks Light-house bears **W.** by **S.** and Sands' Point Light-house **SW.** by **W.**, you will have six and a half fathoms, and **WNW.** will lead safely into the harbor.

Wishing to enter New Rochelle Harbor.—When nearly between Execution Rocks Light-house and Sands' Point Light-house,—the former bearing **N.** by **W.**, seven hundred yards, and the latter **SSE.**, half a mile distant,—steer **W.** by **N.**, which will lead, with not less than three fathoms, to the harbor entrance off the southern end of Davenport's Island. Here you must take a pilot. This course passes about three hundred yards to the southward of Pea Island and the same distance to the northward of the rocky islet between it and The Twins.

To enter Manhasset Bay.—On the **SW.** course from off Sands' Point Light-house, when you come abreast of the buoy on Gangway Rock, steer **S.** by **W.** $\frac{1}{4}$ **W.** towards Hewlett's Point until Throg's Neck Light-house bears **SW.**, when **SE.** $\frac{1}{4}$ **S.** will lead safely into the bay.

To enter the Anchorage between Hart and City Islands.—On the SW. course *Sailing Directions*—*Long Island Sound*. from off Sands' Point Light-house, when Stepping Stones Light-house bears SW. by S. $\frac{1}{2}$ S., one mile, and the southern end of City Island W. $\frac{1}{2}$ S., three-quarters of a mile distant, steer N. by W. $\frac{1}{2}$ W., which will lead, with not less than three fathoms, to the anchorage, passing two hundred yards to the westward of the southern end of Hart Island. Good anchorage is found in this harbor in from three to ten fathoms, good holding-ground, and it is very frequently resorted to by coasters.

To enter Little Neck Bay.—On the SW. by S. $\frac{1}{8}$ S. course towards Throg's Neck, when abreast of Stepping Stones Light-house, in twelve fathoms, steer S. $\frac{3}{4}$ E., which will lead into the harbor, where anchorage is found in from six to ten feet. But this harbor is little resorted to.

2. Having come through Fisher's Island Sound, to enter the Main Channel.—From Bartlett's Reef Light-vessel steer W. $\frac{3}{4}$ S., which will lead, with not less than nine fathoms, into the Main Channel about abreast of Hammonasset Point. On this course, when Falkner's Island Light-house bears NW., distant five miles, and Horton's Point Light-house SE. $\frac{1}{4}$ S., distant nearly seven miles, you are in the Main Channel of Long Island Sound and must steer W., following the directions for that channel on page 384.

The above course passes half a mile to the southward of Bartlett's Reef; more than two miles to the southward of the red buoy on Black-boy Rock; a mile and seven-eighths to the southward of the red buoy on the southern end of Hatchett's Reef; a mile and three-eighths to the southward of the eastern extremity of Long Sand Shoal; about a mile and a quarter to the southward of Cornfield Point Light-vessel; and two miles to the southward of the striped buoy on the western extremity of Long Sand Shoal.

DANGERS

IN APPROACHING, ENTERING AND PASSING THROUGH LONG ISLAND SOUND.

II. By the North Channel, having come from Vineyard Sound or Buzzard's Bay.—The course from Hen and Chickens Light-vessel (at the entrance to Buzzard's Bay) is W. $\frac{1}{2}$ S., which will lead one mile to the southward of Point Judith Light-house. From Vineyard Sound the course is W. $\frac{3}{8}$ N. until Point Judith Light-house bears N. $\frac{3}{8}$ E., one mile distant. From this position vessels may steer either W. Northerly, which will take them through Fisher's Island Sound by the Watch Hill Passage, or W. $\frac{1}{2}$ S., which will lead them to the eastern entrance of Long Island Sound. The dangers on these courses are the same as those described on pages 315–320 and 374–376, to which the mariner is referred.

When in The Race, with Little Gull Island Light-house bearing SW. by W. $\frac{1}{4}$ W., about one mile distant, and New London Light-house N. $\frac{3}{4}$ E., five miles and three-quarters distant, the course through the North Channel is W. by N. $\frac{3}{4}$ N., and there are no dangers unless a vessel is standing to the northward on a wind. In such a case it is necessary to look out for Bartlett's Reef, off the southern end of which is placed a light-vessel, called Bartlett's Reef Light-vessel, and showing two fixed white lights. (See page 348.)

Bartlett's Reef (already described on page 348) is a very dangerous shoal lying off the mouth of Whitestone Creek and about four miles to the westward of the western entrance to Fisher's Island Sound. It extends S. by E. for a mile and a quarter and has upon it many rocks bare at low water. Its southern end bears from Race Rock Light-house NW. by W., *Bartlett's Reef*. distant four miles and a quarter, and is marked by a red spar-buoy (No. 4) placed in three fathoms water. The light-vessel is three-eighths of a mile to the southward of this buoy, and bears from Race Rock Light-house NW. by W. $\frac{1}{4}$ W., four miles distant. From this light-vessel Saybrook Light-house bears W. $\frac{7}{8}$ N., nine miles and three-quarters, and Cornfield Point Light-vessel W. $\frac{1}{4}$ S., twelve miles distant.

When to the westward of Bartlett's Reef strangers should not stand farther to the northward than to bring the light-vessel to bear E. $\frac{3}{4}$ S., by which means the dangerous Black-boy Rock will be avoided. This shoal extends N. by E. and S. by W. for nearly six hundred yards and is bare in places at low water. Its southern end bears W. $\frac{1}{2}$ S. from Black Point, distant three-quarters of a mile, and is marked by a red spar-buoy (No. 4) placed in three fathoms water. From this buoy the red buoy on the southeastern end of Hatchett's Reef bears W. by S. $\frac{1}{2}$ S., two miles distant, and this reef is the next danger met with.

Hatchett's Reef is the eastern extremity of that extensive area of shoal ground which surrounds the mouth of the Connecticut River and has five feet at low water. The reef itself lies off Hatchett's Point, and its southern end bears W. by S. $\frac{1}{2}$ S. from Black Point, distant two miles and three-quarters, and W. $\frac{3}{4}$ N. from Bartlett's Reef Light-vessel,

*Black-boy
Rock.**Hatchett's
Reef.*

distant a little over six miles. It is marked by a red spar-buoy (No. 6) placed in sixteen feet water. Strangers must not attempt to pass to the northward of this reef. (See also page 377.)

From the red buoy on the southern end of Hatchett's Reef the red can-buoy* on the southern extremity of Saybrook Bar bears **W.** by **S.**, about two miles and a half distant. This bar is very dangerous to vessels using the North Channel. It makes to the southeastward from **Saybrook Bar**. Lynde's Point for a mile and three-quarters and to the southward from New Breach Point for a mile and a half,—the depths on it varying from four to nine feet at low water. The buoy is marked No. 8 and placed in eighteen feet water,—Cornfield Point bearing **W.** by **N.** $\frac{3}{4}$ **N.**, three miles and a quarter, and Cornfield Point Light-vessel **W.** by **S.** $\frac{1}{4}$ **S.**, three miles distant. The course passes to the southward of it, and to avoid it while beating vessels must not stand to the northward of Bartlett's Reef Light-vessel bearing **E.** $\frac{1}{2}$ **S.**

The North Channel at this point passes between Saybrook Bar and the eastern extremity of Long Sand Shoal and is but five-eighths of a mile wide. Long Sand Shoal is an extensive sand bar lying nearly **E.** and **W.** and five miles and a quarter long; but it is comparatively narrow,—its greatest width not exceeding a quarter of a mile. The soundings over it vary from seven to sixteen feet. The shoalest part of the spit, which has from seven to nine feet upon it, is about two miles and three-eighths long. The eastern extremity of Long Sand Shoal is nearly two miles **S.** by **E.** $\frac{3}{4}$ **E.** from Saybrook Light-house and five-eighths of a mile **SW.** $\frac{1}{4}$ **W.** from the red can-buoy* on the southern end of Saybrook Bar. There is a spar-buoy, painted red and black in horizontal stripes, placed at this end of the shoal in fifteen feet water,—marking the southern side of the channel, which here passes between this buoy and the red-buoy (No. 8) on Saybrook Bar. Vessels must be careful when in this vicinity, as the width of the channel between the two buoys is only about five-eighths of a mile.

The western extremity of Long Sand Shoal is marked by a nun-buoy* of the second class, painted red and black in horizontal stripes, and bearing from Cornfield Point **SW.** by **W.** $\frac{1}{4}$ **W.**, three miles, and from Cornfield Point Light-vessel **W.** by **N.**, two miles and a quarter distant. A light-vessel, known as Cornfield Point Light-vessel, (see page 349,) is placed about an eighth of a mile to the southward of the shoal and nearly midway of its length, and at night shows one fixed red light. It is not in the North Channel and must not be approached by vessels using that passage.

To avoid Long Sand Shoal when beating through the North Channel vessels should not stand into less than five fathoms on the southern side of the channel.

When past the red can-buoy* on the southern extremity of Saybrook Bar vessels standing to the northward on a wind should go about as soon as Cornfield Point bears **W.** by **N.** $\frac{3}{4}$ **N.**, by which means the southwestern portion of Saybrook Bar (which extends from the can-buoy in nearly a direct line to Cornfield Point) will be avoided. But when about two and a half miles to the westward of that buoy they must look out for Cornfield Point Shoal, sometimes called *Mid-channel Rock*. This is a small detached rock with three feet upon it at low water, and the shoal water surrounding it

Cornfield Point Shoal. covers an area of about an eighth of a mile in diameter within the lines of three fathoms. The rock lies about seven hundred and fifty yards **S.** $\frac{3}{4}$ **E.** from Cornfield Point, and is marked by a red spar-buoy (No. 10) placed in three fathoms on its southern side. This buoy bears from Saybrook Light-house **W.** by **S.** $\frac{7}{8}$ **S.**, a little over two miles and an eighth, and from the red can-buoy* on the southern extremity of Saybrook Bar **W.** by **N.**, three miles and an eighth distant. From this buoy the striped nun-buoy* on the western end of Long Sand Shoal bears **WSW.**, two miles and seven-eighths distant, and Falkner's Island Light-house **W.** $\frac{1}{4}$ **S.** Nearly, twelve miles and a quarter distant. The sailing-line passes well to the southward of this rock.

About seven-eighths of a mile to the westward of *Mid-channel Rock* will be seen an iron spindle painted black and surmounted by a square cage. This is on *The Hen and Chickens*,—a dangerous shoal about five-eighths of a mile long in an **E.** by **S.** and **W.** by **N.** direction and having an average width of about four hundred yards. The spindle is placed on its shoalest part, in three feet water near its southern edge and about four hundred yards from its eastern extremity, and should not be approached from the southward nearer than three hundred and fifty yards. It bears from

	Miles.
Cornfield Point, W SW. -----	$\frac{7}{8}$
The buoy on Mid-channel Rock, W. $\frac{3}{4}$ N. -----	$\frac{3}{8}$
The red can-buoy* on the southern extremity of Saybrook Bar, nearly W. by N. -----	4

Strangers should not attempt to pass on the northern side of either *Mid-channel Rock* or *The Hen and Chickens*, although there is a good passage with from four to six fathoms at low water between them and Cornfield Point. It is used only by those familiar with the locality. The same remark applies to the passage between *Mid-channel Rock* and *The Hen and Chickens*, which is half a mile wide and has from four to seven fathoms.

Seven-eighths of a mile to the westward of the spindle on The Hen and Chickens will be seen a red spar-buoy. This is on Crane Reef, a detached shoal about six hundred yards long in a N. and S. direction and having four feet at low water. The buoy is placed on its southern end in three fathoms, is marked No. 12, and bears from

Crane Reef.

	Miles.
The Hen and Chickens spindle, W. $\frac{1}{4}$ S.-----	$\frac{7}{8}$
Cornfield Point, W. by S. $\frac{1}{4}$ S.-----	$1\frac{3}{4}$
Cornfield Point Light-vessel, NW. $\frac{1}{2}$ N.-----a little over	2

From this buoy

	Miles.
The red buoy on Kelsey's Point Shoals bears W. $\frac{7}{8}$ N.-----a little over	4
The southern extremity of Hammonasset Point Reef W. $\frac{1}{4}$ N.-----	$4\frac{7}{8}$
Falkner's Island Light-house W. $\frac{1}{4}$ S.-----	$10\frac{1}{2}$
The striped nun-buoy on the western end of Long Sand Shoal SW. $\frac{3}{4}$ S.---	$1\frac{1}{2}$

To avoid Crane Reef at night, when in its vicinity, do not stand to the northward into less than six fathoms.

To avoid the western end of *Long Sand Shoal* do not stand to the southward of Falkner's Island Light-house bearing W. $\frac{1}{4}$ N.; or, if the light cannot be seen, do not stand into less than five and a half fathoms.

Duck Island should not be approached from the southward nearer than half a mile, as there are dangerous shoals surrounding it which extend to the southward between five and six hundred yards. There is a narrow passage leading between the island and Menunketesuck Point, but it is not recommended to strangers on account of its obstructions. There is good anchorage on the western side of Duck Island, between it and Kelsey's Point, in from eight to thirteen feet at low water; and this is often made use of during northerly gales.

Nearly two miles to the westward of Duck Island lie Kelsey's Point Shoals,—dangerous ledges making off to the southward from Kelsey's Point for about three-quarters of a mile. The shoalest part of the reef extends about S SW. from Kelsey's Point for three-eighths of a mile, has less than six feet at low water, and many rocks scattered over its surface. Off the southern end of the shoals, which is commonly known as *Stone Island Ledge*, there is placed a red spar-buoy (No. 14) in four fathoms water, as a guide to Killingworth Harbor. It bears from

Kelsey's Point Shoals.

Killingworth Harbor.

	Miles.
The southern end of Duck Island, W. by S.-----about	$1\frac{3}{4}$
The red buoy on Crane Reef, W.-----	4
The striped nun-buoy on the western end of Long Sand Shoal, W NW.---	$3\frac{3}{8}$

To avoid it at night vessels should not go to the northward of Falkner's Island Light-house bearing W. $\frac{1}{2}$ S.

The same rule applied will clear Hammonasset Point Reef, which extends off from the point of that name for half a mile. It is a rocky shoal, bare in some places at low water and in others having from five to fifteen feet. It is not buoyed except upon its western side, where there is placed a red spar-buoy (No. 2) in three fathoms,—Hammonasset Point bearing nearly E NE., seven hundred yards distant. This buoy in its present position is of no use whatever except as a guide to Madison, and a buoy will be recommended to be placed about SE. from the western side of the point, in about four fathoms water.

Hammonasset Point Reef.

When to the westward of Hammonasset Point there are no dangers in the channel; but vessels standing to the northward on a wind must not go farther than to bring Hammonasset Point to bear W. $\frac{1}{4}$ N.; by which means all of the shoals in the bight between that point and Sachem's Head will be avoided. Of these the first met with is Madison East Reef, which lies a little over two miles and a half W. by N. $\frac{1}{2}$ N. from Hammonasset Point and about five-eighths of a mile S. $\frac{3}{4}$ W. from Tuck's Island. It is a narrow shoal, lying nearly E. and W. and about a quarter of a mile long, and twelve feet at low water is reported upon it. A red spar-buoy (No. 4) is placed on its southern side in three fathoms water,—Falkner's Island Light-house bearing SW. $\frac{1}{2}$ W., three miles and three-eighths distant.

Madison East Reef.

A little over half a mile to the westward of the buoy on Madison East Reef will be seen another red spar-buoy. This is on Madison Middle Reef, which extends NW. by W. and SE. by E. for three-eighths of a mile and has four feet at low water. The buoy is placed on the northern side of the reef about midway of its length, is marked No. 6, and bears from Tuck's Island SW. $\frac{3}{4}$ W., seven-eighths of a mile, and from the red buoy on Madison East Reef W. by N. $\frac{1}{4}$ N., about twelve hundred yards distant. There should be a buoy on each end of this reef instead of the present arrangement, and such a change will be recommended.

Madison Middle Reef.

Half a mile **W.** by **S.** from the buoy on Madison Middle Reef is the northern end of a rocky shoal known as Charles' Reef, which lies **NE.** by **N.** and **SW.** by **S.** and is about a quarter of a mile long. Ten feet at low water is found near its northern end and nine feet at its southeastern end. A red spar-buoy (No. 8) is placed close to the southwestern end of the reef in eighteen feet water,—Falkner's Island Light-house bearing **SW.** by **S.**, two miles and three-eighths distant. This buoy bears from

	Miles.
The red buoy on Madison Middle Reef, W SW. -----a little over	$\frac{3}{4}$
The middle of Tuck's Island, SW. by W. $\frac{1}{8}$ W. -----	$1 \frac{5}{8}$
The red buoy on Madison East Reef, W. $\frac{5}{8}$ S. -----	$1 \frac{1}{4}$

It should be removed from its present position to the southeastern end of the reef, and such change will be recommended.

There is a good channel, with from three and a half to four fathoms, on the northern side of the three last-mentioned shoals, which is used by vessels bound to Guilford and Madison; but it is not recommended to strangers.

Under the common name of *Guilford Shoals* are included all of the reefs and ledges which lie off the north shore between Hogshead Point and Sachem's Head. They are for the most part bare at low water and several of them are always out. The most important, as lying nearest to the channel, are Half-acre Island, Lobster Rock and Indian Reef.

Half-acre Island is a mere bare rock, about sixty yards long at low water, with its summit always out, and is surrounded by very dangerous sunken rocks. There is no passage to the northward of it,—bare rocks, and sunken ledges with from two to six feet water, extending all the way to shore;—and it must not be approached from the southward nearer than three-eighths of a mile. The centre of the island bears from Falkner's Island Light-house **N.** $\frac{7}{8}$ **E.**, two miles and a half; from Mulberry Point **E.** $\frac{5}{8}$ **S.**, a mile and an eighth; and from the red buoy on Charles' Reef **NW.** by **W.** $\frac{3}{4}$ **W.**, a little over half a mile distant.

Three-quarters of a mile to the westward of Half-acre Island lies Lobster Rock, which is likewise a small bare islet. At low water it is about seventy yards long in a **N.** by **E.** and **S.** by **W.** direction; but at high water it shows two bare rocks about twenty-five yards **N.** and **Lobster Rock.** **S.** of each other. Dangerous rocks surround it,—many of them bare at low water and some of them always out;—but it may be approached from the southward, within six hundred yards, with not less than three fathoms water. Lobster Rock bears from Half-acre Island **W.** $\frac{3}{4}$ **S.**, three-quarters of a mile, and the channel into Guilford leads between them. From

Mulberry Point it bears SE. by E. $\frac{1}{4}$ E. -----about	900 yds.
Falkner's Island Light-house N. $\frac{3}{4}$ W. -----	$2 \frac{3}{8}$ miles.
Sachem's Head E. by N. -----	$1 \frac{1}{4}$ "

A black spar-buoy (No. 1) is placed in fifteen feet water off the eastern end of the shoals surrounding Lobster Rock, on what is locally known as *Nettie's Reef*. This buoy is a guide for the approach to Guilford Harbor from the eastward.

About two hundred yards to the southwestward of Lobster Rock is the northeastern extremity of Indian Reef, a dangerous rocky shoal lying **NE.** by **E.** and **SW.** by **W.** and about half a mile long. It has many bare rocks upon it, especially near its northeastern end, and soundings over it vary from three to six feet at low water. The southern extremity of this reef (which has three feet and is marked by a red spar-buoy (No. 6) placed in twenty-one feet water off its extremity) bears **W.** from the red buoy on Charles' Reef, two miles and an eighth, and **N NW.** from Falkner's Island Light-house, nearly the same distance. From this southern extremity

	Miles.
The extreme southern point of Sachem's Head bears W. $\frac{1}{8}$ N. -----	$1 \frac{1}{4}$
The beacon on Branford Reef W. $\frac{3}{4}$ S. -----nearly	6
Middle Ground Light-house W. by S. $\frac{1}{4}$ S. -----nearly	22

To avoid all these shoals (that is, those lying between Hammonasset Point and Sachem's Head) vessels should not stand to the northward of Hammonasset Point bearing **E.** $\frac{1}{4}$ **S.**

On the southern side of the channel look out for Kimberley's Reef,—the buoy on which will be visible when you come nearly abreast of Charles' Reef, bearing about **S.** by **W.** $\frac{1}{4}$ **W.**, and three-quarters of a mile off. This is a very small detached shoal, with ten feet water, lying **E.** $\frac{1}{4}$ **N.** from Falkner's Island Light-house, distant about a mile and three-eighths. There is from three to five fathoms on all sides of it and an excellent channel, three-quarters of a mile wide, between it and Falkner's Island. A spar-buoy, painted red and black in horizontal stripes, is placed on its northern side in fifteen feet water, and bears from

	Miles.
The red buoy on the western end of Long Sand Shoal, W. $\frac{1}{4}$ N. Northerly	$8 \frac{1}{2}$
The red buoy on the southern extremity of Crane Reef, W. $\frac{1}{4}$ S. Nearly	$9 \frac{1}{2}$
Hammonasset Point, W. by S. $\frac{1}{4}$ S. -----	4

From this buoy Falkner's Island Light-house bears **W. $\frac{3}{8}$ S.**, a mile and three-eighths, and the black buoy on the northern extremity of Falkner's Island Reef **W. by N. $\frac{1}{4}$ N.**, about the same distance.

To avoid Kimberley's Reef do not, when in its vicinity, stand to the southward of Falkner's Island Light-house bearing **W. by S. $\frac{1}{4}$ S.** But a good rule for day-time is not to shut in Goose Island behind the northern end of Falkner's Island.

Falkner's Island Reef is a narrow rocky shoal, strewn with bare rocks and boulders, which extends in a nearly due **N.** direction from the northern end of the island for three-eighths of a mile. A black spar-buoy (No. 1) is placed in eighteen feet water off its northern end, and bears from

*Falkner's
Island Reef.*

	Miles.
Kimberley's Reef buoy, W. by N. $\frac{1}{4}$ N. -----	1 $\frac{3}{8}$
The striped buoy on the western end of Long Sand Shoal, W. $\frac{1}{2}$ N. -----	9 $\frac{3}{4}$
The red buoy on the southern end of Crane Reef, W. Southerly -----	10 $\frac{1}{2}$
Hammonasset Point, W. $\frac{7}{8}$ S. -----	5 $\frac{1}{4}$
The red buoy on the southwestern end of Charles' Reef, SW. $\frac{1}{4}$ S. -----	2

From this buoy

	Miles.
Falkner's Island Light-house bears S. $\frac{1}{4}$ W. -----	$\frac{1}{2}$
The beacon on Branford Reef W. $\frac{7}{8}$ N. -----	6 $\frac{3}{4}$
Middle Ground Light-house W. by S. $\frac{1}{2}$ S. -----	nearly 22 $\frac{1}{4}$

To avoid Falkner's Island Reef when in its vicinity do not stand to the southward into less than seven fathoms.

Fifteen to sixteen feet at low water is found nearly half a mile to the eastward of Falkner's Island, and vessels of large draught should not, therefore, approach the island from that direction nearer than three-quarters of a mile. The same depths are also found on the western side of the island, between it and Goose Island, in a passage about three-eighths of a mile wide, unsafe for strangers. From the northern end of Goose Island *bare reefs and dangerous sunken ledges* extend to the north-eastward for about half a mile,—the sunken rocks having from two to seven feet upon them. Goose Island should, therefore, receive a berth to the southward of not less than five-eighths of a mile. The common name *Goose Island Ledges* is given to all of the shoals between Falkner's and Goose islands.

The usual course pursued by vessels bound to the westward through the North Channel is, when on the **W. by N. $\frac{1}{8}$ N.** course Falkner's Island Light-house bears **S. by E. $\frac{1}{4}$ E.**, to steer **W. by S. $\frac{1}{8}$ S.**, which will lead them into the Main Channel abreast of Stratford Point. On this course there are no dangers in the channel; but when past Indian Reef, if beating to windward, you must look out on the northern side of the channel for a *dangerous six feet rock* lying about six hundred and fifty yards to the southwestward of the southern extremity of Indian Reef. It is not buoyed, but may be avoided by not going to the northward of the southern extremity of Sachem's Head bearing **NW. by W. $\frac{3}{4}$ W.**, or Hammonasset Point **E. $\frac{1}{4}$ S.** When Falkner's Island Light-house bears **SE. by S.** you are to the westward of this ledge.

The next danger met with on the northern shore is Chimney-Corner Reef, which has thirteen feet at low water and lies about six hundred and fifty yards to the southwestward of Sachem's Head,—the hotel bearing **NE. by N.** There is a good channel on either *Chimney-Corner Reef* side of the reef through which from four to five fathoms may be taken, and both are used by vessels bound into Sachem's Head Harbor. To avoid this reef as well as the Goose Rocks (to the westward of it) vessels should not stand into less than six fathoms when in its vicinity.

The Goose Rocks, which lie about half a mile **NW. $\frac{1}{2}$ W.** from Chimney-Corner Reef, are two large ledges, bare at low water, about **NE.** and **SW.** from each other, and surrounded by shoal water, which extends to the southeastward for three-eighths of a mile and to the southwestward for a quarter of a mile. Near the southwestern end of this reef and close to a *Goose Rocks* three feet rock is placed a red spar-buoy (No. 10). This buoy formerly marked the western side of Chimney-Corner Reef, which is now not marked, and great care must be taken by mariners to avoid the latter. A buoy will be recommended to be placed on this reef as nearly as possible in the former position of the one removed to Goose Rocks.

To avoid the Goose Rocks do not stand to the northward, when in their vicinity, into less than five fathoms.

The next danger met with in beating to the westward is East Ledge, the southernmost of the ledges lying off The Thimbles. It is a detached shoal with six feet at low water and from four to seven fathoms on all sides of it, lies **N NE.** and **S SW.**, and is about three *East Ledge* hundred and fifty yards long. A red spar-buoy (No. 12) is placed in three fathoms off its southern end and bears from Falkner's Island Light-house **W. by N. $\frac{3}{4}$ N.**, five miles and an eighth, and from Chimney-Corner Reef **W. $\frac{3}{8}$ S.**, two miles and three-quarters distant.

To avoid East Ledge do not stand to the northward of Branford Reef Beacon bearing **W. $\frac{1}{4}$ N.**

Next to the westward of East Ledge is Branford Reef, one mile and three-quarters **W. $\frac{1}{4}$ S.** from the buoy. It is easily recognized by the grey stone beacon of circular form, surmounted by an iron shaft and ball, and known as **Branford Reef Beacon**. It is erected upon the summit **Branford Reef** of the reef (which is bare at low water) and nearest its northern end,—shoal water extending from it to the northward two hundred yards and to the southward nearly a quarter of a mile. Branford Reef is a detached shoal, lying **N. by E.** and **S. by W.**, and surrounded by depths varying from four to eight fathoms. The beacon bears from

	Miles.
Falkner's Island Light-house, W. by N. $\frac{1}{4}$ N. -----	6 $\frac{7}{8}$
Sachem's Head, W. $\frac{1}{2}$ S. -----nearly	4 $\frac{3}{4}$
The Outer Thimble, W. by S. $\frac{3}{4}$ S. -----	2 $\frac{3}{8}$

From this beacon

	Miles.
Southwest Ledge Light-house bears W. by N. $\frac{5}{8}$ N. ----- a little over	4 $\frac{3}{4}$
Stratford Point Light-house W. $\frac{3}{4}$ S. -----	14
Middle Ground Light-house SW. by W. $\frac{3}{4}$ W. ----- a little over	16 $\frac{1}{4}$

To avoid Branford Reef do not stand to the northward of Falkner's Island Light-house bearing **E. $\frac{3}{4}$ S.**

When to the westward of Branford Reef there are no dangers until you enter the Main Channel between The Middle Ground and Stratford Point; and thence to Throg's Neck the mariner is referred to the description of the dangers in the Main Channel, on pages 379-384.

Many vessels, however, and especially such as are bound to *New Haven*, do not pass to the southward of Branford Reef, but continue the **W. by N. $\frac{1}{8}$ N.** course, passing about three hundred and fifty yards to the southward of Chimney-Corner Reef and about four hundred and fifty to the southward of the "three feet rock" at the southwestern end of the Goose Rocks. When abreast of The Outer Thimble, and about one hundred and fifty yards from it, there will be seen to the westward, about half a mile off, a red spar-buoy to the northward and a black spar-buoy to the southward of the course,—the former bearing **W. NW.** and the latter **W. $\frac{1}{2}$ S.** The red spar-buoy is on Inner Reef and the black buoy on Wheaton's Reef, and the channel, which is sometimes called the **Thimbles Channel**, passes midway between them.

Inner Reef is the northernmost of the reefs lying off The Thimbles and has nine feet at low water. A red spar-buoy (No. 14) is placed in eighteen feet water on its southern side, and bears from The Outer Thimble **W. by N. $\frac{1}{4}$ N.**, half a mile, and from Falkner's Island Light-house **NW. by W. $\frac{5}{8}$ W.**, five miles and a half distant. From this buoy

	Miles.
The red buoy on The Negro Heads bears W. $\frac{1}{8}$ S. -----	1 $\frac{1}{2}$
Branford Reef Beacon SW. by W. $\frac{3}{4}$ W. -----	2
Black buoy on Wheaton's Reef S. by W. Westerly -----	550 yds.

This latter distance is here the width of the channel.

Wheaton's Reef is a detached ledge, bare at low water and about a hundred and fifty yards in diameter, lying on the southern side of the channel, about twelve hundred yards **W. $\frac{1}{2}$ S.** from The Outer Thimble. It is marked by a black spar-buoy (No. 3) placed in fifteen feet water on its northern side, close to, and bearing from

	Miles.
Sachem's Head, W. $\frac{1}{8}$ N. -----	3
Chimney-Corner Reef, W. $\frac{1}{2}$ N. -----	2 $\frac{3}{8}$
Falkner's Island Light-house, W. NW. Northerly -----	5 $\frac{3}{8}$

From this buoy

	Miles.
The red buoy on Inner Reef bears N. by E. Easterly ----- a little over	$\frac{1}{4}$
Buoy on The Negro Heads W. $\frac{3}{4}$ N. ----- nearly	1 $\frac{1}{2}$
Southwest Ledge Light-house W. $\frac{5}{8}$ N. -----	6 $\frac{3}{8}$
Branford Reef Beacon W. by S. $\frac{3}{4}$ S. ----- a little over	1 $\frac{1}{4}$
East Ledge buoy S. $\frac{1}{4}$ E. -----	$\frac{1}{2}$

Vessels must not attempt to pass to the southward of Wheaton's Reef, or between it and East Ledge, as the ground is foul and the dangerous **Brown's Reef** lies about midway between the reef and the ledge. **Brown's Reef** is nearly a quarter of a mile long in

an E. and W. direction and bare at low water near its western end. It is not buoyed, but the dry part of the reef bears from

Branford Reef Beacon, E. by N. $\frac{1}{8}$ N. -----	Miles.
Wheaton's Reef buoy, S. by W. $\frac{3}{4}$ W. -----	1 $\frac{5}{8}$
East Ledge buoy, N NW. Northerly -----	$\frac{1}{4}$
The Outer Thimble, SW. by W. $\frac{1}{8}$ W. -----	650 yds.
	$\frac{3}{4}$ mile.

When about a mile and three-eighths to the westward of Inner and Wheaton's reefs the sailing-line passes about an eighth of a mile to the southward of the buoy on The Negro Heads, which will appear as a red spar, marked No. 16. The Negro Heads are a mass of boulders bare at low tides, and surrounded by shoal water which extends to the northward three hundred and fifty yards and to the southward two hundred and fifty. The dry part of the shoal lies about eight hundred yards to the southward of Ball Island, and between the two there is a passage with from two to four fathoms. The buoy is placed off the southern end of the shoal in three fathoms, and bears from

The Negro Heads.

The eastern extremity of Ball Island, S. Westerly -----	Miles.
Inner Reef buoy, W. $\frac{1}{8}$ S. -----	$\frac{5}{8}$
Wheaton's Reef buoy, W. $\frac{3}{4}$ N. -----	1 $\frac{3}{8}$
	a little over 1 $\frac{3}{8}$

From this buoy the red buoy on Five Feet Rock bears W. by N. $\frac{1}{8}$ N., a little over a mile and a quarter, and Southwest Ledge Light-house W. $\frac{5}{8}$ N., nearly five miles distant.

In standing to the southward on a wind go about as soon as Southwest Ledge Light-house bears W. by N. $\frac{1}{4}$ N., or Falkner's Island Light-house E. by S. $\frac{1}{4}$ S. This clears *Branford Reef*, passing about a quarter of a mile to the northward of it. This reef has been already described above, and is easily recognized by the circular beacon of grey stone (surmounted by an iron shaft and ball) which stands near its northern end. The customary sailing-line passes about three-quarters of a mile to the northward of it.

When past The Negro Heads look out, on the northern side of the passage, for another red spar-buoy, which will soon be seen bearing about NW. $\frac{1}{4}$ W. and three-quarters of a mile off. This is on Five Feet Rock, a small detached rock, with five feet at low water, lying off the entrance to Branford Harbor. The buoy is marked No. 18, and is placed in fifteen feet close to the rock, on its southern side. It bears from

Five Feet Rock.

Jeffry's Point, SW. by W. $\frac{1}{2}$ W. -----	a little over	Miles.
The red buoy on The Negro Heads, W. by N. $\frac{1}{8}$ N. -----	a little over	1 $\frac{1}{4}$
Branford Reef Beacon, NW. $\frac{3}{4}$ N. -----	a little over	1 $\frac{1}{2}$

From this buoy

Branford Point bears N. by W. $\frac{3}{4}$ W. -----	a little over	Miles.
The Scotch Cap W. $\frac{1}{2}$ N. -----	nearly	1 $\frac{1}{2}$
Southwest Ledge Light-house W. $\frac{1}{4}$ N. -----	a little over	3 $\frac{5}{8}$
The Cow and Calf W. -----		1100 yds.

The Cow and Calf are two small bare rocks surrounded by shoal water and having a detached twelve feet spot a little to the westward of them. They are not buoyed,—being always visible and therefore easily avoided. They lie about five-eighths of a mile SW. by S. $\frac{1}{2}$ S. from Branford Point and a mile and seven-eighths NW. Westerly from Branford Reef Beacon. You may pass on either side of these rocks in going into Branford, but the usual and safest passage is on their eastern side, between them and Five Feet Rock.

The Cow and Calf.

When to the westward of The Cow and Calf do not stand to the northward into less than three and a quarter fathoms in order to avoid the shoal water extending off from the north shore between Branford Entrance and New Haven. This part of the shore is all foul, having many sunken and bare rocks at distances from shore varying from three-eighths to five-eighths of a mile. The most notable of these is The Scotch Cap, which lies off the entrance to Farm River, a mile and a quarter to the westward of Branford Point and three-eighths of a mile from shore. It is a mass of bare rock two hundred yards long E. and W., and, being surrounded by dangerous shoals, should not be approached from the southward nearer than a quarter of a mile.

The Scotch Cap.

Next to The Scotch Cap the most notable rock off this part of the shore is Round Rock, a very small bare rock, surrounded by sunken ledges which extend over an area a quarter of a mile square. It is a mile to the westward of The Scotch Cap and bears from South End SSW. Westerly, between eight and nine hundred yards, and from Morgan's Point SE. $\frac{1}{4}$ S., five-eighths of a mile distant. From this rock Southwest Ledge Light-house bears

Round Rock.

W. $\frac{1}{2}$ N., one mile and a quarter distant. Shoal water extends to the southward from Round Rock for a quarter of a mile, at which distance there is seventeen feet at low water. Large vessels, therefore,—that is, such as draw over seventeen feet,—should be careful not to approach this part of the shore nearer than a mile. A red spar-buoy (No. 20) is placed in fifteen feet water to the southwestward of Round Rock.

Vessels beating through this part of the channel must, when a little to the southeastward of Round Rock, beware of *two detached eighteen feet spots* lying nearly due **S.** from South End and having from three and a half to five fathoms on all sides of them. The northernmost shoal bears **SE.** by **S. $\frac{1}{4}$ S.** from the buoy on Round Rock, distant a little over three-eighths of a mile; and exactly **S.** from this, with a narrow channel between them, lies the southernmost spot,—the distance being nearly a quarter of a mile. These shoals are not particularly dangerous to vessels except those of heavy draught, which should not, when in their vicinity, stand farther to the northward than to bring the beacon on Branford Reef to bear **E. $\frac{3}{4}$ S.** until to the westward of Round Rock buoy.

On the southern side of the channel, bearing **W. $\frac{3}{4}$ S.**, distant two miles and three-quarters from Branford Reef Beacon, and nearly in range with Round Rock buoy and Morgan's Point, lies Townsend's Ledge, another detached eighteen feet spot with deep water all around it. It is about two hundred yards in diameter, and on its southwestern edge is placed a spar-buoy painted red and black in horizontal stripes. This buoy bears from Southwest Ledge Light-house **SE. $\frac{1}{4}$ E.**, distant two miles and a half, and from Stratford Point

Light-house **E. $\frac{3}{4}$ N.**, distant eleven miles and three-eighths. When in its vicinity vessels should watch the bearings carefully and be guided accordingly.

When off New Haven Entrance, with Southwest Ledge Light-house bearing **NW. $\frac{3}{4}$ N.**, distant three-quarters of a mile, there will be seen to the northward of the course, bearing about **W.** by **N. $\frac{1}{2}$ N.** and a mile off, a nun-buoy of the first class, painted red and black in horizontal stripes. This is on Luddington Rock, a sunken rock with fifteen feet at mean low water which lies near the southeastern end of that great mass of shoals making off from the western side of New Haven Harbor, between Sandy and Oyster River points.

The buoy is in sixteen feet on the eastern side of the rock,—Southwest Ledge Light-house bearing **E NE.** and Stratford Point Light-house **W.** by **S. $\frac{3}{4}$ S.**

To avoid Luddington Rock in passing through the North Channel, do not go to the northward of Stratford Point Light-house bearing **W.** by **S. $\frac{1}{2}$ S.**

When past Luddington Rock all dangers met with are common to this and the Main Channel and will be met with and passed in the same order. For full description of these dangers see pages 380-384.

SAILING DIRECTIONS

FOR APPROACHING, ENTERING AND PASSING THROUGH LONG ISLAND SOUND.

II. By the North Channel.—1. Having come from Vineyard Sound or Buzzard's Bay.—The course from Hen and Chickens Light-vessel (at the entrance to Buzzard's Bay) is **W. $\frac{1}{2}$ S.** and passes one mile to the southward of Point Judith Light-house. From Vineyard Sound the course is **W. $\frac{3}{4}$ N.**, which will also lead one mile to the southward of Point Judith. These two courses unite with Point Judith Light-house bearing **N. $\frac{3}{4}$ E.**, distant one mile. Here there will be seven fathoms, rocky bottom, and from this position you may steer either **W. Northerly**, (which will take you up to the entrance to Fisher's Island Sound by the Watch Hill Passage,) or **W. $\frac{1}{2}$ S.**, which will lead to the eastern entrance to Long Island Sound, between Valiant Rock and Little Gull Island. When in The Race, with Little Gull Island Light-house bearing **SW.** by **W. $\frac{1}{4}$ W.**, about one mile distant, and New London Light-house **N. $\frac{3}{4}$ E.**, five miles and three quarters distant, you will have thirty-five fathoms, soft bottom, and must steer **W.** by **N. $\frac{3}{4}$ N.**, which will lead, with not less than fifteen fathoms, to the entrance to the North Channel, between Saybrook Bar buoy and the eastern extremity of Long Sand Shoal. Here there will be four fathoms, with Saybrook Light-house bearing **NW.** by **N. $\frac{1}{4}$ N.**, a mile and three-quarters distant, and Cornfield Point Light-vessel **W.** by **S. $\frac{1}{4}$ S.**, three miles and three-eighths distant. Now steer **W. Northerly**, having soundings varying from three and three-quarters to twelve fathoms, until you come abreast of Hammonasset Point, having it bearing **N. Easterly**, a mile and three-eighths distant, with Falkner's Island Light-house directly ahead and a little over five miles distant. Here there will be thirteen fathoms, soft bottom, and **W.** by **N. $\frac{1}{4}$ N.** will lead, with not less than six and a half fathoms, about midway between Indian Reef and the black buoy on Falkner's Island Reef. When between the two, in about seven fathoms, with Falkner's Island Light-house bearing **S.** by **E. $\frac{1}{4}$ E.**, distant a mile and three-eighths, and the southern extremity of Sachem's Head **NW.** by **W. $\frac{3}{4}$ W.**, distant a mile and seven-eighths, steer **W.** by **S. $\frac{1}{8}$ S.**, which will lead through

the Sound with not less than five and a half fathoms, and will join the Main Channel between Stratford Point and The Middle Ground. Continue this course, carrying not less than nine fathoms, until you come abreast of Huntington Bay, with Norwalk Light-house bearing **N. by E. $\frac{1}{4}$ E.**, distant two miles and three-quarters, and Eaton's Neck Light-house **S. by E. $\frac{1}{2}$ E.**, distant three miles and an eighth. Great Captain's Island Light-house will now bear **W. Northerly**, distant nine miles; you are on the sailing-line of the Main Channel, and must steer **W. by S. $\frac{3}{4}$ S.** to pass between Execution Rocks and Sands' Point, following the directions given for the Main Channel on page 384.

The above courses pass a little over a mile to the southward of Squid Ledge; a mile and three-quarters to the southward of Watch Hill Reef; four hundred yards to the southward of Valiant Rock; three-quarters of a mile to the northward of Little Gull Island Reef; two miles and a half to the southward of Bartlett's Reef Light-vessel; two miles and five-eighths to the southward of Black-boy Rock; a mile and three-eighths to the southward of the red buoy on the southern end of Hatchett's Reef; three hundred yards to the southward of the red buoy on the southern end of Saybrook Bar; six hundred yards to the northward of the eastern end of Long Sand Shoal; nearly three-quarters of a mile to the southward of the red buoy on Mid-channel Rock or Cornfield Point Shoal; eleven hundred yards to the northward of the northern edge of Long Sand Shoal abreast of Cornfield Point Light-vessel; three-quarters of a mile to the southward of the spindle on The Hen and Chickens; the same distance to the southward of the red buoy on the southern end of Crane Reef; nine hundred yards to the northward of the striped nun-buoy on the western end of Long Sand Shoal; a mile and three-eighths to the southward of Duck Island; more than a mile and a quarter to the southward of the red buoy on Kelsey's Point Shoals, and nearly a mile to the southward of the extreme southern point of the shoals; seven-eighths of a mile to the southward of the extreme southeastern end of Hammonasset Point Reef, and a little over a mile and an eighth to the southward of the red buoy on its southwestern side; a mile and a half to the southward of the red buoy on Madison East Reef; the same distance to the southward of the red buoy on Madison Middle Reef; three-quarters of a mile to the northward of the striped buoy on Kimberley's Reef; a little over a mile to the southward of the red buoy on the southwestern end of Charles' Reef; a mile and a quarter to the southward of Half-acre Island; nearly three-quarters of a mile to the northward of the black buoy on the northern end of Falkner's Island Reef; a mile to the southward of Lobster Rock; seven-eighths of a mile to the northward of Goose Island Ledges; three-quarters of a mile to the southward of the southwestern end of Indian Reef; the same distance to the southward of the six feet rock to the westward of Indian Reef; a mile to the southward of Chimney-Corner Reef; a mile and a quarter to the southward of the three feet rock at the southwestern end of the Goose Rocks; a mile and three-eighths to the southward of the red buoy on East Ledge; a mile and five-eighths to the southward of Branford Reef Beacon; a little over two miles to the southward of the red buoy on Stratford Point Shoal; about two miles and a quarter to the northward of Middle Ground Light-house; two miles and seven-eighths to the southward of Penfield's Reef light; two miles and a half to the southward of the red buoy on the southeastern end of Cockenoe's Island Shoal; about two miles and a quarter to the southward of Great Reef Spindle; nearly three miles to the northward of the black buoy on Eaton's Point Shoal; nearly two miles and a quarter to the southward of Green's Ledge; and two miles and three-eighths to the southward of the red can-buoy on the western extremity of Green's Ledge.

But, wishing to pass through the Inner or Thimbles Channel, continue the **W. by N. $\frac{1}{4}$ N.** course past Sachem's Head and The Thimbles, carrying not less than four and a half fathoms, until Branford Reef Beacon bears about **W SW.**, distant two miles, and Southwest Ledge Light-house **W. $\frac{1}{2}$ N.**, distant six miles and a half; when you will be nearly between Inner Reef and Wheaton's Reef and will have about seven fathoms water. Now steer **W. $\frac{1}{2}$ S.**, carrying not less than four and a half fathoms, until Southwest Ledge Light-house bears **N. by W. $\frac{3}{4}$ W.**, distant one mile and three-eighths, when you will have six fathoms, off the entrance to New Haven; and **SW. by W. $\frac{3}{4}$ W.** will lead, with not less than four and three-quarter fathoms, into the Main Channel between Stratford Point and The Middle Ground. On this course, when Stratford Point Light-house bears **NE. by N. $\frac{1}{2}$ N.**, distant three miles and three-quarters, Penfield's Reef Light-house **NW. by W. $\frac{1}{2}$ W.**, four miles and a quarter, and Middle Ground Light-house **SE. by S. $\frac{3}{4}$ S.**, two miles and a quarter distant, you will have about seven fathoms and must steer **W. by S. $\frac{1}{4}$ S.**, following the directions given above for the North Channel.

Sailing Directions—Long Island Sound.

Sailing Directions—The above courses pass five-eighths of a mile to the southward of the three feet rock at the southwestern end of Indian Reef; three hundred and fifty yards to the southward of Chimney-Corner Reef; a quarter of a mile to the southward of the three feet rock at the southwestern end of the Goose Rocks; a hundred and fifty yards to the southward of The Outer Thimble; three hundred and fifty yards to the northward of the black buoy on Wheaton's Reef; an eighth of a mile to the southward of the red buoy on Inner Reef; nearly six hundred yards to the southward of the red buoy on the southern end of The Negro Heads; five-eighths of a mile to the northward of Branford Reef Beacon; three-quarters of a mile to the southward of the red buoy on Five Feet Rock; about the same distance to the southward of The Cow and Calf; one mile to the southward of The Scotch Cap; seven-eighths of a mile to the southward of the southern end of Round Rock; three-eighths of a mile to the southward of the southernmost eighteen-foot spot off Round Rock buoy; half a mile to the northward of Townsend's Ledge; one mile and three-eighths to the southward of Southwest Ledge Light-house; the same distance to the southward of the striped buoy on Luddington Rock; two miles and a quarter to the southward of the red buoy on Pond Point Shoal; two miles and three-quarters to the southward of the red buoy on Welch's or Cedar Point Shoal; and nearly two miles to the southward of the red buoy on Stratford Point Shoal.

Having come through the North Channel, to enter Fisher's Island Sound by the Watch Hill Passage.—With Point Judith Light-house bearing N. $\frac{1}{2}$ E., distant one mile, in seven fathoms, rocky bottom, steer W. Northerly for seventeen miles and a quarter, which will bring you up with the red buoy on the southern side of Gangway Rock, at the entrance to the passage. When past this buoy steer W. $\frac{1}{4}$ N., following the directions for Fisher's Island Sound given on pages 321–322.

To enter Fisher's Island Sound by the Sugar Reef Passage.—On the W. $\frac{1}{2}$ S. course towards The Race, when Watch Hill Light-house bears N. by W. $\frac{1}{8}$ W., distant nearly two miles and a quarter, and the summit of Chocomount W. by N. $\frac{3}{4}$ N., distant five miles and a half, the depth will be twenty fathoms and NW. by N. $\frac{1}{4}$ N. will lead, with not less than five fathoms, through Sugar Reef Passage and into the Main Channel, having Napatree Point directly ahead. On this course, when Dumppling Rock Light-house bears W. $\frac{1}{4}$ N. steer W. $\frac{3}{4}$ N., following the directions for Fisher's Island Sound on pages 321–322.

To enter Fisher's Island Sound by Lord's Passage.—On the W. $\frac{1}{2}$ S. course for The Race, as before, when Watch Hill Light-house bears N. by W. $\frac{1}{8}$ W. and Chocomount W. by N. $\frac{5}{8}$ N., steer for the latter until Stonington Light-house bears N. $\frac{1}{2}$ E., when steer for it, carrying not less than three and a half fathoms through the passage. If bound to the westward through the Sound, when North Hammock Light-house bears W. $\frac{1}{8}$ N. steer W. $\frac{3}{4}$ N., following the directions given on page 321. But, if bound to Stonington, continue the N. $\frac{1}{2}$ E. course towards the light-house, and follow the directions for that harbor on page 333.

To enter Fisher's Island Sound at night from the North Channel.—Bring Watch Hill Light-house to bear N. by W. and steer boldly in towards the beach until the red light on North Hammock opens from behind Fisher's Island on a bearing of W. $\frac{1}{4}$ N. Now steer W. $\frac{3}{4}$ N., following the directions for Fisher's Island Sound on page 321.

To enter Napeague Bay from the North Channel.—On the W. $\frac{1}{2}$ S. course towards The Race, as before, when Watch Hill Light-house bears NW. by W. $\frac{1}{8}$ W., a little over three miles and a half distant, you will have twenty fathoms and must steer SW. $\frac{1}{4}$ W., which will lead, with not less than five fathoms, into the bay, where anchorage may be found under the southern shore in from two to eight fathoms; or under the western shore (Gardiner's Island) in from two to six fathoms. It is not safe to attempt to enter Napeague Harbor without a pilot unless compelled by necessity to do so. In such case pass the eastern point of the entrance at a distance of about four hundred and fifty yards, and, continuing to the southward, pass about midway between this eastern point and the eastern extremity of Goffe's Island; after which keep the eastern shore aboard to the anchorage. These directions carry seven feet at low water across the bar; but there are few buoys, and the channel is narrow and crooked, so that it should never be attempted except under the above circumstances.

Strangers should not attempt to pass into Gardiner's Bay through the passage S. of Ram Island, as it is full of shoals and not buoyed.

To enter Fort Pond Bay.—Continue the **SW. $\frac{1}{4}$ W.** course towards Napeague Bay until you are within a little over two miles of Culloden Point and Montauk Point Light-house bears **SE. by E. $\frac{1}{4}$ E.**, a little over five miles and a half distant and seen over the extremity of Shagwong Point. Here the depth will be eleven fathoms, and **S. $\frac{1}{2}$ W.** will lead, with not less than six fathoms, into the bay, where anchorage may be found in from three to eight fathoms, sheltered from all winds from **E NE.** around by **S. to W SW.**

The **SW. $\frac{1}{4}$ W.** course towards Napeague Bay passes two miles to the southeastward of the striped buoy on Cerberus Shoal and a mile and three-quarters to the northwestward of the black buoy on Shagwong Reef.

To enter Gardiner's Bay from the North Channel.—On the **W. $\frac{1}{2}$ S.** course from off Point Judith, as before, when Block Island North Light-house bears **SE. Southerly**, distant seven miles, and Watch Hill Light-house **W. by N. $\frac{1}{8}$ N.**, about the same distance, you will have eighteen fathoms, and **W. by S. $\frac{1}{4}$ S.** will lead to the entrance to the bay, carrying not less than six fathoms. On this course, when Gardiner's Island Light-house bears **SE. $\frac{3}{4}$ E.**, nearly one mile distant, you will have seven fathoms and must steer **SW. $\frac{1}{8}$ W.** into the bay, carrying not less than five fathoms, until Long Beach Point Light-house bears **WNW.** and Gardiner's Island Light-house **NE. by E. $\frac{1}{4}$ E.**, where you will have five and a half fathoms, and, *if bound to Greenport*, must steer **W. by N. $\frac{1}{4}$ N.**; or, *if bound to Sag Harbor*, **SW. by S. $\frac{3}{4}$ S.**, following in each case the directions given for entering those harbors under their respective heads.

The course for the entrance to the bay passes about two miles and three-eighths to the northward of the striped buoy on Cerberus Shoal and an eighth of a mile to the southward of the striped buoy to the southward of *Constellation Rock*. This buoy is placed on a boulder which has three and three-quarter fathoms on it and which was at first thought to be the rock itself. Recent examinations, however, have resulted in the discovery of its true position, which is nine hundred yards **N. by E. $\frac{5}{8}$ E.** from the buoy. Another striped buoy will be recommended to be placed on this rock.

To enter Connecticut River from the North Channel.—On the **W. by N. $\frac{3}{4}$ N.** course from The Race, when you come abreast of the red can-buoy on the southern extremity of Saybrook Bar and Saybrook Light-house bears **NW. by N. $\frac{1}{4}$ N.**, a mile and three-quarters distant, steer for the light-house until you come into fifteen feet water, where anchor and make signal for a pilot. No stranger should attempt to cross this bar without a pilot, as the channel changes frequently and sailing directions are, therefore, not to be relied upon.

To enter Westbrook Harbor from the North Channel.—On the course **W. Northerly** towards Falkner's Island Light-house, when Saybrook Light-house bears **E NE.**, Cornfield Point Light-vessel **SE. $\frac{5}{8}$ E.**, and Cornfield Point **NE. $\frac{3}{4}$ E.**, you will be nearly abreast of Crane Reef and **NW. by N. $\frac{3}{8}$ N.** will lead into the harbor. Anchorage may be found in from seven to thirteen feet, sheltered from all except southerly winds.

The above course into the harbor passes four hundred yards to the westward of the red buoy on Crane Reef.

To enter the Anchorage between Menunketesuck Point and Kelsey's Point.—On the **W. Northerly** course through the North Channel, when Duck Island bears **N. $\frac{3}{4}$ W.**, a mile and three-eighths distant, and Falkner's Island Light-house **W. Northerly**, eight miles and a half distant, you will have nine and a half fathoms and **NW. by N. $\frac{1}{2}$ N.** will lead safely into the bight. If the wind be to the westward, anchor on this course under Kelsey's Point; but if it be to the eastward, as soon as the southern end of Duck Island bears **W.** steer **NE. $\frac{3}{4}$ N.**, and either anchor on this course according to draught or round the northern end of Duck Island, giving it a berth to the southward of about six hundred yards, and anchor in from fourteen to sixteen feet under Menunketesuck Point.

To enter Killingworth Harbor from the North Channel.—On the **W. Northerly** course towards Falkner's Island Light-house, when Hammonasset Point bears **NW. $\frac{3}{4}$ W.**, distant two miles and three-eighths, you will have about ten fathoms and must steer **NW. by N. $\frac{3}{8}$ N.**, which will lead safely up to the anchorage. Anchor in from ten to twelve feet abreast of the black buoy off Hammonasset Point Spit; and if bound to Clinton take a pilot.

Sailing Directions—The above course passes a quarter of a mile to the westward of the red buoy on Kelsey's Point Shoals; about one hundred and fifty yards to the westward of the red Island Sound. buoy on Wheeler's Rock; and the same distance to the eastward of the black buoy off Hammonasset Point Spit.

To make an anchorage off Madison.—On the W. Northerly course for Falkner's Island light, as before, when Hammonasset Point bears N. $\frac{1}{8}$ W., a mile and three-eighths distant, you will have thirteen fathoms, soft bottom, and NW. will lead safely in between Tuck's Island and Madison East Reef. You may anchor on this course according to draught, or take a local pilot and go alongside the wharves.

The above course passes four hundred yards to the northeastward of Madison East Reef and six hundred yards to the southward of Tuck's Island.

To enter Guilford Harbor from the North Channel.—On the W. by N. $\frac{1}{8}$ N. course leading to the northward of Falkner's Island, when Falkner's Island Light-house bears SW. by W. $\frac{5}{8}$ W., distant about a mile and three-quarters, and the southern extremity of Sachem's Head W. by N. $\frac{3}{4}$ N., distant three miles and seven-eighths, you will have seven and three-quarter fathoms, and NW. $\frac{1}{2}$ N. will lead into the harbor, carrying not less than eight feet at low water. Vessels bound to Guilford must anchor in the Outer Harbor and take a pilot.

The above course passes a little over half a mile to the westward of the red buoy on Charles' Reef; an eighth of a mile to the westward of Half-acre Island; and half a mile to the eastward of the dry part of Lobster Rock.

To enter Sachem's Head Harbor by the Eastern Channel.—On the W. by N. $\frac{1}{8}$ N. course, as before, when Falkner's Island Light-house bears SE. $\frac{1}{4}$ E. steer NW. $\frac{1}{4}$ W., keeping the light-house directly astern. This course will lead, with not less than four fathoms, safely through the passage to the eastward of Chimney-Corner Reef until the hotel bears NE. $\frac{3}{4}$ E. and the extremity of Joshua's Point N. $\frac{3}{4}$ W. Now steer about for the point, which will bring you up with the entrance; after which you must follow the directions given for the harbor.

The above courses pass two hundred yards to the eastward of Chimney-Corner Reef; three hundred yards to the westward of the southern extremity of Sachem's Head; and about one hundred yards to the eastward of the eastern extremity of Goose Rock Shoals.

To enter Sachem's Head Harbor by the Western Channel.—Bring Joshua's Point to bear N. $\frac{1}{8}$ W. and steer for it, which will bring you up with Chimney-Corner Reef. Pass to the westward of this reef and continue the course, which will bring you up with the entrance; after which follow the directions for the harbor.

To enter the Anchorage between High Island and the Bare Islands.—With the hotel on Sachem's Head bearing E. by N. $\frac{3}{8}$ N. and The Outer Thimble W. by N. $\frac{5}{8}$ N., steer N. by W. $\frac{3}{4}$ W. towards Flying Point, which will lead, with not less than seventeen feet, to the anchorage. Strangers, however, must not attempt to enter by this passage, as it is extremely narrow and is not buoyed. The same is true of the numerous passages among the Thimble Islands, all of which have good water in them, but are frequented only by vessels with local pilots on board.

To enter the Anchorage on the Eastern side of Horse Island.—On the W. by N. $\frac{1}{8}$ N. course, as before, when within eight hundred yards of The Outer Thimble and the northeastern extremity of East Island bears N. $\frac{3}{4}$ W., a little over half a mile distant, steer that course until within about two hundred yards of Pot Rock Island, when haul to the westward towards the southern end of East Island and anchor at discretion.

To enter the Anchorage between Kidd's Island and Horse Island.—Round the two outer Thimble Islands at a distance of an eighth of a mile and steer N. $\frac{1}{2}$ W. until the southern end of East Island bears NE. by E. $\frac{3}{4}$ E., when steer NE. by E., and anchor between Kidd's and East islands in from fifteen to sixteen feet at low water.

The Anchorage to the Westward of Brown's or Haycock Point may be entered by obeying the following directions: When abreast of the red buoy on Inner Reef and two hundred yards from it, steer N. by W. $\frac{3}{4}$ W., which will lead to the anchorage. But this passage is dangerous and must never be attempted by strangers. Anchorage is found in this bight in from seven to twelve feet at low water.

To enter the Anchorage to the Eastward of Flagg and Ball Islands.—On the *Sailing Directions*—*Long Island Sound*. $\frac{1}{2}$ S. course from between Inner and Wheaton's reefs, when within five-eighths of a mile of the buoy on The Negro Heads, with Branford Reef Beacon bearing SW. $\frac{3}{4}$ W., distant a mile and a quarter, and Southwest Ledge Light-house W. $\frac{3}{4}$ N., distant about five miles and a half, steer NW. by N. $\frac{1}{4}$ N., which will lead to the anchorage, passing four hundred yards to the eastward of Ball Island; two hundred and fifty yards to the eastward of Flagg Island; and four hundred yards to the westward of the dry rocks on the eastern side of the passage.

To enter Branford Harbor by the passage between Jeffry's Point and Taunton Rock.—On the W. $\frac{1}{2}$ S. course from between Inner and Wheaton's reefs, when Southwest Ledge Light-house bears W. by N., about four miles and a half distant, and Branford Reef Beacon S. $\frac{1}{8}$ E., seven-eighths of a mile distant, steer NNW., which will lead safely into the harbor, passing an eighth of a mile to the westward of Jeffry's Point and the same distance to the eastward of Taunton Rock. Anchor in from nine to twelve feet abreast of the red buoy on Bird Reef; and, if bound to Branford, take a pilot.

To pass to the Westward of Taunton Rock and enter Branford Harbor.—With Southwest Ledge Light-house bearing W. by N. and Branford Reef Beacon S. $\frac{1}{8}$ E., as before, steer NW. $\frac{1}{4}$ N. for one mile, passing a quarter of a mile to the westward of Taunton Rock and an eighth of a mile to the eastward of the red buoy on Five Feet Rock. On this course, when you come abreast of Taunton Rock steer N. by E. $\frac{1}{8}$ E. into the harbor, and anchor in from nine to twelve feet, as before.

To enter the Anchorage on the Western side of Branford Point.—On the W. $\frac{1}{2}$ S. course from between Inner and Wheaton's reefs, as before, when Southwest Ledge Light-house bears W. by N. $\frac{3}{4}$ N., distant three miles, and Branford Point N. by E. $\frac{1}{8}$ E., distant a mile and a half, steer N. Easterly, and anchor in from seven to ten feet, according to draught. This course passes an eighth of a mile to the westward of Branford Point Reef.

To enter New Haven Harbor from the North Channel.—On the W. $\frac{1}{2}$ S. course through this channel, as before, when Southwest Ledge Light-house bears N. by W. $\frac{3}{4}$ W., distant one mile and three-eighths, you will have six fathoms and must steer NW. by N. $\frac{3}{4}$ N., carrying not less than three and a half fathoms, until past Southwest Ledge Light-house and the old New Haven Light-tower bears NE. $\frac{3}{8}$ N., distant one mile, and Southwest Ledge Light-house E., distant a quarter of a mile. Here you will have four fathoms, and the course in will be N. by E. $\frac{1}{4}$ E., following the directions for the harbor.

To enter the Anchorage off Indian River (Milford Harbor) from the North Channel.—On the SW. by W. $\frac{3}{4}$ W. course from off New Haven Entrance, when Stratford Point Light-house bears W., distant four miles and an eighth, steer NW. by N. $\frac{1}{4}$ N. to the anchorage, passing a quarter of a mile to the westward of the red buoy on Welch's or Cedar Point Shoal and five-eighths of a mile to the eastward of Charles' Island. Good anchorage is found in from seven to fourteen feet at low water, and there is nothing in the way.

To enter Stratford Harbor and Housatonic River from the North Channel.—On the SW. by W. $\frac{3}{4}$ W. course from off New Haven, when Stratford Point Light-house bears W., distant four miles and an eighth, and Middle Ground Light-house SW. $\frac{1}{4}$ W., distant eight miles, you will have seven and a half fathoms and must steer W. $\frac{3}{4}$ N. towards Stratford Beacon. When within a mile and a half of the light-house keep the lead going, and anchor in three and a half fathoms five-eighths of a mile from the beacon and wait for a pilot, as this harbor cannot be entered without one.

2. **Having come through Fisher's Island Sound, to enter the North Channel.**—From Bartlett's Reef Light-vessel steer W. $\frac{1}{4}$ N., which will lead safely to the entrance between Saybrook Bar and the eastern extremity of Long Sand Shoal. When between the two, with Saybrook Light-house bearing NW. by N. $\frac{1}{4}$ N., distant a mile and three-quarters, steer W. Northerly, and follow the directions for the North Channel given on pages 396–397.

On the above course, to enter Niantic Bay.—When a little over half a mile to the westward of Bartlett's Reef Light-vessel, with the southwestern extremity of Black Point bearing NW. by W. $\frac{1}{4}$ W., steer NW. by N. $\frac{1}{4}$ N., which will lead safely into Niantic Bay, where you may anchor in from twelve to twenty-two feet, good holding-ground.

Sailing Directions—The above course passes nine hundred yards to the westward of Bartlett's Reef; five-eighths of a mile to the westward of Two Tree Island; four hundred yards to the westward of the red buoy on Little Rock; and three hundred yards to the westward of White Rock.

On the W. $\frac{1}{4}$ N. course from Bartlett's Reef Light-vessel, to enter the Anchorage on the Western side of Black Point.—With Bartlett's Reef Light-vessel bearing E. $\frac{1}{4}$ S., distant about two miles and three-quarters, Saybrook Light-house W. by N. $\frac{1}{4}$ N., distant nearly seven miles, and the middle of Black Point N. by W. $\frac{1}{2}$ W., distant one mile and five-eighths, steer NW. by N. $\frac{1}{2}$ N., which will lead safely to the anchorage, passing nine hundred yards to the eastward of the red buoy on Black-boy Rock and three hundred and fifty yards to the westward of Black Point. Anchor in from thirteen to seventeen feet, according to draught.

To enter Four Mile River.—With Saybrook Light-house bearing W. by N. $\frac{1}{4}$ N. and the middle of Black Point N. by W. $\frac{1}{2}$ W., as before, steer NW. $\frac{1}{4}$ W., which will lead, with not less than fourteen feet, to the river entrance. Here anchor in from thirteen to sixteen feet, and, if bound to South Lyme, take a pilot.

SAILING DIRECTIONS

FOR APPROACHING, ENTERING AND PASSING THROUGH LONG ISLAND SOUND.

III. *By the South Channel.*—1. *From Black Island Sound.*—The dangers in this channel are the same as those described on pages 375–384, under the head of “Dangers” in the Main Channel, and are met with in the same order. They need not, therefore, be repeated here.

When in The Race, with Little Gull Island Light-house bearing SW. by W. $\frac{1}{4}$ W. and New London Light-house N. $\frac{3}{4}$ E., steer W. as though to enter the Main Channel. But, on this course, when Plum Island Light-house bears SE. $\frac{3}{4}$ S., distant two miles and an eighth, and Saybrook Light-house NW. $\frac{3}{4}$ N., distant a little over six miles, steer W. by S. $\frac{1}{4}$ S., which course will lead, with not less than twelve fathoms, along the southern shore of the Sound until nearly up with Herod's Point. On this course, when in twenty fathoms, with Falkner's Island light bearing NE. by N. Nearly, distant twelve miles, Friar's Head SSE. Southerly, distant three miles and three-quarters, and Herod's Point SW. $\frac{1}{4}$ W., distant four miles and a quarter, steer W. $\frac{1}{4}$ N., which course will lead, with not less than four fathoms, into the Main Channel off the entrance to Oyster Bay,—the only soundings less than eight fathoms being found off Eaton's Point Shoal. When abreast of the entrance to Oyster Bay, with Great Captain's Island Light-house bearing W NW., distant four miles and three-quarters, and the middle of Oak Neck Point SW. by S. $\frac{1}{2}$ S., distant two miles and three-eighths, you are in the Main Channel and must steer W. by S. $\frac{3}{8}$ S., following the directions for the Main Channel on page 384.

The above courses pass a mile and an eighth to the northward of Orient Shoal; two miles and three-eighths to the northward of the black buoy on Roanoke Point Shoal; a mile and five-eighths to the northward of Herod's Point Shoal; a mile and three-eighths to the northward of Rocky Point Shoal; three-quarters of a mile to the northward of the black buoy on Mount Misery Shoal; three miles and a quarter to the southward of The Middle Ground; a mile and five-eighths to the northward of Crane Neck Point; over three-quarters of a mile to the northward of the black buoy on Eaton's Point Shoal, and five hundred yards to the northward of the northern end of that shoal; nearly three-quarters of a mile to the northward of the black buoy on Lloyd's Point Shoal; a mile and a half to the northward of the black buoy on Centre Island Reef, and a little over a mile and a quarter to the northward of the northern extremity of that reef.

On the above courses, to enter Plum Gut and pass through into Gardiner's Bay.—On the W. course from The Race, when Plum Island Light-house bears S., distant one mile and three-quarters, steer S. by W., which course will lead, with not less than three and a quarter fathoms, into Gardiner's Bay, passing four hundred yards to the westward of the buoy on The Middle Ground, a quarter of a mile to the eastward of the beacon on Oyster Pond Reef, and six hundred yards to the westward of Midway Shoal. When in the bay follow the directions given for Greenport or Sag Harbor, according as you are bound.

But vessels of larger draught than eighteen feet must, when on the **S. by W.** *Sailing Directions*—*Long Island Sound.* course Plum Island Light-house bears **NE.** by **E.** $\frac{1}{4}$ **E.**, between eight and nine hundred yards distant, steer **SE.** $\frac{1}{4}$ **E.**, carrying not less than nine fathoms, until the southern extremity of Pine Point bears **NE.** $\frac{1}{4}$ **N.**, when **SW.** $\frac{1}{4}$ **S.** will lead into the Greenport Channel, or **SSW.** Southerly will lead into the Sag Harbor Channel.

To enter Port Jefferson Harbor from the South Channel.—On the **W.** $\frac{1}{4}$ **N.** course from off Friar's Head, when Old Field Point Light-house bears **W.** by **S.** $\frac{1}{2}$ **S.**, distant three miles and three-quarters, steer for the light until you come abreast of the black buoy on Mount Misery Shoal, when steer **SW.** $\frac{1}{2}$ **W.**, which will bring you up to the perpendicularly-striped buoy off the entrance to the harbor, in four and a quarter fathoms. Here you must take a pilot.

To enter Huntington Bay from the South Channel.—On the **W.** $\frac{1}{4}$ **N.** course, as before, when Eaton's Neck Light-house bears **S.**, distant a mile and an eighth, and Lloyd's Point **W.** by **S.** $\frac{1}{4}$ **S.**, distant nearly four miles and a quarter, steer **SW.** by **S.** $\frac{1}{4}$ **S.** until the light-house bears nearly **E.** by **N.**, a little over three-quarters of a mile distant. Now steer **S.** $\frac{3}{4}$ **W.**, which will lead, with not less than three and a half fathoms, to the anchorage under East Neck.

To enter Oyster Bay and Cold Spring Harbor from the South Channel.—On the **W.** $\frac{1}{4}$ **N.** course, as before, when Lloyd's Point bears **S.** by **E.** $\frac{1}{4}$ **E.**, distant a mile and an eighth, Northwest Bluff **S.** $\frac{3}{4}$ **W.**, about two miles and an eighth, and Great Captain's Island Light-house **W.** by **N.** $\frac{1}{4}$ **N.**, five miles and three-quarters distant, steer **S.** by **W.** $\frac{3}{8}$ **W.** towards the eastern extremity of Centre Island, which course will lead, with not less than three and a half fathoms, to abreast of Northwest Bluff. Here strangers must anchor; or if bound into either of the harbors must take a pilot.

2. Having come through Fisher's Island Sound, to pass to the southward of The Middle Ground and into the South Channel.—From Bartlett's Reef Light-vessel steer **W.** $\frac{3}{4}$ **S.**, which course will lead, with not less than nine fathoms, into the South Channel off Smithtown Bay. On this course you will make Eaton's Neck Light-house directly ahead; and when it is about five miles and three-quarters off, with the western extremity of the cliffs to the eastward of The Broken Land bearing **SSW.** and Norwalk Light-house **NW.** $\frac{3}{4}$ **W.**, you are in the South Channel and must steer **W.** $\frac{1}{4}$ **N.**, following the directions for that channel given above.

The above course passes half a mile to the southward of Bartlett's Reef; more than two miles to the southward of the red buoy on Black-boy Rock; one mile and seven-eighths to the southward of the red buoy on the southern end of Hatchett's Reef; one mile and three-eighths to the southward of the eastern extremity of Long Sand Shoal; about a mile and a quarter to the southward of Cornfield Point Light-vessel; two miles to the southward of the striped buoy on the western end of Long Sand Shoal; four miles to the southward of Falkner's Island; a mile and a half to the southward of The Middle Ground; and two miles and five-eighths to the northward of the black buoy on Mount Misery Shoal.

DANGERS

IN APPROACHING, ENTERING AND PASSING THROUGH LONG ISLAND SOUND.

III. Coming from Seaward through Block Island Sound, by the passage between Block Island and Montauk Point.—The course from Davis' South Shoal Light-vessel towards Montauk Point is **W.** by **N.** $\frac{1}{4}$ **N.** until you make the light-house directly ahead, eight miles and three-quarters distant. Here the depth will be twenty-seven fathoms, with the western extremity of Block Island bearing **NE.** by **N.** $\frac{1}{2}$ **N.** and Block Island Southeast Light-house **NE.** $\frac{1}{2}$ **E.**, distant seven miles and five-eighths; and from this position the course is shaped for The Race.

The course from outside of Nantucket Shoals (say from the usual point of departure for foreign vessels,—Latitude $40^{\circ} 40' N.$, Longitude $69^{\circ} 19' W.$) is **W.** by **N.** $\frac{3}{8}$ **N.** for Montauk Point until the light-house is made directly ahead, distant eight miles and three-quarters. Here you will have twenty-eight fathoms,—the western extremity of Block Island bearing **NE.** by **N.** $\frac{3}{4}$ **N.** and Block Island Southeast Light-house **NE.**, distant eight miles and a half. From this position the course is shaped for The Race.

With a fair wind the above courses meet with no dangers until well into Block Island Sound. But should you be obliged to turn to windward you must look out, on the northerly tack, for Southwest Ledge, which is, however, only dangerous in heavy winds from **E.** around by **S.** to **W.**, when it breaks with violence. It has from five to six fathoms upon it, lies **NE.** by **E.** and **SW.** by **W.**, and covers an area a mile and a half long

**Southwest
Ledge.**

by five-eighths of a mile wide. Its northeastern end is two miles and a half from the southwestern end of Block Island,—bearing from Block Island Southeast Light-house **W. $\frac{1}{2}$ S.**, distant nearly five miles;—and its southwestern end bears from the same light-house **W. by S. $\frac{3}{8}$ S.**, distant six miles and an eighth. Until to the westward of this ledge, therefore, vessels should not stand farther to the northward than to bring Block Island Southeast Light-house to bear **E. by N. $\frac{3}{4}$ N.**, or Montauk Point Light-house **W. $\frac{1}{4}$ S.**

When on the Montauk side of the channel large vessels should not stand farther to the southward than to bring Montauk Point Light-house to bear **NW. by N.** to avoid a dangerous rocky shoal, called Montauk Shoal, which has four fathoms upon it and lies to the southward of Montauk Point. The shoalest part of this reef lies two miles and a half **S. by E.** from Montauk Point Light-house and breaks heavily in strong gales from **E.** around by **S.** to **W.** There are usually strong rips over it, which will serve to indicate its position.

In beating to the westward towards The Race large vessels must not approach Montauk Point nearer than two miles and a half, as there is a large area of shoal ground extending to the eastward of that point with depths varying from four to six fathoms. The name **Phelps' Ledge.** Phelps' Ledge has been given to the shoalest part of this shoal ground, and which extends nearly due **N.** and **S.** for a mile and three-quarters, at a distance of about a mile and a half to the eastward of Montauk Point. At the southern extremity of this ledge is a small rock, with four fathoms, known as Great Eastern Rock, from the circumstance of its discovery by the vessel of that name striking upon it. It bears from Montauk Point Light-house **E. $\frac{1}{2}$ N.** North-

Great Eastern Rock. erly, distant a mile and a half; and is marked by a first class nun-buoy* painted black. It is placed about a quarter of a mile **SW. by W.** from the rock and should, therefore, not be approached by vessels from the eastward nearer than three-quarters of a mile. In its present position this buoy is not so valuable an aid to navigation as it would be if placed to the southeastward of the rock, as vessels using the Montauk Channel pay no attention to Great Eastern Rock, while those from the eastward would be much better served if the buoy were to the eastward of the rock. Such change will be recommended.

There are usually strong tide-rips over Phelps' Ledge and between the ledge and Montauk Point. When to the westward of Montauk Point do not stand farther to the westward than to bring Montauk Point Light-house to bear **SE. by S. $\frac{1}{4}$ S.**, in order to avoid Washington Shoal and Shagwong Reef; or do not go to the westward of Race Rock Light-house bearing **NW. by N. $\frac{1}{4}$ N.**

Washington Shoal is a sand shoal about a mile and a half long between the lines of three fathoms and has twelve feet at low water on its shoalest part. It extends **NW. by W. $\frac{1}{2}$ W.** and **SE. by E. $\frac{1}{2}$ E.**, and its shoalest part is between twelve and thirteen hundred yards **N.** by **E. $\frac{1}{2}$ E.** from Shagwong Point. There is a passage between the shoal and the point with between three and four fathoms, but it is rarely used and is not fit for strangers.

Shagwong Reef is a detached rocky shoal, with five feet at low water, lying **N NW.** and **SSE.** and about a mile and five-eighths to the northward of Shagwong Point. The shoal **Shagwong Reef.** of the reef covers an area three-eighths of a mile long by a quarter of a mile wide, and has soundings varying from five to eighteen feet at low water. A nun-buoy* of the first class, painted black and marked No. 5, is placed in four fathoms a quarter of a mile to the eastward of the shoal of the reef and bears from Montauk Point Light-house **NW. by N.**, distant three miles and five-eighths. From this buoy

	Miles.
Race Rock Light-house bears NW. by N. $\frac{3}{8}$ N. -----	9 $\frac{3}{8}$
The buoy on Valiant Rock NW. $\frac{3}{8}$ N. -----	9 $\frac{1}{2}$
Little Gull Island Light-house NW. $\frac{3}{8}$ W. ----- a little over	10
Gardiner's Island Light-house W. by N. $\frac{1}{2}$ N. -----	10 $\frac{1}{2}$

On the course through Block Island Sound for The Race, when to the westward of Shagwong Reef you will see the striped buoy on Cerberus Shoal, which will appear to the northward of the course. This shoal is sometimes called *The Middle Ground*, from its position nearly midway between the northern and southern shores of Block Island Sound,—being five miles and three-quarters to the northward of Shagwong Point (the nearest part of Long Island) and five miles and an eighth to the southward of Prospect Point, (the nearest part of Fisher's Island.) It is of small extent, has thirteen feet at low water, and is marked by a can-buoy* of the second class, painted red and black in horizontal stripes, placed in eighteen feet close to the rock on its eastern side,—Montauk Point Light-house bearing **SE. by S. $\frac{1}{2}$ S.**, distant seven miles and a half, and Shagwong Reef buoy **S. by E. $\frac{3}{4}$ E.**, distant nearly four miles. From this buoy

	Miles.
Prospect Hill (on Fisher's Island) bears N. by W. $\frac{1}{2}$ W. ----- nearly	5 $\frac{1}{2}$
Race Rock Light-house NW. $\frac{3}{8}$ N. -----	5 $\frac{3}{8}$
The striped buoy on Valiant Rock NW. $\frac{3}{8}$ W. -----	5 $\frac{1}{8}$
Little Gull Island Light-house NW. by W. $\frac{3}{8}$ W. -----	7

When Race Point bears **NW. by N. $\frac{3}{4}$ N.** you are clear of this shoal and to the westward of it.

THE FOLLOWING INFORMATION WAS RECEIVED AFTER THIS VOLUME HAD GONE TO PRESS.

The Light-house Board, under date of April 15, 1881, has given notice that a "Whistling Buoy," painted red and black in horizontal stripes, has replaced the can-buoy on Cerberus Shoal. This buoy is anchored in seven fathoms about two hundred and fifty yards **E SE.** from the shoal, and on the following bearings:

	Miles.
Montauk Point Light-house, SE. by S. $\frac{5}{8}$ S. Southerly -----	7 $\frac{1}{2}$
Watch Hill Light-house, NE. $\frac{3}{8}$ N. -----	8 $\frac{1}{2}$
Race Rock Light-house, NW. $\frac{3}{4}$ N. -----	5 $\frac{1}{2}$
Gardiner's Island Light-house, W. $\frac{1}{4}$ S. -----	8 $\frac{1}{2}$
Little Gull Island Light-house, NW. by W. $\frac{3}{4}$ W. -----	7 $\frac{1}{2}$

There are usually strong tide-rips in the vicinity of Cerberus Shoal, especially on its eastern side.

When approaching The Race, vessels in beating should not stand to the westward of Little Gull Island Light-house bearing $N. \frac{1}{4} W.$ to avoid Constellation Rock, a boulder with twenty-one feet at mean low water, lying in the entrance to Gardiner's Bay, and about a mile and three-quarters $S.$ by $W. \frac{1}{4} W.$ from Little Gull Island Light-house and two miles and a half $NE. \frac{1}{2} E.$ from Gardiner's Island Light-house. The rock is very small and surrounded by depths of not less than six fathoms. There is no buoy on it, but about eight hundred yards $S.$ by $W. \frac{3}{8} W.$ from it there is another boulder with three and three-quarter fathoms, which is marked by a large spar-buoy painted red and black in horizontal stripes. Vessels bound into Gardiner's Bay by passing to the southward of this buoy avoid all danger.

*Constellation
Rock.*

After passing Cerberus Shoal there are no dangers in the channel until you enter The Race, after which all dangers met with between The Race and Throg's Neck will be found described on pages 375-384, under the head of "Dangers" in the Main Channel.

SAILING DIRECTIONS

FOR APPROACHING, ENTERING AND PASSING THROUGH LONG ISLAND SOUND.

IV. Coming from Seaward through Block Island Sound, by the passage between Block Island and Montauk Point.—The name Block Island Channel, which properly belongs to this passage, has by usage been extended to embrace all of the approach south of Block Island and inside of one hundred fathoms. It is by no means uncommon, therefore, to hear navigators speak of coming into or crossing Block Island Channel in from fifty to eighty fathoms; and in fact the "blue mud" and "green ooze" found in the channel are excellent indications of a vessel's position. Vessels which have come outside of Nantucket Shoals do not, however, enter this channel until Block Island is in sight, and soundings are of but little use in determining their position. In thick weather the lead should be kept going, however, and strangers should not stand to the northward or westward into less than twenty fathoms until it clears up.

The first land seen on approaching Block Island Sound from seaward is a very remarkable dome-shaped hill, called **Lantern Hill**. It is about five miles to the northward of Mystic on the north shore, and when first seen on approaching the Sound on the courses given below will bear about $NW.$ by $N. \frac{3}{4} N.$

1. Having crossed Nantucket Shoals to Davis' South Shoal Light-vessel.—From the light-vessel steer $W.$ by $N. \frac{1}{4} N.$ for nearly eighty-three miles, carrying not less than twenty-five fathoms after leaving the shoals. This course leads directly for Montauk Point Light-house. When within eight miles and three-quarters of the light, in twenty-seven fathoms, with the western end of Block Island bearing $NE.$ by $N. \frac{1}{2} N.$ and Block Island Southeast Light-house $NE. \frac{1}{2} E.$, seven miles and five-eighths distant, steer $NW. \frac{3}{4} W.$ Westerly, which course will lead, with not less than seven fathoms, into The Race. When in The Race, with Race Rock Light-house bearing $NE.$ by $E. \frac{1}{2} E.$, Little Gull Island Light-house $SW.$ by $W. \frac{1}{4} W.$, and New London Light-house $N. \frac{3}{4} E.$, you will have thirty-three fathoms and must steer $W.$ through the Main Channel of Long Island Sound, following the directions for that channel on page 384.

The above courses pass two miles and a half to the southwestward of Southwest Ledge; two miles and a quarter to the northeastward of Great Eastern Rock; a mile to the northward of the northern end of Phelps' Ledge; two miles and three-quarters to the northeastward of Washington Shoal; nearly two miles to the northeastward of the black nun-buoy on Shagwong Reef; a quarter of a mile to the southward of Cerberus Shoal; three-quarters of a mile to the southward of the striped nun-buoy on Valiant Rock; and a mile to the northeastward of the black nun-buoy on Little Gull Island Reef.

On the above courses, to enter Napeague Bay.—On the course $NW. \frac{3}{4} W.$ Westerly through Block Island Sound, when Montauk Point Light-house bears $S.$ by $E. \frac{1}{4} E.$, distant nearly five miles, and Chocomount (on Fisher's Island) $N.$ by $W.$, distant eight miles and three-eighths, you will have seventeen fathoms, soft bottom, and $SW. \frac{3}{4} W.$ will lead, with not less than eight fathoms, into the bay, and with not less than three and a half fathoms to the entrance to Napeague Harbor. Anchorage and shelter may be found either on the southern shore of the bay (under Long Island) or on its western shore, (under Gardiner's Island,) according as the wind is to the southward or westward. There is no shelter from easterly winds except in Napeague Harbor or in the narrow passage between Long Island and Ram Island, and neither of these can be entered by strangers.

Sailing Direc- The above course into Napeague Bay passes five-eighths of a mile to the northward
tions—**Long** of Shagwong Reef and a mile and a quarter to the northwestward of Culloden Point.
Island Sound. **To enter Fort Pond Bay.**—On the **SW. $\frac{3}{4}$ W.** course for Napeague Bay, when

Culloden Point bears **S.**, distant a mile and a half, and Gardiner's Island Light-house **NW.** by **W. $\frac{1}{2}$ W.**, distant eight miles and a half, you will have eleven fathoms, and **S. by W.** will lead safely into the bay and up to the anchorage with not less than six fathoms,—passing five hundred yards to the westward of Culloden Point. This bay affords excellent anchorage in muddy bottom, and good shelter from easterly or southerly winds.

On the above courses, to enter Gardiner's Bay.—On the **NW. $\frac{3}{4}$ W.** Westerly course through Block Island Sound, when Montauk Point Light-house bears **S. $\frac{1}{4}$ W.**, distant three miles and three-quarters, and Chocomount (on Fisher's Island) **N. by W. $\frac{5}{8}$ W.**, distant nine miles and three-quarters, you will have about eleven fathoms and must steer **WNW.**, carrying not less than twelve fathoms, until Little Gull Island Light-house bears **NW. $\frac{1}{8}$ N.**, distant four miles and a quarter, and Gardiner's Island Light-house **W. $\frac{1}{4}$ S.** Southerly, distant five miles and a quarter. Here you will have thirteen fathoms and must steer **W. $\frac{1}{4}$ N.**, carrying not less than nine fathoms, to the entrance to the bay. On this course, when Gardiner's Island Light-house bears **SE. $\frac{3}{4}$ E.**, about a mile distant, and Plum Island Light-house **NW. $\frac{1}{4}$ W.**, two miles and a half distant, steer **SW. $\frac{1}{8}$ W.** into the bay and follow the directions for Sag Harbor or Greenport.

The above courses pass a mile and a half to the northward of the black nun-buoy on Shagwong Reef; more than a mile and a quarter to the southward of Cerberus Shoal; more than three-quarters of a mile to the southward of the striped buoy south of Constellation Rock; more than a mile and a half to the southward of Bedford Reef; half a mile to the northward of Gardiner's Point; and a mile and a half to the southward of the red spar-buoy on the rock awash on the southern side of Plum Island.

2. Having come clear outside of Nantucket Shoals.—From the point of departure, between seven and eight miles to the southward of Asia Rip, (Davis' South Shoal Light-vessel bearing **NW. $\frac{1}{4}$ W.**, distant twenty-eight miles, and Sankaty Head Light-house **NW. by N. $\frac{1}{2}$ N.**, distant forty-seven and a half miles,) the course for Montauk Point is **W. by N. $\frac{7}{8}$ N.**, carrying not less than fifteen fathoms until within eight miles and three-quarters of the light-house, with the western end of Block Island bearing **NE. by N. $\frac{3}{4}$ N.** and Block Island Southeast Light-house **NE.**, distant eight and a half miles. Here the depth will be twenty-eight fathoms and **NW. $\frac{5}{8}$ W.** will lead, with not less than seven fathoms, up to The Race. When in The Race, in thirty-three fathoms, with Little Gull Island Light-house bearing **SW. by W. $\frac{1}{4}$ W.**, distant about a mile, and New London Light-house **N. $\frac{3}{4}$ E.**, distant five miles and three-quarters, as before, steer **W.** and follow the directions given for Long Island Sound, on page 384.

The above courses pass three miles and a half to the southwestward of Southwest Ledge; four miles and a quarter to the northeastward of Montauk Shoal; a little over a mile and a half to the northeastward of Great Eastern Rock; about two miles and a quarter to the northeastward of Washington Shoal; a mile and a half to the northeastward of the black nun-buoy on Shagwong Reef; half a mile to the southward of Cerberus Shoal; seven-eighths of a mile to the southward of Valiant Rock; and nearly a mile to the northeastward of the black nun-buoy on Little Gull Island Reef.

On the above courses, to enter Napeague Bay.—On the course **NW. $\frac{5}{8}$ W.** through Block Island Sound, when Montauk Point Light-house bears **S. by E. $\frac{3}{4}$ E.**, distant about four miles and three-quarters, and Chocomount (on Fisher's Island) **N. $\frac{3}{4}$ W.**, distant eight miles and five-eighths, you will have sixteen fathoms and **SW. $\frac{3}{4}$ W.** will lead, with not less than seven fathoms, into the bay, and with not less than three and three-quarter fathoms to the entrance to Napeague Harbor. Good anchorage is found in this bay, and shelter in southerly winds under the northern shore of Long Island, and in westerly and northwesterly winds under the eastern shores of Gardiner's and Ram islands. There is no shelter from easterly winds except in Napeague Harbor or in the passage between Ram Island and Long Island,—neither of which can be entered by strangers.

The above course passes five-eighths of a mile to the northward of the northern extremity of Shagwong Reef, and a mile and a quarter to the northward of Culloden Point.

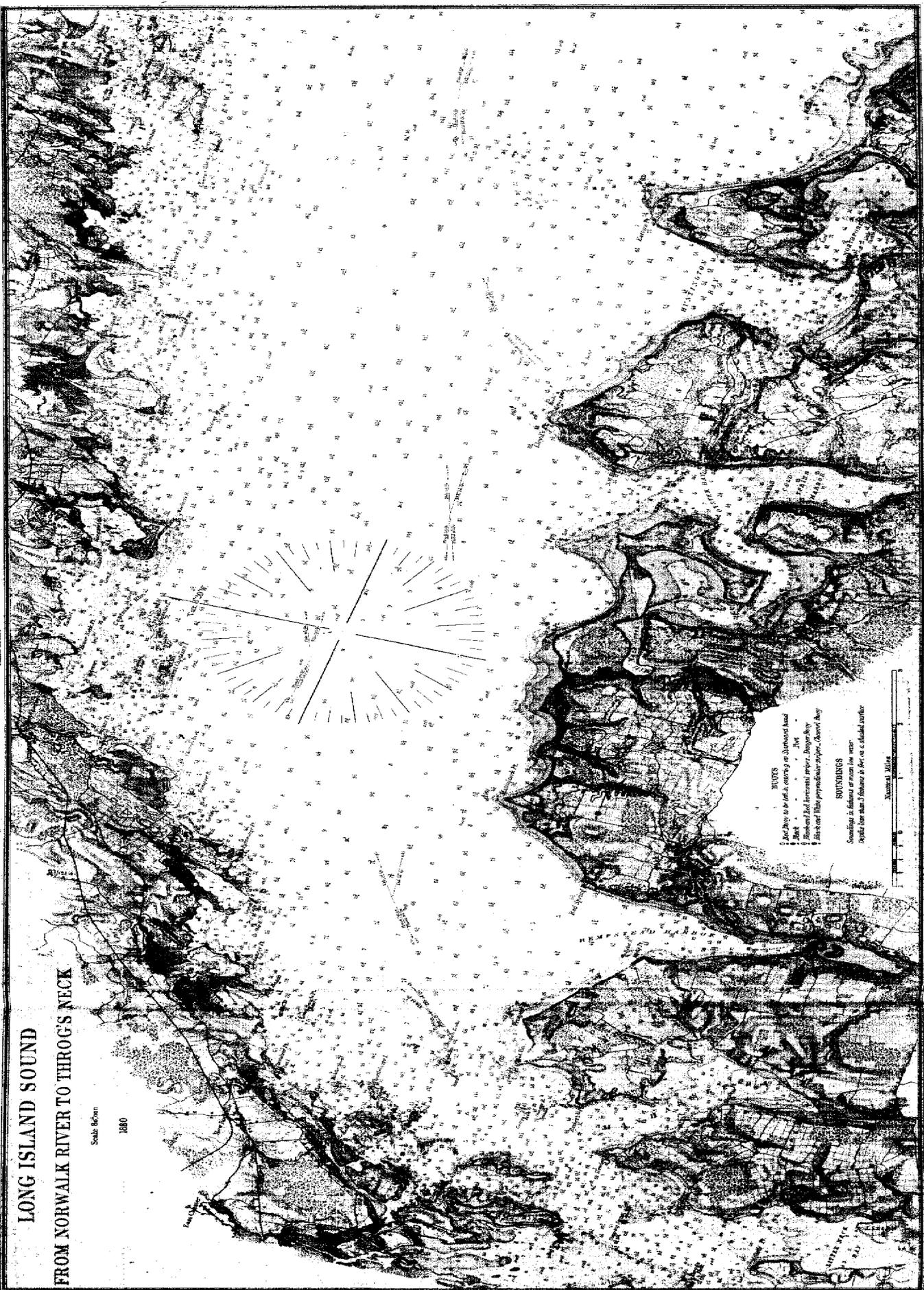
To enter Fort Pond Bay.—Vessels wishing to enter this bay for an anchorage must follow the directions given above.

LONG ISLAND SOUND

FROM NORWALK RIVER TO THROG'S NECK

Scale: Before

1880



BUOYS
Red buoy to be left in company on Starboard hand
Black buoy to be left in company on Port hand
Black buoy to be left in company on Port hand
Black buoy to be left in company on Port hand
Black buoy to be left in company on Port hand

SOUNDINGS
Soundings in fathoms or more the meter
Soundings less than 2 fathoms in feet or in shallow water

Nautical Mile

To enter Gardiner's Bay.—On the **NW. $\frac{5}{8}$ W.** course through Block Island Sound, *Sailing Directions*—**Long Island Sound.** when Montauk Point Light-house bears **S. by E. $\frac{3}{4}$ E.**, distant nearly five miles, and Chocomount (on Fisher's Island) **N. $\frac{3}{4}$ W.**, distant eight miles and five-eighths, as before, steer **W NW.**, carrying not less than twelve fathoms, until Little Gull Island Light-house bears **NW. $\frac{1}{8}$ N.**, distant four miles and a quarter, and Gardiner's Island Light-house **W. $\frac{1}{4}$ S. Southerly**, distant five miles and a quarter. Here you will have thirteen fathoms and must steer **W. $\frac{1}{4}$ N.**, carrying not less than nine fathoms, to the entrance to the bay. When Gardiner's Island Light-house bears **SE. $\frac{3}{4}$ E.**, distant nearly a mile, and Plum Island Light-house **NW. $\frac{1}{4}$ W.**, distant two miles and a half, steer **SW. $\frac{1}{8}$ W.** and follow the directions given for the bay and its harbors.

The above courses pass a mile and a half to the northward of the black nun-buoy on Shagwong Reef; more than a mile and a quarter to the southward of Cerberus Shoal; more than three-quarters of a mile to the southward of the striped buoy south of Constellation Rock; a mile and five-eighths to the southward of Bedford Reef; half a mile to the northward of Gardiner's Point; and more than a mile and a half to the southward of the rock awash on the southern side of Plum Island.

3. But, falling close in with the southern end of Block Island, bring Block Island Southeast Light-house to bear **NE. by N. $\frac{3}{4}$ N.**, distant a mile and seven-eighths, and Montauk Point Light-house **W. $\frac{1}{4}$ S. Southerly**, distant thirteen miles and a half, when you will have twelve fathoms and **W NW.** will lead, with not less than seven fathoms, into The Race; after which the directions for Long Island Sound must be followed.

The above course passes five-eighths of a mile to the northward of the northern end of Southwest Ledge; more than a mile and an eighth to the northward of the striped buoy on Cerberus Shoal; nearly three-quarters of a mile to the southward of Valiant Rock; and nearly a mile to the northeastward of the black buoy on Little Gull Island Reef.

On the above course, to enter Napeague Bay.—On the **W NW.** course for The Race, when in twenty-two fathoms, with Chocomount bearing **NW. by N. $\frac{1}{2}$ N.**, distant seven miles and five-eighths, and Montauk Point Light-house **S. $\frac{1}{4}$ W. Westerly**, distant six and a quarter miles, steer **SW. $\frac{3}{4}$ W.**, which will lead, with not less than seven fathoms, into the bay, and with not less than three and three quarter fathoms to the entrance to Napeague Harbor, passing more than half a mile to the northward of the northern extremity of Shagwong Reef and nearly three miles to the southward of Cerberus Shoal.

To enter Gardiner's Bay.—On the **W NW.** course for The Race, when to the westward of Cerberus Shoal and Race Rock Light-house bears **NW. by N. $\frac{1}{4}$ N.**, distant three miles and an eighth, and Little Gull Island Light-house **W. by N. Northerly**, distant four miles and five-eighths, you will have sixteen fathoms and must steer **W. by S. $\frac{1}{4}$ S.**, carrying not less than eight fathoms, to the entrance to the bay. When Gardiner's Island Light-house bears **SE. $\frac{3}{4}$ E.**, about a mile distant, and Plum Island Light-house **NW. $\frac{1}{4}$ W.**, two miles and a half distant, steer **SW. $\frac{1}{8}$ W.** and follow the directions given for the bay and its tributaries.

The above courses pass an eighth of a mile to the southward of the striped buoy south of Constellation Rock; a mile and a quarter to the southward of Bedford Reef; five-eighths of a mile to the northward of Gardiner's Point; and about a mile and a half to the southward of the red spar-buoy on the rock awash on the southern side of Plum Island.

4. To enter Block Island Sound from the Southwestward by the Montauk Channel and pass through into Long Island Sound.—This channel is not recommended to strangers, nor is it often used by coasters except in easterly gales, when they wish to seek shelter in Fort Pond Bay or under Gardiner's Island. It may, however, be entered without difficulty by bringing Montauk Point Light-house to bear **N. by E. $\frac{1}{2}$ E.**, distant nearly four miles, and steering **NE. by N. $\frac{1}{2}$ N.**, carrying not less than eleven fathoms, until the light-house is exactly abeam,—bearing **NW. by W. $\frac{1}{2}$ W.** and about three-quarters of a mile off. Now steer **N. by W. $\frac{1}{2}$ W.**, with Chocomount open to the eastward of the course, and carrying not less than four fathoms. On this course, when Montauk Point Light-house bears **S. $\frac{3}{4}$ E.**, distant three miles and three-quarters, and Culloden Point **SW. $\frac{3}{4}$ W.**, five miles distant, you will have eight fathoms and **NW. $\frac{5}{8}$ W.** will lead into The Race. Or, if intending to anchor in Fort Pond Bay or Napeague Bay, steer **W. by N.** for about a mile and a half, or until Chocomount bears **N. $\frac{3}{8}$ W.**, distant nearly nine miles, and Montauk Point Light-house **SE. by S. $\frac{1}{2}$ S.**, distant four miles and five-eighths, when **SW. $\frac{3}{4}$ W.** will lead into Napeague Bay. If seeking shelter from easterly

Sailing Direc- winds, when, on this **SW. $\frac{1}{2}$ W.** course, Culloden Point bears **S.**, distant about a mile
tions---Long and a half, and Gardiner's Island Light-house **NW.** by **W. $\frac{1}{2}$ W.**, eight miles and a half
Island Sound. distant, **S.** by **W.** will lead safely into Fort Pond Bay, where excellent anchorage will
 be found in from six to eight fathoms and good shelter from easterly winds.

Or, seeking shelter under Gardiner's Island, when, on the **N.** by **W. $\frac{1}{2}$ W.** course into the Sound, Montauk Point Light-house bears **S. $\frac{3}{4}$ E.** and Culloden Point **SW. $\frac{3}{4}$ W.**, as before, steer **NW. $\frac{3}{8}$ W.** for about a mile and a quarter, or until Chocomount bears **N. $\frac{3}{4}$ W.**, distant eight miles and a half, and Montauk Point Light-house **S.** by **E. $\frac{3}{4}$ E.**, distant four miles and five-eighths. Now steer **W NW.**, carrying not less than twelve fathoms, until Little Gull Island Light-house bears **NW. $\frac{1}{2}$ N.**, distant four and a quarter miles, and Gardiner's Island Light-house **W. $\frac{1}{4}$ S.** Southerly, distant five miles and a quarter, when **W. $\frac{1}{4}$ N.** will lead to the entrance to Gardiner's Bay. On this course, when Gardiner's Island Light-house bears **SE. $\frac{3}{4}$ E.**, about a mile distant, steer **S.** by **E. $\frac{3}{4}$ E.**, and anchor under the north spit of Gardiner's Island in from eighteen to twenty-four feet, in what is known as **Bostwick's Bay.** This is excellent shelter and good holding-ground.

The courses through Montauk Channel pass more than half a mile to the westward of Montauk Shoal; exactly half a mile to the eastward of Montauk Point; five-eighths of a mile to the westward of the black buoy on the western side of Great Eastern Rock; a mile and three-eighths to the eastward of the eastern extremity of Washington Shoal; and a mile and five-eighths to the eastward of the black buoy on Shagwong Reef. The courses into Fort Pond Bay pass a mile to the northward and five-eighths of a mile to the northwestward of Shagwong Reef, and a quarter of a mile to the westward of Culloden Point. The courses for Gardiner's Bay pass a mile and a half to the northward of the black buoy on Shagwong Reef; more than a mile and a quarter to the southward of Cerberus Shoal; more than three-quarters of a mile to the southward of the striped buoy south of Constellation Rock; and half a mile to the northward and the same distance to the westward of Gardiner's Point.

HARBORS IN LONG ISLAND SOUND.

Although there are a great number of harbors and anchorages on both shores of this Sound, there are but few that can be entered by strangers. Several of the most important to the coastwise trade are what is called "tidal" harbors; that is, those whose channels are not navigable (except by small vessels) until the tide is up. Others have narrow, intricate and much obstructed channels, rendering the assistance of a pilot necessary in order to enter them with safety; and many cannot be entered at all except by vessels of very light draught. Only the principal harbors will be described in this place;—sailing directions for the different anchorages on both shores having been already given on pages 387-389 and 399-402.

NEW LONDON HARBOR.

This, the easternmost harbor in Long Island Sound, lies on the northern shore, at the western entrance to Fisher's Island Sound; and is formed by the southern portion of the Thames River, from New London to its mouth. This river is formed by the junction of the **Quinnebaug**, **Shetucket** and **Yantic** rivers at Norwich; whence it flows nearly **S.** for fifteen miles to its mouth and is navigable for almost the whole of this distance. Strangers, however, should not attempt to pass above New London without a pilot.

The entrance to New London Harbor is between Avery's Point on the east and Light-house Point on the west,—these two being the eastern and western points of entrance to the Thames River and distant a little over a mile from each other.

Avery's Point, when seen from the southward, will appear low, grassy, nearly level and under cultivation, and has several houses on it.

Light-house Point is low, rocky, and backed by low thick woods. The distinguishing mark of the point, however, is the white light-tower which is the guide to the harbor, and is known as **New London Light-house.** The tower is eighty-five feet high, attached to a grey dwelling-house, and shows a fixed white light, of the fourth order, from a height of ninety feet above the sea, visible fifteen miles. Its geographical position is

Latitude ----- **41° 18' 58" N.**
Longitude ----- **72° 5' 24" W.,**

and it bears from

	Miles.
Race Rock Light-house, N. by W. $\frac{1}{2}$ W. -----	4 $\frac{1}{2}$
Little Gull Island Light-house, N. by E. $\frac{1}{4}$ E. -----	6 $\frac{1}{2}$
Bartlett's Reef Light-vessel, NE. $\frac{1}{4}$ N. -----	about 3 $\frac{1}{2}$
North Hammock Light-house, (in Fisher's Island Sound,) NW. $\frac{1}{2}$ W. -----	3 $\frac{1}{2}$

A third-class fog-trumpet, giving blasts of six seconds at intervals of fourteen seconds, is placed close to the light-house. On the northern side of Avery's Point (on the eastern bank of the river) makes in a small shallow cove,—the northern point of which is called **Eastern Point.** It is low, rocky, nearly level, covered with grass, and has several houses close to the

shore-line. A little way back from the point is a thick growth of low bushy trees; and to the northward the land rises with a gentle slope to higher wooded country in the background.

Between three and four hundred yards to the northward of Eastern Point is Latham's Chair, a smooth grassy hillock, under cultivation; and in front of which is an islet, (called **Hob's Island**,) composed of steep bare rocks, forming the southern arm of the Chair; while the northern arm is formed by a long rocky point, with perpendicular palisaded faces, about a hundred yards to the northward of the island. About an eighth of a mile to the northward of **Latham's Chair**, this point will be seen a large hotel with mansard roof, and several smaller houses in its vicinity. There are also a few ornamental trees. The hotel is called the **Ocean House** and is a mile and three-quarters below the village of Groton. To the northward of the hotel the eastern shores appear as smooth gently sloping lands, well cultivated and thickly settled,—the cleared fields being separated by groves of ornamental trees. The shore is faced with rocks. Above **Avery's**, which is about five-eighths of a mile to the northward of the Ocean House, the land begins to rise and so continues to the hills back of Groton, upon which is situated **Fort Griswold**. Upon the highest summit, just clear of the northern angle of Fort Griswold and about four hundred yards back from the shore-line, stands a very tall monument,—the most **Groton Monument**, prominent landmark seen in approaching New London Harbor from the Sound. This is the Groton Monument and stands upon the site of the **Old Fort Griswold**, celebrated in revolutionary annals. The village of **Groton** stretches along the shore at the base of the steep hill upon which the fort is built. It is directly opposite to the city of New London.

On the western bank of the river, about three hundred yards above the light-house, lie the **Quinnepeag Rocks**,—a group of rocky islets about a hundred and fifty yards from shore, with a few bushes and some grass upon them; and about four hundred yards above these rocks, three-eighths of a mile to the northward of the light-house, and directly opposite to the Ocean House, (on the eastern bank,) will be seen a very large hotel on a smooth grassy point, called **Pequot Point**, extending to the eastward into a rocky head on which is a small pavilion. Here there is a wharf and **Pequot Point**, steamboat landing; and here begins the village of **Pequot**, which extends along the western bank to **Fort Trumbull**. From **Pequot Point** the shore is faced by a long beach, called **White Beach**, which extends to **Green's Harbor** on the southern side of **Fort Point**. **Pequot** presents a beautiful appearance from the river,—being composed almost entirely of handsome villas surrounded by ornamental grounds dotted with trees.

Green's Harbor is the name given to the cove or bight on the western shore formed by the projection of the neck of land upon which **Fort Trumbull** is built and the trend of the shore to the northwestward from **Pequot Point**. It affords anchorage in from six to ten feet for small vessels and is very frequently used. Its shores, (which are mostly occupied by the village of **Pequot**,) though low, have perpendicular faces and a gently sloping surface, covered with **Green's Harbor**, handsome houses standing among groves of ornamental trees. Its northern shore, which is formed by the neck of land above mentioned, is also low, slightly undulating, cleared and settled. To the eastward it extends to a smooth, round, grassy point with a gentle slope and terminating in a rocky bluff. This is **Fort Point**, and on its summit stands a granite work called **Fort Trumbull**.

Close in with the northern shore of **Green's Harbor** lies a small bare island called **Goose Island**; and about one hundred and fifty yards to the southeastward of this is a low rocky islet covered with grass and bushes and called **Powder Island**.

On the northern side of the neck of land on which **Fort Trumbull** is built a large cove of very irregular shape makes in to the westward,—its northern shore being occupied by the city of New London. It is crossed about four hundred yards above its mouth by a bridge carrying the New Haven and New London Railroad. Its shores **Coit's Cove**, are all low, gently sloping and thickly settled,—the houses standing in clusters amid beautifully cultivated fields and forming the southern suburbs of the city. This cove is called **Coit's Cove**, and affords anchorage to the eastward of the bridge in from seven to eleven feet water.

The city of **New London** occupies the neck of land separating **Coit's Cove** from **Winthrop's Cove**, which latter runs along the northeastern face of the city. It has a general direction about **NW.** for half a mile, is quite narrow,—being only two hundred yards wide at its mouth and gradually diminishing towards its head,—and about **Winthrop's Cove**, three hundred yards above its mouth is crossed by a bridge carrying the New London Northern Railroad. There is from ten to eighteen feet in its channel below the bridge, but it is not used as an anchorage, in order to keep the way clear for vessels going alongside the wharves.

On the northern side of the entrance to **Winthrop's Cove** is a comparatively low point, with slightly undulating surface and steep faces to the eastward, called **Winthrop's Point**. It is bare of trees and is for the most part occupied by houses. Here the river is only about four hundred yards wide and above this strangers do not go.

Above **Winthrop's Point** the **Thames River** has a general course about **N. $\frac{1}{2}$ E.** for four miles and a quarter to **Horton's Point**, and its width throughout this distance varies from about four hundred yards to half a mile. Its shores are for the most part high though very gently sloping, and are diversified with woods and cleared and settled lands. The high land on the eastern bank, above **Groton**, is called **Starr's Hill**, and is almost entirely under cultivation. Opposite **Starr's Hill**, to it, on the western bank, is **Young's Hill**,—a wooded hill with outcropping ledges on its eastern slopes, about five-eighths of a mile above **Winthrop's Point**. It is also sometimes called **Bolles' Hill**. It is joined on the north to **Quaker Hill**,—a smooth, gently sloping, grassy hill, whose summit is directly opposite to that of **Starr's Hill**. **Quaker Hill** is almost entirely under cultivation and its slopes dotted with houses.

About a mile and a half above Winthrop's Point a small shallow cove makes into the western shore between level, cultivated, grassy land (at the northern base of Quaker Hill) on the south, and a steep rocky head on the north, projecting from the western bank into the river, whose width it diminishes to a quarter of a mile. The slopes of this head are covered with outcropping ledges, and, though bold in its appearance, it is surrounded by shoals and must not be approached closely,—the channel keeping the eastern bank with not less than four and a half fathoms. This hill is called Mamicoek Hill, and the cove Mamicoek Cove. On its northern side makes in Smith's Cove with about four feet at low water, but which is crossed and closed, about six hundred yards above its mouth, by a bridge carrying the New London Northern Railroad.

Opposite to Mamicoek Hill, and separated from Starr's Hill on the south by a small stream running through marshy lands, is Rocky Hill, partly wooded and partly grassy, somewhat steep, and over one hundred feet high. It descends towards the river to low level land with somewhat steep faces, varying in height from ten to twenty feet; and this level land continues from abreast of Mamicoek Hill to Cow Point, seven-eighths of a mile above, and is now occupied by the United States as a Naval Station.

Cow Point is easily recognized by the steep rocky hill about eighty feet high rising from the low level lands surrounding it. This point is a little over three miles above Winthrop's Point, and here the river is only a little over four hundred yards wide with a depth of from three to six fathoms in the channel. The hill on Cow Point is thinly wooded and has many outcropping ledges on its western slopes. To the northward it descends to low level land, mostly wooded, but with one or two clearings here and there; and then the shore turns abruptly to the eastward, forming Long Cove—a narrow and shallow cove running about E SE. and crossed at its mouth by a bridge. Four feet at low water can be taken across the flats up to this bridge.

From Long Cove to Gale's Ferry, about seven-eighths of a mile above, the general trend of the eastern bank is about N. It is diversified with low level lands, showing steep faces towards the river, and by hills with wooded summits rising somewhat abruptly from the low land close to the bank. At Gale's Ferry, however, the land is lower—being not over forty feet high—with a nearly level surface, cleared, cultivated and settled. There is a settlement here, which has grown up around the ferry connecting the two banks of the river.

The western bank of the river, from Smith's Cove to Horton's Point, is composed of gently sloping hilly land, varying from twenty to a hundred and fifty feet in height and diversified with woods, grass land and cultivated fields. Browning's Hill, about a mile above Smith's Cove, is the highest land on this side and has a level cleared summit under cultivation. To the northward it descends with a very gentle slope to low level lands about twenty feet high, bare of trees, cultivated and dotted with houses; and these extend to Horton's Point, which is just above Gale's Ferry and about two miles above Smith's Cove. The ferry-landing is an eighth of a mile below this point, and here there is one long wharf and several smaller ones and the shore is thickly dotted with houses.

Horton's Point is a long, low, flat point, terminating in a large wharf with store-house and several other houses upon it. Behind it the land rises somewhat abruptly to a height of twenty feet and then continues nearly level to Uncasville, a small settlement about three-eighths of a mile inland. Almost directly opposite to the point, on the eastern bank of the river, is Clarke's Cove, a small shallow cove making in on the northern side of Gale's Ferry, between it and the steep rocky Mount Decatur on the north. Only two feet at low water can be taken into this cove.

Mount Decatur is a steep rocky hill, about one hundred and fifty feet high, partly wooded, and showing many bare outcropping ledges. Between Horton's Point and the base of this hill the river is but little over four hundred yards wide; and here it apparently divides, sending one branch to the northwestward and another to the northeastward, with a large neck of land, partly wooded and partly cleared, between them. The branch which runs to the northwestward is known as Horton's Cove and heads in a small stream about a mile above its mouth. It is crossed at its mouth by a draw-bridge, through which about three and a half feet at low water can be taken into the cove. The high wooded hill seen to the westward of this cove is Mount Horton.

The branch running to the northeastward is the river proper, which from this point has a general course about NE. by N. for about two miles to Paquatannock Point. The neck of land between the two branches is known as Napeague Neck, and rises with a very gentle slope to a nearly level summit about eighty feet high, and which is for the most part under cultivation. Houses dot the slopes and summit and there are occasional groves of trees. Between the southern end of this neck and Mount Decatur the river is only about two hundred and seventy-five yards wide with a depth in the channel of from three to five and a half fathoms. Hence it takes its course between hilly undulating banks varying in height from twenty to two hundred feet, diversified with woods and cleared fields and dotted with houses, to the mouth of Paquatannock Cove.

The entrance to Paquatannock Cove is marked by a steep wooded hill on its southern side called Paquatannock Hill. It is about two hundred feet high. A draw-bridge crosses the mouth of the cove from the northern base of this hill to Paquatannock Point, and six and a half feet at low water can be taken through it. The cove has a somewhat winding course, running first about NE. by N. for about five-eighths of a mile; then about NNE. for a little over half a mile; and then nearly due E., for the same distance, to the village of Paquatannock. About nine hundred yards above its mouth it is crossed by a second bridge,—above which there is no navigation except for small



Page 1

George P.

Rowl Owen House

Green Mountain

New London J.C.B.

Entrance to New London Harbor from the Southwest, New London J.C.B. bearing N. 1/2 E. distant 38 Miles

boats. Only three feet at low water can be taken up to this second bridge. A small marsh islet lies nearly in the middle of the mouth of the cove,—the draw-bridge crossing its eastern end;—and another small islet, only about twenty yards wide and a little over one hundred and fifty yards long, lies in the river about two hundred yards to the westward of Paquatannock Point. It is called **Walden's Island** and lies nearly **N. by E.** and **S. by W.**,—the channel passing to the westward of it.

At Paquatannock Point the river turns and runs nearly due **N.** to Thamesville, two miles and a half above. The point itself is low and nearly level, thinly wooded, and has a few houses near its southern end. Opposite to it, on the western bank, are the **Mohican Hills**, which present alternate steep and gentle slopes, diversified with woods and cleared fields and dotted with houses. The highest summit, that of **Uncas Hill**, is about three hundred and forty feet above the river. **Paquatannock Point.**

The shores of the river between Paquatannock Point and Thamesville are hilly; but the eastern bank is neither so high nor so steep as the western shore. For about a mile and a half above the point this eastern bank presents a slightly undulating appearance,—the land rising somewhat abruptly in some places and in others with a very gentle slope; but in no place more than fifty or sixty feet high. Woods and cleared fields alternate and there are many houses. The western bank, on the contrary, is steep and for the most part wooded; and the land rises to a height of over two hundred feet,—forming what is known as **Indian Hill**. On the north this hill descends somewhat less abruptly to a wide but shallow cove, known as **Trading Cove**, which is a little less than a mile below Thamesville. This cove is about an eighth of a mile wide at its mouth, where it is crossed by a bridge. It is of no importance.

Above Trading Cove both banks are steep; but the eastern bank is the steeper and higher of the two. Teft's Point, the northern point of entrance to the cove, is a thickly wooded point rising to a height of about ninety feet, which it attains about three hundred and fifty yards back from the river. The river is here but little over three hundred yards wide, with a narrow channel good for not more than nine feet at low water. The eastern bank is quite steep and wooded and attains a height of about one hundred and eighty feet, which height it keeps, with scarcely an exception, to the head of the river. The summit of the ridge is for the most part cleared and settled; but there are occasional groves of trees. **Teft's Point.**

Thamesville is a small settlement on the western bank of the river about half a mile below its head and forms a suburb of the city of Norwich. On the eastern bank is the village of **Laurel Hill**, another suburb, which extends to the mouth of the Shetucket. The city of **Norwich** occupies the peninsula between the Shetucket and Yantic rivers and is connected with Thamesville and Laurel Hill by bridges. The bridge over the Yantic crosses an island about four hundred yards long, which lies in the middle of the mouth of that river and is covered with houses.

Norwich has a population of about fifteen thousand and considerable manufacturing interest. New London has about eleven thousand, and, besides manufactures, has considerable coastwise trade and some interest in the whale fishery.

DANGERS

IN APPROACHING AND ENTERING NEW LONDON HARBOR.

I. From the Eastward by the Main Channel.—There are two channels into New London Harbor, viz: The **Main Channel**, entering from Long Island or Block Island Sound, and the **Pine Island Channel**, entering from Fisher's Island Sound. The latter is not recommended to strangers.

Vessels from the eastward, bound into New London by the Main Channel, are accustomed to bring New London Light-house to bear **N. by W.** and steer for it, passing through The Race. On this course there will soon be seen well to the westward, bearing about **NW. by W. ½ W.** and a mile and a quarter distant, a nun-buoy* painted red and black in horizontal stripes. This is on **Valiant Rock**, which lies nearly midway between Race Point and Little Gull Island and has seventeen feet upon it at low tide. It is a small detached rock with from five to thirteen fathoms on all sides of it, and the marks for it are as follows: Morgan's Point Light-house **Valiant Rock.** (Mystic River) just open to the northward of North Hill (on Fisher's Island) and bearing about **NE. ½ N.**; New London Light-house on with the gap in Bolles' Hill (north of New London, see page 409) and bearing nearly due **N.**; Little Gull Island Light-house open a little to the southward of Great Gull Island on a bearing of **SW. by W. ¾ W.**; and the southern point of Fisher's Island (abreast of Prospect Hill) in range with the southeastern or most distant point of the island. These marks are given on account of the velocity of the tidal current in The Race, which is so great that it is difficult to keep the buoy in position. Navigators should, therefore, rely more upon these marks than upon the position of the buoy at any time.

When correctly in position the buoy is close to the rock, on its western side, and bears from

	Miles.
Race Rock Light-house, SW. ⅝ W.	1 ½
Cerberus Shoal buoy, NW. ½ W.	6
Buoy on Block Island North Reef, W. ½ N.	22 ¾
Montauk Point Light-house, NW. ¾ N.	13 ¼
Little Gull Island Light-house, NE. by E. ¾ E.	2
Gardiner's Island Light-house, NE. ¼ N. Nearly	6

From this buoy Bartlett's Reef Light-vessel bears **NW. $\frac{1}{2}$ N.**, three miles and three-quarters, and New London Light-house **N.**, five miles and a half distant.

When abreast of Valiant Rock the light-house on **Race Rock** will be seen bearing about **N.** by **E. $\frac{1}{4}$ E.** and three-quarters of a mile off. It shows a revolving light (flashing alternately red and white at intervals of thirty seconds) of the fourth order. (See also page 346.) When **Sarah's Ledge** past it the course continues to the northward, and there are no dangers until you are within a mile and a half of New London Light-house, when a spar-buoy painted red and black in horizontal stripes will be seen to the westward, bearing about **WNW.** and five-eighths of a mile off. This is on Sarah's Ledge, (sometimes called *Mercer's Rock*), a detached ledge, with fourteen feet at low tide, lying about a mile **W.** by **S. $\frac{3}{4}$ S.** from Goshen Point. The buoy is on the western side of the ledge, in three fathoms water, and bears from

	Miles.
North Hammock Light-house, W. by N. $\frac{1}{2}$ N. -----	3 $\frac{1}{4}$
Race Rock Light-house, NW. by N. $\frac{1}{8}$ N. -----	3 $\frac{1}{4}$
Valiant Rock, N. $\frac{1}{2}$ W. Nearly-----	4 $\frac{1}{2}$
Little Gull Island Light-house, N. by E. $\frac{1}{2}$ E. -----	5 $\frac{1}{2}$
Bartlett's Reef Light-vessel, NE. $\frac{3}{4}$ E. -----	2 $\frac{1}{2}$
Buoy on Rapid Rock, NE. $\frac{3}{4}$ E. ----- a little over	2 $\frac{1}{2}$

From this buoy

	Miles.
Cormorant Rock buoy bears NW. $\frac{3}{4}$ N. -----	1 $\frac{1}{2}$
New London Light-house N. by E. Easterly -----	1 $\frac{1}{4}$
Frank's Ledge buoy NE. ----- nearly	1 $\frac{1}{4}$
Southwest Ledge buoy NE. by E. $\frac{1}{8}$ E. -----	1 $\frac{1}{2}$
Red buoy south of Black Ledge E. by N. $\frac{1}{2}$ N. ----- a little over	1

To avoid Sarah's Ledge do not stand to the westward of New London Light-house bearing **N.**

In beating into New London Harbor you must not, while to the southward of Sarah's Ledge, stand farther to the westward than to bring New London Light-house to bear **N.** by **E. $\frac{3}{4}$ E.**, by which means you will avoid Goshen Reef and Rapid Rock,—both of which are buoyed.

Goshen Reef, which has from seven to ten feet upon it, lies **SE.** by **S. $\frac{1}{2}$ S.** from Goshen Point,—its northern end being about three-eighths of a mile from that point. From this northern end it extends in a **SSE.** direction for a quarter of a mile; and here is placed a black spar-buoy (No. 3) in thirteen feet water. From this buoy shoal water (not more than seventeen feet) extends to the south-eastward for about three hundred and fifty yards to Rapid Rock, which has ten feet at low tide and is marked by a spar-buoy, painted red and black in horizontal stripes, placed in twelve feet close to the rock on its southeastern side. This buoy bears from

	Miles.
Race Rock Light-house, NW. by N. -----	3 $\frac{1}{2}$
Valiant Rock, N. by W. $\frac{1}{4}$ W. -----	4
Little Gull Island Light-house, N. by E. Easterly ----- nearly	4 $\frac{1}{2}$
Bartlett's Reef Light-vessel, NE. $\frac{3}{4}$ E. -----	1 $\frac{1}{2}$

From this buoy

The black buoy on Goshen Reef bears N. by W. $\frac{1}{2}$ W. -----	350 yds.
Goshen Point NW. by N. $\frac{3}{4}$ N. ----- nearly	1 $\frac{1}{2}$ mile.
New London Light-house NE. by N. $\frac{3}{4}$ N. -----	1 miles.
The black buoy on Cormorant Rock NE. by N. $\frac{1}{2}$ N. -----	"
The striped buoy on Sarah's Ledge NE. $\frac{3}{4}$ E. ----- a little over	"

When to the northward of Sarah's Ledge vessels must not stand farther to the westward than to bring New London Light-house to bear **N.** by **E. $\frac{3}{4}$ E.** to avoid Cormorant Rock, or *Cormorant Rock Ledge*, as the shoal should properly be called. Cormorant Rock is a small bare rock from twenty to

Cormorant Rock. thirty yards in diameter, which lies about half a mile **E. $\frac{1}{4}$ S.** from Goshen Point and four hundred yards from the nearest shore. It is surrounded by shoals and there is no safe passage to the westward of it. The ledge lies about two hundred yards to the eastward of the bare rock, has eight feet at low water, and is marked by a black spar-buoy (No. 5) placed in fifteen feet on its eastern side,—New London Light-house bearing **NE.** by **N. $\frac{3}{4}$ N.**, distant about a mile; the striped buoy on Sarah's Ledge **SE. $\frac{3}{4}$ S.**, three-eighths of a mile; and Rapid Rock buoy **SW.** by **S. $\frac{1}{2}$ S.**, distant three-quarters of a mile.

About two hundred yards **N.** by **E.** from Cormorant Rock and an eighth of a mile from the nearest shore lies another bare rock, called **Middle Rock**, and about two hundred yards to the north-eastward of this a rocky islet about fifty yards in diameter called **Shore Rock**. All of these are avoided by not going to the westward of New London Light-house bearing **N.** by **E. $\frac{3}{4}$ E.** in range with Groton Monument.

When abreast of the striped buoy on Sarah's Ledge another spar-buoy, painted red and black in horizontal stripes, will be seen to the eastward of the course, bearing about **NE. by N. $\frac{1}{4}$ N.** and half a mile off. This is on Southwest Ledge, a detached shoal, with seven feet at low water, lying nearly in the middle of the entrance, and with from four to five fathoms on all sides of it. The sailing-line passes to the westward of it, and to avoid it, in beating, vessels should not stand to the eastward of the light-house bearing **N NW.** The buoy is placed on the western side of the ledge in two fathoms,—Sarah's Ledge buoy bearing **SW. by W. Westerly**, seven-eighths of a mile; New London Light-house **NW. by N.**, the same distance; and the middle of Pine Island **E. by N. $\frac{3}{4}$ N.**, a little over three-quarters of a mile distant.

Southwest Ledge.

About three-eighths of a mile to the eastward of this buoy will appear a red can-buoy,* and a quarter of a mile to the northeastward of this a stone beacon surmounted by a staff and cage. These are both on Black or Southeast Ledge, an extensive ledge lying nearly **NE. and SW.** and covering an area six hundred yards long and three hundred and fifty wide. The shoalest part of the ledge, which has two feet at low tide, is about a hundred yards to the southward of the beacon, and there is *another rock with three feet* about a hundred yards to the eastward of the buoy. Over the rest of the ledge the soundings vary from six to twelve feet and vessels should, under no circumstances, attempt to pass between the buoy and the beacon. The buoy is placed on the south-western side of the ledge in three fathoms water, and is intended to mark the eastern limits of the Main Channel. It is marked No. 2, and bears from

Black or Southeast Ledge.

Sarah's Ledge buoy, E. by N. $\frac{1}{2}$ N.	1 mile.
Southwest Ledge buoy, SE. by E. $\frac{1}{4}$ E.	600 yds.
New London Light-house, SE. $\frac{1}{2}$ S.	a little over 1 $\frac{1}{8}$ miles.
North Hammock Light-house, NW. by W. $\frac{1}{4}$ W.	nearly 2 $\frac{1}{2}$ "

From this buoy the beacon bears **NE. by E.** Nearly, distant about five hundred yards, (and will be in range with the highest land on the western end of Pine Island;) Black Rock **N. $\frac{1}{4}$ E.**, three-quarters of a mile; and the striped buoy on Frank's Ledge **N. by W. $\frac{1}{4}$ W.**, a little over half a mile distant.

The beacon, which is called **Black Ledge Beacon**, is near the north-western point of the ledge, and is a granite structure surmounted by a spindle and cage,—the latter being in the shape of two cones joined at their small ends,—the whole being painted black. It bears from

	Miles.
New London Light-house, SE. $\frac{5}{8}$ E.	about 1 $\frac{1}{8}$
The middle of Pine Island, SW. by W. $\frac{1}{4}$ W.	about 1 $\frac{3}{8}$
Sea-Flower Reef Beacon, NW. by W. Westerly	a little over 1 $\frac{5}{8}$
North Hammock Light-house, NW. $\frac{3}{4}$ W.	2 $\frac{1}{2}$

From this beacon the buoy on Frank's Ledge bears **NW. $\frac{1}{8}$ W. Westerly**, three-eighths of a mile, and Black Rock **N. by W. $\frac{1}{8}$ W. Westerly**, a little over half a mile distant.

Vessels may pass between Southwest Ledge and Black Ledge by keeping about midway between the buoys on the two ledges and steering for the eastern extremity of Fort Point bearing nearly **N. by W.**

When abreast of Southwest Ledge on the course in by the Main Channel another spar-buoy, painted red and black in horizontal stripes, will be seen to the eastward of the course, bearing about **NE. $\frac{1}{4}$ N.** and half a mile off. This is on Frank's Ledge, a detached ledge, with thirteen feet at low water, lying about half a mile to the westward of Avery's Point. The buoy is on the rock, and bears from

Frank's Ledge.

New London Light-house, SE. by E. Easterly	$\frac{3}{4}$ mile.
The striped buoy on Southwest Ledge, N. by E. $\frac{1}{2}$ E.	between 800 and 900 yds.
Black Ledge Beacon, NW. $\frac{1}{8}$ W. Westerly	$\frac{3}{8}$ mile.

From this buoy Eastern Point bears **N. by E. $\frac{5}{8}$ E.**, eight hundred and fifty yards, and Fort Point **N. by W.**, two miles distant.

The marks for Frank's Ledge, should the buoy be gone, are Groton Monument and the hollow in Hob's Island in range on a bearing of **N. $\frac{1}{2}$ E.**; and the eastern extremity of White Rock just touching the southern end of Powder Island.

If beating to windward vessels should not, when to the northward of Southwest Ledge, stand farther to the westward than to bring New London Light-house to bear **N.**, by which means the shoals lying off the western shore, to the southward of the light-house, will be avoided. Of these the first met with, to the northward of Shore Rock, are *a rock awash and a sunken rock with ten feet water*, lying to the eastward of Long Rock at distances of a hundred and a hundred and twenty-five yards, respectively. Long Rock is a mass of bare rock projecting from the sand beach on the western shore, half a mile to the southward of the light-house and three-eighths of a mile to the northward of Shore Rock. The ten feet rock is the farthest from shore and is easily avoided by following the above direction.

Long Rock.

A little over five hundred yards to the northward of Long Rock, four hundred and fifty yards to the southward of the light-house, and three hundred and fifty from the nearest shore, is a *sunken rock with eleven feet at low water*. From the light-house it bears $S. \frac{3}{4} W.$, and from Black Rock $W. \frac{5}{8} S.$, a little over four hundred yards distant. It is easily avoided by not going to the westward of the light-house bearing $N.$, as before.

To avoid Frank's Ledge, on the eastern side of the channel, do not stand to the eastward of Race Rock Light-house bearing $S. \frac{3}{4} E.$ or the eastern extremity of Fort Point $N. \frac{3}{4} W.$

Black Rock also lies on the eastern side of the channel,—being a little over three hundred yards to the southward of Eastern Point and six hundred yards to the westward of Avery's Point. It is a rocky islet about fifty yards long, lying nearly $NE.$ and $SW.$, and entirely bare. **Black Rock.** Shoal water surrounds it and extends to the southward,—seventeen feet being found six hundred yards to the southward of the rock and the same distance to the south-westward of Avery's Point. This shoal water encroaches upon the limits of the Pine Island Channel and renders it unsafe for vessels of large draught.

When to the northward of the light-house the eastern bank of the river is comparatively steep-to and may be approached, from Eastern Point to above the Ocean House, within one hundred and fifty yards with not less than three and a half fathoms. Vessels drawing over seventeen feet, however, should give this shore, abreast of Avery's, a berth of about three hundred and fifty yards, when they will have not less than four fathoms. Between Avery's and Groton it is safe to go within an eighth of a mile of the shore, and, in some places, nearer; but the lead is the best guide in keeping off both shores, as the water shoals gradually. At Groton the eastern bank is steep-to and you may stand with safety close up to the wharf-line.

On the western side of the channel the shoals off the *Quinnipeag Rocks* are easily avoided by not approaching the shore in their vicinity nearer than three hundred and fifty yards. Green's Harbor must not be approached by large vessels, as it is all shoal. The lead, however, is the best guide for vessels beating through the channel,—the rule being to go about as soon as you strike three fathoms.

In Green's Harbor there are several shoals, only one of which—Melton's Ledge—is buoyed. The southernmost of these shoals is called *The Hog's Back*, and is formed by two rocks, awash at low tide, and surrounded by a *sunken ledge nearly bare at low water*. **The Hog's Back.** It lies a little over four hundred yards from the nearest part of the Pequot shore, a quarter of a mile $S.$ by $E.$ from Goose Island, and about four hundred yards $S.$ by $W.$ from Powder Island.

White Rock, a bare rocky islet about fifty yards long, lies about a hundred yards to the eastward of *The Hog's Back*, and bears from the eastern extremity of Fort Point $S. \frac{1}{2} W.$, about eight hundred yards; from the middle of Powder Island $S. \frac{1}{4} E.$, about three hundred yards; and from the southern end of Goose Island $SE.$ by $S. \frac{1}{4} S.$, about four hundred and fifty yards distant.

Melton's Ledge, which is awash at low water, lies two hundred yards to the eastward of Powder Island. It is similar to *The Hog's Back*,—its summit being awash and the rest of the ledge nearly bare at low tides. It lies nearly $E.$ and $W.$, is about a hundred yards long, and is marked by a black spar-buoy (No. 7) placed in nine feet on its southeastern side. This buoy bears from **Melton's Ledge.** White Rock $NE.$ by $N.$ Nearly, about three hundred and fifty yards; from Groton Monument $SW. \frac{3}{4} S.$, about a mile; and from the eastern extremity of Fort Point $S. \frac{3}{4} E.$, six hundred yards distant. To avoid it, and all of the dangers in the vicinity of Green's Harbor, it is only necessary to go about as soon as the eastern extremity of Winthrop's Point bears $N. \frac{1}{2} E.$ This bearing also clears all the shoals on the western bank from Fort Point nearly up to Winthrop's Point.

Above New London it is not safe to go without a pilot.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING NEW LONDON HARBOR.

I. *From the Eastward by the Main Channel.*—1. *Having come through Black Island Sound.*—Bring Little Gull Island Light-house to bear $W. \frac{1}{4} S.$, distant three miles, New London Light-house $N.$ by $W.$, and Race Rock Light-house $N.$ Easterly, distant a mile and five-eighths, when you will have fourteen fathoms and must steer $N.$ by $W.$ for New London Light-house, carrying not less than eight fathoms, until nearly abreast of the striped buoy on Sarah's Ledge, with Groton Monument bearing $N. \frac{3}{4} E.$ Easterly, North Hammock Light-house $E.$ by $S. \frac{3}{4} S.$, and Bartlett's Reef Light-vessel $SW.$ by $W. \frac{3}{4} W.$ Now steer $N. \frac{1}{4} E.$, which course will lead, with not less than four fathoms, to the anchorage off the city. If bound to Norwich take a pilot at New London.

The above courses pass nearly a mile to the eastward of Valiant Rock; seven hundred yards to the westward of Race Rock; half a mile to the eastward of the striped buoy on Sarah's Ledge; the

same distance to the westward of the red buoy on the southwestern end of Black Ledge; nearly three-quarters of a mile to the eastward of the black buoy on Cormorant Rock Ledge; about four hundred yards to the westward of the striped buoy on Southwest Ledge; six hundred yards to the westward of the striped buoy on Frank's Ledge; three-eighths of a mile to the eastward of the "eleven feet rock" to the southward of Light-house Point; nearly half a mile to the westward of Black Rock; three hundred yards to the eastward of the Quinnepeag Rocks; six hundred yards to the eastward of The Hog's Back; and four hundred yards to the eastward of the black buoy on Melton's Ledge.

Or, with Little Gull Island Light-house bearing SW. by W. $\frac{1}{4}$ W., about a mile distant, and New London Light-house N. $\frac{3}{4}$ E., distant five miles and three-quarters, steer N. by E. $\frac{1}{8}$ E. towards Groton Monument, carrying not less than four and a half fathoms, until New London Light-house bears NW. by W. $\frac{1}{8}$ W., three-eighths of a mile distant, when steer N. $\frac{1}{4}$ E. to the anchorage, as before.

The above courses pass nearly a mile to the westward of Valiant Rock; more than three-quarters of a mile to the eastward of the striped buoy on Rapid Rock; seven-eighths of a mile to the eastward of the black buoy on Goshen Reef; seven hundred yards to the eastward of the striped buoy on Sarah's Ledge; five-eighths of a mile to the eastward of the black buoy on Cormorant Rock Ledge; a little over half a mile to the westward of the red buoy on the southwestern end of Black Ledge; a quarter of a mile to the westward of the striped buoy on Southwest Ledge; and six hundred and fifty yards to the westward of Frank's Ledge.

Or, bring Race Rock Light-house to bear S. $\frac{3}{4}$ E. Easterly and steer N. $\frac{3}{4}$ W. Westerly towards the eastern extremity of Fort Point. This course continued will lead, with not less than three and a half fathoms, safely into the river, passing between Black Ledge and Southwest Ledge. Continue it until just past the Ocean House, with New London Light-house bearing SW. $\frac{5}{8}$ S. and Groton Monument N. by E. $\frac{1}{4}$ E. Now steer N. $\frac{1}{4}$ E. for the eastern extremity of Winthrop's Point and anchor at discretion abreast of the city.

The above courses pass three hundred yards to the westward of the red buoy on the southwestern end of Black Ledge; two hundred yards to the eastward of the striped buoy on Southwest Ledge; and the same distance to the westward of Frank's Ledge.

2. Having come through Gardiner's Bay.—Bring Little Gull Island Light-house to bear N. $\frac{7}{8}$ W., distant a little over two miles, and New London Light-house N. $\frac{7}{8}$ E., distant eight miles and a half; when you will have ten fathoms and N. by E. $\frac{1}{8}$ E. for Groton Monument will lead safely into the river, following the directions given above.

3. Having come through Fisher's Island Sound.—Continue the W. $\frac{3}{4}$ N. course through the Sound, passing to the northward of Sea-Flower Reef Beacon, to the southward of Black Ledge, and carrying not less than five fathoms until New London Light-house bears N. by W., distant a little over a mile and an eighth, and Groton Monument N. $\frac{3}{4}$ E. Easterly, distant three miles and three-eighths. Here the depth will be five and three-quarter fathoms and N. $\frac{1}{4}$ E. will lead safely to the anchorage, as before. (See also Sailing Directions for Fisher's Island Sound, pages 321-322.)

The above course from Fisher's Island Sound passes two hundred and fifty yards to the northward of Sea-Flower Reef Beacon; six hundred yards to the southward of the red buoy on the southwestern end of Black Ledge; and about nine hundred yards to the southward of Southwest Ledge.

DANGERS

IN APPROACHING AND ENTERING NEW LONDON HARBOR.

II. From the Eastward by the Pine Island Channel.—This channel is only used by vessels which have come through Fisher's Island Sound. Such vessels, instead of passing between Sea-Flower Reef and North Hammock and steering for Bartlett's Reef Light-vessel, continue the W. $\frac{3}{4}$ N. course to pass to the northward of Sea-Flower Reef and then steer for New London Light-house. When abreast of North Hammock Light-house, having it bearing S. $\frac{3}{4}$ W., a red spar-buoy will be seen bearing about NW. by N. $\frac{3}{4}$ N., in range with Bluff Point and a little over half a mile off. This is on Horse-Shoe Reef, bare in places at low spring tides, and three hundred yards long in a NNE. and SSW. direction. This shoal lies off the middle

*Horse-Shoe
Reef.*

of the entrance to Mumford's Cove and seven-eighths of a mile to the westward of Groton Long Point. The buoy is placed on its southern extremity in four fathoms, is marked No. 18, and bears from

	Miles.
The spindle on Groton Long Point Reef, W. by N. Northerly -----	$1\frac{3}{8}$
Bluff Point, S. by E. $\frac{1}{4}$ E. -----	$1\frac{3}{8}$
North Hammock Light-house, N. $\frac{1}{2}$ W. -----	$1\frac{1}{8}$

From this buoy

	Miles.
The beacon on Sea-Flower Reef bears SW. $\frac{1}{2}$ S. ----- nearly	$2\frac{3}{4}$
Black Ledge Beacon W. by N. ----- nearly	2
New London Light-house W. by N. $\frac{1}{8}$ N. ----- nearly	3

Sea-Flower Reef, or *Potter's Reef* as it is sometimes called, lies nearly in the middle of the western entrance to Fisher's Island Sound and on the southern side of the entrance to the Pine Island Channel. It is a detached reef about two hundred yards in diameter, nearly bare at low water on its shoalest part, and having not less than five fathoms on all sides of it. On its shoalest part, which is near its western end, is built a square granite beacon painted red and black in horizontal stripes, and surmounted by a spindle with a barrel-shaped cage on top. The beacon should not be approached from the northward nearer than two hundred yards nor from the eastward nearer than three hundred yards. It bears from

	Miles.
Groton Long Point Reef spindle, W. by S. $\frac{1}{4}$ S. -----	$1\frac{3}{8}$
The red buoy on the southern end of the Horse-Shoe, SW. $\frac{1}{2}$ S. ----- nearly	$2\frac{3}{4}$
North Hammock Light-house, NW. Northerly -----	a little over $2\frac{3}{4}$

From this beacon

	Miles.
Black Ledge Beacon bears NW. by W. $\frac{1}{8}$ W. ----- nearly	$1\frac{3}{4}$
New London Light-house NW. by W. -----	$2\frac{3}{4}$
Pine Island Shoal buoy NW. $\frac{1}{4}$ W. -----	$1\frac{1}{2}$

When past Sea-Flower Reef Beacon the course turns to the northwestward towards New London Light-house; and there will soon be seen a little to the northward of the course, bearing about NW. $\frac{3}{4}$ W. and three-quarters of a mile off, a red spar-buoy. This is on Pine Island Shoal, which makes off to the southwestward from the southwestern end of Pine Island about two hundred yards. The buoy is marked No. 2, is placed in eighteen feet to mark the northern limits of the channel, and bears from

	Miles.
Horse-Shoe Reef buoy, W. by N. $\frac{1}{2}$ N. Northerly ----- about	$1\frac{5}{8}$
Sea-Flower Reef Beacon, NW. $\frac{1}{4}$ W. -----	$1\frac{1}{2}$
North Hammock Light-house, NW. Westerly -----	$2\frac{3}{4}$
Race Point, N. $\frac{5}{8}$ W. -----	$3\frac{3}{4}$

From this buoy

	Miles.
Eastern Point bears NW. $\frac{1}{2}$ N. Northerly -----	$2\frac{3}{4}$
New London Light-house NW. by W. $\frac{3}{4}$ W. -----	$1\frac{1}{4}$
The striped buoy on Frank's Ledge W. by N. $\frac{3}{8}$ N. -----	$2\frac{3}{8}$

The sailing-line passes nearly two hundred yards to the southward of the buoy on Pine Island Shoal.

The northern extremity of Black or Southeast Ledge lies about half a mile to the southwestward of Pine Island Shoal buoy. This ledge, as before described on page 413, is an extensive shoal lying nearly NE. and SW. and covering an area six hundred yards long by three hundred and fifty wide.

Black or Southeast Ledge. Its shoalest part, which has two feet at low tide, is nearest its northeastern end; and here is built a stone beacon surmounted by a spindle and cage painted black, the cage being in the shape of two cones joined at their small ends. Over the rest of the ledge the soundings vary from three to twelve feet,—the shoalest water (three feet) being near the southwestern end. Here is placed, as a guide to the Main Channel, a red can-buoy* of the second class, marked No. 2; but vessels using the Pine Island Channel pay no attention to it. The northern end of the ledge is marked by a black spar-buoy (No. 1), placed in fifteen feet water about a hundred and twenty-five yards to the northward of the beacon to mark the southern limits of the Pine Island Channel. This buoy bears from

Pine Island Shoal buoy, W. by S. $\frac{3}{8}$ S. -----	600 yds.
Horse-Shoe Reef buoy, W. by N. $\frac{1}{4}$ N. -----	2 miles.
Sea-Flower Reef Beacon, NW. by W. Westerly -----	$1\frac{3}{4}$ "
North Hammock Light-house, NW. $\frac{1}{4}$ W. -----	$2\frac{1}{2}$ "

From this buoy

Eastern Point bears N. by W. $\frac{1}{4}$ W. -----	Miles.
The striped buoy on Frank's Ledge NW. Northerly -----	1
New London Light-house NW. $\frac{3}{4}$ W. ----- a little over	1

Black Ledge Beacon bears from

The middle of Pine Island, SW. by W. $\frac{1}{4}$ W. ----- about	Miles.
Sea-Flower Reef Beacon, NW. by W. Westerly ----- a little over	1
North Hammock Light-house, NW. $\frac{3}{4}$ W. Westerly -----	2 $\frac{1}{2}$

From the beacon

New London Light-house bears NW. $\frac{3}{4}$ W. ----- about	Miles.
The buoy on Frank's Ledge NW. $\frac{1}{4}$ W. Westerly -----	1 $\frac{1}{2}$
Black Rock N. by W. $\frac{1}{8}$ W. Westerly ----- a little over	1 $\frac{1}{2}$

The course in passes about three hundred and fifty yards to the northward of Black Ledge Beacon and about two hundred and fifty to the northward of the buoy.

Shoal water extends to the southward from that part of the shore between Eastern Point and Avery's Point and is dangerous to large vessels using this channel, as its southern extremity, with seventeen feet upon it, is within one hundred yards of the sailing-line for entering. It is called Avery's Point Shoal, and may be avoided by watching the bearing of New London Light-house,—being careful not to go farther to the northward than to bring it to bear NW. by W. $\frac{1}{2}$ W.,—until past Frank's Ledge. In view of the importance of a knowledge of the exact position of this shoal a red spar-buoy will be recommended to be placed on its southern end.

Avery's Point Shoal.

When abreast of the black buoy on the northern end of Black Ledge a spar-buoy, painted red and black in horizontal stripes, will be seen a little to the southward of the course, bearing nearly WNW. and about eight hundred yards off. This is on Frank's Ledge, a detached ledge, with thirteen feet at low tide, lying nearly half a mile to the westward of Avery's Point. The buoy is on the rock, and bears from

Frank's Ledge.

Black Ledge Beacon, NW. $\frac{1}{8}$ W. Westerly -----	Miles.
The buoy on the northern end of Black Ledge, NW. Northerly -----	1
Pine Island Shoal buoy, W. by N. $\frac{3}{4}$ N. -----	1 $\frac{1}{2}$

From this buoy

New London Light-house bears NW. by W. Westerly -----	$\frac{3}{4}$ mile.
Eastern Point N. by E. $\frac{3}{8}$ E. -----	850 yds.
Fort Point N. by W. -----	2 miles.

The sailing-line passes about one hundred yards to the northward of this buoy.

The marks for Frank's Ledge, should the buoy be gone, are Groton Monument and the hollow in Hob's Island in range on a bearing of N. $\frac{1}{2}$ E.; and the eastern extremity of White Rock just touching the southern end of Powder Island.

When past Frank's Ledge this channel unites with the Main Channel, and the dangers met with will be found described in regular order on pages 413-414.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING NEW LONDON HARBOR.

II. *From the Eastward by the Pine Island Channel.*—Continue the W. $\frac{3}{4}$ N. course through Fisher's Island Sound until you come abreast of the red buoy on Horse-Shoe Reef; when North Hammock Light-house will bear S. by E. $\frac{1}{2}$ E. and New London Light-house NW. by W. $\frac{1}{4}$ W. Steer for the latter, carrying not less than three and a half fathoms, until you are past Frank's Ledge, with the eastern extremity of Fort Point bearing N. $\frac{3}{4}$ W. Westerly and Groton Monument N. $\frac{3}{4}$ E. Now steer N. $\frac{3}{4}$ W. Westerly towards Fort Point until just past the Ocean House, with the monument bearing N. by E. $\frac{1}{4}$ E. and New London Light-house SW. $\frac{3}{8}$ S. The eastern extremity of Winthrop's Point will now bear N. $\frac{1}{4}$ E., and that course, if steered, will lead safely, with not less than four fathoms, to the anchorage abreast of the city. Or, if bound up river beyond the city, you may steer N. $\frac{1}{2}$ E., which will clear Winthrop's Point.

Sailing Directions--Pine Isf- and Channel. The above courses pass nearly seven hundred yards to the southward of the spindle on Groton Long Point Reef; five-eighths of a mile to the northward of the North Dumpling; eight hundred and fifty yards to the southward of the red buoy on Horse-Shoe Reef; a quarter of a mile to the northward of the beacon on Sea-Flower Reef; two hundred yards to the southward of the red buoy on Pine Island Shoal; about one hundred and fifty yards to the northward of the black buoy on the northeastern end of Black Ledge, and two hundred and fifty yards to the northward of Black Ledge Beacon; one hundred yards to the southward of Avery's Point Shoal; one hundred yards to the northward of Frank's Ledge; nearly six hundred yards to the westward of Black Rock; four hundred yards to the eastward of the Quinnepeag Rocks; six hundred and fifty yards to the eastward of The Hog's Back; and three hundred and fifty yards to the eastward of the black spar-buoy on Melton's Ledge.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING NEW LONDON HARBOR.

III. From the Westward.—From Bartlett's Reef Light-vessel steer **NE.** by **E.** $\frac{1}{4}$ **E.**, carrying not less than six fathoms, until the entrance to the river is well open; the striped buoy on Sarah's Ledge is abeam; New London Light-house bears **N.** $\frac{1}{4}$ **E.**, and North Hammock Light-house **E.** by **S.** $\frac{1}{4}$ **S.** Now steer **N.** by **E.** $\frac{1}{8}$ **E.** until you come abreast of the Ocean House, with the eastern extremity of Fort Point bearing **N.** $\frac{3}{4}$ **W.** **Westerly** and New London Light-house **SW.** $\frac{5}{8}$ **S.** Now steer **N.** $\frac{1}{2}$ **E.** for the eastern extremity of Winthrop's Point, which course will lead, with not less than four fathoms, to the anchorage abreast of the city; or, if bound up river beyond the city, steer **N.** $\frac{1}{2}$ **E.**, which will clear Winthrop's Point.

The above courses pass half a mile to the southward of Bartlett's Reef; a quarter of a mile to the southward of the striped buoy on Rapid Rock; the same distance to the southward, and also to the eastward, of Sarah's Ledge; half a mile to the eastward of the black buoy on Cormorant Rock Ledge; three-eighths of a mile to the westward of the striped buoy on Southwest Ledge; the same distance to the eastward of Long Rock; the same distance to the westward of Frank's Ledge; a quarter of a mile to the eastward of the "eleven feet rock" to the southward of Light-house Point; half a mile to the westward of Black Rock; and two hundred yards to the eastward of Quinnepeag Rocks.

GENERAL REMARKS

ON THE THAMES RIVER ABOVE NEW LONDON.

As before mentioned, strangers should not attempt to go above New London without a pilot. There is, however, water sufficient for the largest vessels as far up as the northern boundary of the Navy Yard Reservation. Above this not more than thirteen feet at low water can be taken to abreast of the mouth of Paquatannock Cove, and beyond this cove not more than nine feet to Norwich. The channel is narrow and intricate, and its eastern and western limits are marked only by stakes and bushes.

Above Winthrop's Point, and as far up as the southern boundary of the Navy Yard Reservation, the deep water is close to the eastern bank,—the course being about **N.** $\frac{1}{4}$ **E.** for nearly a mile and three-eighths above the point; beyond which it is about **N.** by **W.** $\frac{1}{8}$ **W.** towards the northern point of entrance to Smith's Cove,—the deep water now approaching the middle of the river. When about a quarter of a mile above Mamicock Point and exactly opposite to the middle of the entrance to Smith's Cove the course turns about **N.** by **E.** for between six and seven hundred yards, or until you come abreast of the southernmost wharf in the Navy Yard. Thence it is **N.** by **W.** $\frac{1}{4}$ **W.** for a quarter of a mile, then **N.** $\frac{1}{2}$ **E.** for a little less than a quarter of a mile, and then **N.** by **E.** $\frac{1}{8}$ **E.** to abreast of Cow Point. Thus far there is not less than four and a half fathoms at low water.

Half a mile above Cow Point a bar is met with three-eighths of a mile wide, across which not more than thirteen feet at low water can be taken. The Main Channel turns towards the western shore, although there is a narrow passage leading close along the eastern bank with not less than sixteen feet as far up as Gale's Ferry. This channel, if buoyed, would offer a passage for steamers with not less than fifteen feet into the Main Channel abreast of Clark's Cove; but it is too narrow for sailing-vessels,—being only about seventy feet wide abreast of the ferry wharf.

Abreast of Gale's Ferry there is not less than twenty feet in the Main Channel, but the bar off Horton's Point has but eighteen feet. Thence the deep water gradually approaches the eastern bank, carrying not less than nineteen feet to Allyn's Wharf, nearly three-quarters of a mile above and on the eastern shore. It then turns towards the middle of the river for about a third of a mile, and then sweeps again in towards the eastern bank, crossing a sixteen-foot bar about half a mile above the wharf.

Above Paquatannock Cove the channel is so narrow and winding that no intelligible description can be given of its course.

LIGHT-HOUSES.

NAME.	Latitude.	Longitude West.			Fixed or Revolving.	Height above sea-level.	Distance visible in nautical miles.
		In arc.		In time.			
	° ' "	° ' "	h. m. s.		Feet.		
New London Light-house	41 18 58	72 5 24	4 48 22	Fixed.	90	15	
Bartlett's Reef Light-vessel	41 15 58	72 7 35	4 48 30	2 Fixed.	28	10	

TIDES.

Corrected Establishment	9 ^h 30 ^m
Mean Rise and Fall of tides	2.5 ft.
Mean Rise and Fall of Spring tides	3.1 ft.
Mean Rise and Fall of Neap tides	2.0 ft.
Mean duration of Rise	5 ^h 56 ^m
Mean duration of Fall	6 ^h 26 ^m
Rise of highest tide observed	3.8 ft.

CURRENTS.

LOCALITY.	Second Quarter.		Third Quarter.		Flood or Ebb.
	Set.	Drift.	Set.	Drift.	
One mile and a half S. by E. $\frac{1}{2}$ E. from New London Light-house	W. $\frac{1}{4}$ N.	1.00	W. $\frac{1}{2}$ N.	1.05	Flood.
	E. by N $\frac{1}{2}$ N.	1.05	NE. by E. $\frac{1}{2}$ E.	1.15	Ebb.
Near Bartlett's Reef Light-vessel	W. $\frac{1}{2}$ N.	1.50	W. by N. $\frac{1}{2}$ N.	2.00	Flood.
	E. $\frac{1}{2}$ S.	1.80	W. Southerly	1.25	Ebb.

The observations for currents were made, as far as possible, when the influence of the wind was small. The bearings are magnetic; the drift in nautical miles per hour.

It is also proper to remark that in light winds, and especially after heavy rains, there is often a strong surface current setting out of the river on the flood tide, by which vessels attempting to reach New London are much embarrassed. In such cases it is best to anchor and wait for a wind.

VARIATION OF THE COMPASS.

The magnetic variation in New London Harbor for 1880 is 9° 25' W., with an approximate annual increase of 2 $\frac{1}{2}$ '.

NIANTIC BAY.

This is a large indentation on the northern shore of Long Island Sound about a mile and a half long with an average width of a mile and a quarter. At its head it receives the waters of Niantic River,—a shallow stream of little importance leading to the village of East Lyme. The village of Niantic is situated on the northern shore of the bay, on the line of the New Haven and New London Railroad. There is good anchorage in from twelve to twenty-one feet, easy of access, and affording good shelter in all winds except those from the southward.

The eastern point of entrance to this bay is called Millstone Point, is low, level and grassy, faced with rocks, and has several houses upon it. To the northward of it the land rises with a very gradual and regular slope, forming the eastern shores of the bay, which are composed of cultivated fields dotted with houses and clumps of trees.

Black Point, the western point of entrance to the bay, is a little over two miles W SW. from Millstone Point. Its southern extremity is quite low and sandy; but about a hundred yards back the land rises somewhat abruptly to a level surface about twenty feet high, which is occupied by cultivated fields backed by a large grove of trees. The point is comparatively bold-to and may be approached within a quarter of a mile with not less than twenty-one feet at low water.

Both shores of Niantic Bay are well cultivated and thickly settled. The village of Niantic is visible, when off the entrance, appearing as a rather straggling cluster of white houses, at its head, but on the western shore. There is a small settlement on the eastern shore at the mouth of the river, and houses thickly dot the slopes on the eastern bank of the river to its head.

Niantic River flows into the bay through a very narrow gut about fifty yards wide, which is crossed by two bridges,—one carrying the county road and the other the Shore-Line Railroad from New Haven to New London. The width of the river at its mouth is thus contracted by a long and narrow sand spit making out from the western shore; but after passing through the gut it spreads out to a width of half a mile, which it keeps for about a mile and a quarter, until **The Divide** is reached, where a branch runs about **N NE.** for nearly three-quarters of a mile, and the main river continues due **N.** to its head at East Lyme. The eastern bank as far up as **The Divide** shows a slightly rolling country almost entirely under cultivation, but dotted here and there with clumps of trees. The western bank is nearly level, cultivated and settled, for about three-quarters of a mile above the mouth of the river; but beyond this it is higher, steeper and well wooded. About three-quarters of a mile above its mouth the western shore is indented by a nearly circular cove about six hundred yards in diameter,—the entrance to which is through a passage about one hundred yards wide; but beyond this the shore is nearly straight to the head of the river.

Two channels lead into Niantic Bay,—the easternmost, called **Two Tree Island Channel**, being used principally by vessels which have come through Fisher's Island Sound, and the other, called the **Main Channel**, passing on the western side of Bartlett's Reef and between Black Point and White Rock. They have equally good water and are well buoyed; but as the Main Channel is much the wider of the two it is perhaps the safer for strangers, more especially as the current in Two Tree Island Channel is apt to interfere with safe navigation during light winds.

DANGERS

IN APPROACHING AND ENTERING NIAN TIC BAY.

In entering Niantic Bay by the Two Tree Island Channel from Fisher's Island Sound the course leads towards Millstone Point, and there will be seen, nearly two miles to the westward, a two-masted light-vessel, painted black, with a white streak; and, about a mile to the northwestward, a spar-buoy painted red and black in horizontal stripes. The former is Bartlett's Reef Light-vessel, and the latter is on Rapid Rock,—the channel passing between them.

Bartlett's Reef (before described on page 376) is a very dangerous shoal, lying on the western side of this channel and off the mouth of Whitestone Creek. It extends **S. by E.** for a mile and a quarter and has upon it many boulders and rocks bare at low water. The southern end of the reef bears from

	Miles.
Goshen Point, SW. $\frac{1}{2}$ S.	about $1\frac{3}{4}$
North Hammock Light-house, W.	a little over 5
Bartlett's Reef Light-vessel, between N. $\frac{3}{4}$ W. and NW. $\frac{3}{4}$ N.	about $\frac{1}{2}$

Its northern end bears from

	Miles.
Bartlett's Reef Light-vessel, N. by W.	$1\frac{3}{4}$
The buoy on Rapid Rock, WNW.	nearly 2
Goshen Point, W. $\frac{1}{4}$ S.	$1\frac{1}{4}$

The main portion of the shoal extends about **S. by E.** from the northern end for nearly a mile, and is in many places bare at low water and in others has from one to nine feet upon it. At the southern end of this main portion the line of the reef is broken by numerous narrow channels with from three to four fathoms in them, which cross the reef from **E.** to **W.** nearly at right angles, and which are separated from each other and from the main portion of the reef by shoal spots with from fifteen to seventeen feet water upon them. These channels are not, however, available for strangers.

About six hundred yards to the southward of the southern end of the main portion of the reef lies the Broken Part, consisting of two shoals lying **E.** and **W.** of each other, with a passage one hundred and fifty yards wide between them. The easternmost shoal is the **Broken Part of Bartlett's Reef**,—being only about two hundred yards in diameter; while the western ledge is a quarter of a mile long **NE.** and **SW.** and about three hundred yards wide. Both are bare at low water near their southwestern ends.

Bartlett's Reef Light-vessel is placed about half a mile to the southward of the Broken Part of the reef, with North Hammock Light-house bearing **E. $\frac{1}{2}$ N.** and New London Light-house **NE $\frac{1}{2}$ N.**, and shows two fixed white lights, visible ten miles. It has a fog-bell and horn for use in thick weather.

Close to the southern end of the Broken Part of the reef is placed a red spar-buoy (marked No. 4) in three fathoms at low water. This buoy bears from the light-vessel **N. by W.**, a little over three-eighths of a mile, and from the striped buoy on Rapid Rock **WSW.**, a mile and a half distant.

Rapid Rock, on the eastern side of the entrance, is a ten feet rock off the southern extremity of Goshen Reef; and the buoy on it (red and black) bears from North Hammock Light-house **W. $\frac{3}{4}$ N.**, three miles and three-quarters; from Bartlett's Reef Light-vessel **$\frac{1}{2}$ E.**, a mile and five-eighths; and from Goshen Point **SE. by S. $\frac{3}{4}$ S.**, nearly seven-eighths of a mile distant. From this buoy the black-buoy on Little Goshen Reef bears **NW. by W.**

$\frac{1}{2}$ W. Westerly, five-eighths of a mile, and the black buoy on the northern end of Bartlett's Reef **WNW.**, a mile and three-quarters distant.

Goshen Reef, which has from seven to ten feet upon it, lies **SE.** by **S.** $\frac{1}{2}$ **S.** from Goshen Point,—its northern end being about three-eighths of a mile from that point. Thence it extends in a **S SE.** direction for a quarter of a mile, at which point is placed a black spar-buoy **Goshen Reef.** (No. 3) in thirteen feet at low water. From this buoy shoal water (not more than seventeen feet) extends to the southward for about three hundred and fifty yards to Rapid Rock. There is no passage between the reef and Goshen Point,—the area between the two being full of shoals and ledges.

Little Goshen Reef lies about a quarter of a mile to the westward of Goshen Reef. It makes off from Goshen Point in a **S.** by **W.** direction for half a mile with soundings over it varying from three to thirteen feet at low water. The shoalest water (three feet) lies close to its southern end, about nine hundred yards from Goshen Point, and here is placed a black spar-buoy (No. 1) in fifteen feet at low water. This buoy bears from the striped buoy on Rapid Rock **NW.** by **W.** $\frac{1}{2}$ **W.** Westerly, five-eighths of a mile, and from Bartlett's Reef Light-vessel **NE.** by **N.** Northerly, a mile and a half distant. From this buoy the black buoy on the northern end of Bartlett's Reef bears **W.** by **N.** $\frac{3}{4}$ **N.**, a mile and a quarter distant. Vessels using this channel pass to the westward of this buoy notwithstanding its color. **Little Goshen Reef.**

When past the buoy on Little Goshen Reef a black spar-buoy will soon appear a little to the westward of the course, bearing about **NW.** by **W.** $\frac{1}{2}$ **W.** and three-quarters of a mile off. This is on the North End of Bartlett's Reef (before described) and marks the turning point in the channel, which is here about six hundred yards wide. The buoy **North End of Bartlett's Reef.** is in three fathoms, is marked No. 1, and bears from the black spar-buoy on Little Goshen Reef **W.** by **N.** $\frac{3}{4}$ **N.**, a mile and a quarter distant. From this buoy the southern end of Millstone Point bears **NW.** by **W.** Westerly, a mile and a quarter; White Rock buoy **NW.** by **W.** $\frac{7}{8}$ **W.**, a mile and five-eighths; and the black buoy on Two Tree Island Shoal **W.** by **N.** $\frac{3}{4}$ **N.**, a little over five-eighths of a mile distant.

To the westward of Goshen Point *the north shore is foul*,—having many ledges and sunken rocks, and it must not be approached nearer than eight hundred yards until you are abreast of the black buoy on the North End of Bartlett's Reef, when you may safely go within an eighth of a mile of it.

When abreast of the northern end of Bartlett's Reef the channel turns more to the westward and there will be seen a little to the southward of the course, and nearly three-quarters of a mile off, a black spar-buoy a short distance to the northward of Two Tree Island. This is on Two Tree Island Shoal, which makes to the northward from Two Tree Island for three hundred yards and has three feet at low water close to the buoy. The buoy, which is marked No. 3, is placed in eighteen feet water off the northern end of the shoal and bears from the black buoy on the northern end of Bartlett's Reef **W.** by **N.** $\frac{3}{4}$ **N.**, nearly three-quarters of a mile distant. From this buoy the southwestern end of Millstone Point bears **NW.** $\frac{1}{4}$ **N.**, thirteen hundred yards, and the red buoy off White Rock **NW.** by **W.** $\frac{1}{2}$ **W.** Westerly, one mile distant. **Two Tree Island Shoal.**

On the northern side of the channel and off the entrance to Whitestone Creek lie dangerous rocks,—to avoid which vessels must not stand to the northward of Millstone Point bearing **W.** by **N.** $\frac{1}{2}$ **N.** Of these the easternmost is called Flat Rock and is bare at low water. It lies about five-eighths of a mile to the northeastward of Two Tree Island and about three hundred and fifty yards from the eastern shore of the approach to Whitestone Creek and is not buoyed. Six hundred yards to the westward of it, and between eight and nine hundred yards to the eastward of Millstone Point, lies another bare rock surrounded by bare ledges and shoal water and called High Rock. Shoal water extends from this rock to the southward for two hundred yards and to the northward for an eighth of a mile, but it is easily avoided by not going to the northward of the southern end of Millstone Point bearing **W.** by **N.** $\frac{1}{2}$ **N.**, as before. **Flat Rock.**

When abreast of the black buoy off the northern end of Two Tree Island Shoal a red spar-buoy will be seen a little to the southward of the course, bearing about **W.** by **N.** $\frac{1}{2}$ **N.** and nearly a mile off. This is placed just to the southward of Little Rock, a very small bare rock about nine hundred yards to the westward of Millstone Point and a hundred yards to the south-eastward of White Rock. The buoy is marked No. 4, placed in fifteen feet on the southern side of the rock, and is usually known as "White Rock Buoy." It bears from the black buoy on the northern end of Two Tree Island Shoal **NW.** by **W.** $\frac{1}{2}$ **W.** Westerly, nearly a mile, and from Millstone Point **W.** $\frac{3}{4}$ **S.**, about eight hundred yards distant. **Little Rock.**

White Rock is a rocky islet about one hundred yards in diameter, lying half a mile **W.** $\frac{1}{2}$ **N.** from Millstone Point. It is very bold-to and may be approached within one hundred yards with not less than three and a half fathoms. It is one hundred and fifty yards to the northward of the buoy. Vessels using the Two Tree Island Channel pass to the eastward of the buoy notwithstanding its color; while those using the Main Channel pass to the westward of it. **White Rock.**

Off Millstone Point, and on its western side, will be seen a red spar-buoy. This is on Millstone Point Reef, which is awash at low water in some places and in others has from two to four feet upon it. It makes off from the western side of Millstone Point and on the southern side of a small and shallow cove called **Millstone Harbor**. The buoy, which is marked No. 2, is placed in fifteen feet on the southwestern side of the rock and the channel passes between it and White Rock buoy,—being here about three-eighths of a mile wide.

When past White Rock another small bare rock, called **Black Rock**, will be seen about three-eighths of a mile to the northward and four hundred yards from the eastern shore of Niantic Bay. It is bold-to on all sides, bears from White Rock nearly due **N.**, distant eight hundred yards, and the sailing-line passes an eighth of a mile to the westward of it. It is easily avoided in day-time, as it is always visible; but at night, or in thick weather, vessels should keep the western shore of the bay best aboard to avoid it.

When to the northward of White Rock, if standing to the westward on a wind, you should be careful not to go inside of sixteen feet to avoid **Three Feet Rock**, which lies a quarter of a mile from the western shore of the bay and about a mile and an eighth to the northward of Black Point. It is marked by a black spar-buoy (No. 5) placed in two fathoms on its eastern side, and bearing from White Rock **W.** by **N. $\frac{1}{4}$ N.**, one mile, and from Black Point **N NE.**, a mile and an eighth distant. Nearly five-eighths of a mile to the northward of it, and about four hundred and fifty yards from the western shore of the bay, is a *rock awash at low water*; and about five hundred yards to the northeastward of this, and an eighth of a mile from shore, is a rocky islet called **Wigwam Rock**, and sometimes **Indian Clump**. Neither of the three last-mentioned rocks are dangerous to vessels bound in by the Two Tree Island Channel unless the wind is foul and they are compelled to tack.

When abreast of Black Rock the course turns abruptly to the northward and there will be seen to the eastward of the course, and about nine hundred yards off, a small bare islet known as **Waterford Island**. It lies about four hundred yards from the eastern shore of the bay and about three-eighths of a mile to the southward of the narrow gut leading into Niantic River. There is no passage to the eastward of it; and a *dangerous sunken reef makes from it to the northward* for three hundred yards to the southern edge of the narrow channel leading into the gut. Vessels must not attempt to pass above Waterford Island without a pilot.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING NIANTIC BAY.

I. By the Two Tree Island Channel from Fisher's Island Sound.—On the course **W. $\frac{3}{4}$ S.** from the Sound towards Bartlett's Reef Light-vessel, when New London Light-house bears **N. $\frac{3}{4}$ E.**, Race Rock Light-house **SE. $\frac{7}{8}$ S.**, and Bartlett's Reef Light-vessel **W. $\frac{1}{2}$ S.** southerly, you will have eleven fathoms and **NW. $\frac{3}{4}$ W.** will lead, with not less than six fathoms, to abreast of the black buoy on the northern end of Bartlett's Reef. When abreast of this buoy, in thirteen fathoms, with Two Tree Island in range with the southern end of Black Point on a bearing of **W. $\frac{1}{4}$ S.**, steer **WNW.** about for the northern end of White Rock, carrying not less than five fathoms. On this course, when you have just passed Millstone Point and are within about six hundred yards of White Rock, steer **NW. $\frac{1}{4}$ N.** towards Wigwam Rock, and anchor at discretion in from fifteen to eighteen feet at low water. *Or*, when you come abreast of Black Rock and are about three hundred yards from it, steer **N. $\frac{1}{4}$ W.** and anchor off the mouth of the gut leading into Niantic River in from ten to seventeen feet at low water.

The above courses pass three-eighths of a mile to the westward of the striped buoy on Rapid Rock; half a mile to the westward of the black buoy on Goshen Reef; a mile and a quarter to the northeastward of Bartlett's Reef Light-vessel; a quarter of a mile to the westward of the black buoy on Little Goshen Reef; two hundred yards to the eastward of the black buoy on the northern end of Bartlett's Reef; between six and seven hundred yards to the southward of Flat Rock; three hundred yards to the northward of the black buoy on Two Tree Island Shoal; six hundred and fifty yards to the southward of High Rock; two hundred yards to the southward of Millstone Point; an eighth of a mile to the southward and three hundred and fifty yards to the westward of the red buoy on Millstone Point Reef; three hundred yards to the eastward of the red buoy off Little Rock; an eighth of a mile to the southwestward of Black Rock; and three-quarters of a mile to the eastward of the black buoy on Three Feet Rock.

The **N. $\frac{1}{4}$ W.** course towards the entrance to Niantic River passes two hundred yards to the westward of Black Rock and the same distance to the westward of the reef north of Waterford Island.

II. *Having come through Long Island Sound, to enter Niantic Bay by pass- Sailing Direc- ing to the Westward of Bartlett's Reef.*—When in The Race, in thirty-five fathoms, with New London Light-house bearing N. $\frac{3}{4}$ E., distant five miles and three-quarters, and Little Gull Island Light-house SW. by W. $\frac{1}{4}$ W., distant about a mile, steer NW. by N. $\frac{1}{4}$ N. and anchor under the northwestern shore of the bay in from fourteen to eighteen feet at low water. Or, when abreast of White Rock, steer N. and anchor off the mouth of the gut leading into Niantic River in seventeen feet at low water.

The above courses pass half a mile to the westward of Bartlett's Reef Light-vessel; nine hundred yards to the westward of the Broken Part of Bartlett's Reef; nearly a mile to the westward of the main portion of Bartlett's Reef; five-eighths of a mile to the westward of Two Tree Island; three-quarters of a mile to the westward of the red buoy on Two Tree Island Shoal; half a mile to the westward of the red buoy on Millstone Point Reef; four hundred yards to the westward of the red buoy on Little Rock; a little over three hundred yards to the westward of White Rock; three-eighths of a mile to the westward of Black Rock; and half a mile to the eastward of the black buoy on Three Feet Rock.

The N. course for the anchorage off the mouth of the gut leading into Niantic River passes an eighth of a mile to the westward of White Rock; three hundred and fifty yards to the westward of Black Rock; and four hundred yards to the westward of the reef north of Waterford Island.

III. *Coming from the Westward through the North Channel of Long Island Sound, to enter Niantic Bay.*—On the course E. $\frac{1}{4}$ S. from between Saybrook Bar and the eastern extremity of Long Sand Shoal, when the middle of Black Point bears N. by E. $\frac{3}{4}$ E., Bartlett's Reef Light-vessel E. $\frac{1}{8}$ S., Little Gull Island Light-house SE. $\frac{1}{2}$ E., and Plum Island Light-house S. $\frac{3}{4}$ W., steer NE. by N., which course will lead safely into the bay with not less than eighteen feet, and up to the anchorage off the mouth of the gut leading into Niantic River with not less than fifteen feet at low water.

This course passes a quarter of a mile to the eastward of Black Point; half a mile to the westward of White Rock; the same distance to the eastward of the black buoy on Three Feet Rock; a quarter of a mile to the northwestward of Black Rock; five-eighths of a mile to the eastward of Wigwam Rock; and two hundred yards to the westward of Waterford Island.

IV. *Having come from the Westward, (intending to pass through Fisher's Island Sound,) to enter Niantic Bay.*—On the course E. $\frac{3}{4}$ N. for the western entrance to Fisher's Island Sound, when the middle of Black Point bears NE. by N. $\frac{3}{4}$ N., Bartlett's Reef Light-vessel E. $\frac{5}{8}$ N., and Little Gull Island Light-house SE. by E. $\frac{1}{8}$ E., steer NE. by N. and follow the directions given above for entering the bay from the North Channel of Long Island Sound.

V. *Having come from the Westward through the Main Channel of Long Island Sound, to enter Niantic Bay.*—On the E. course for The Race, when Little Gull Island Light-house bears E. $\frac{3}{8}$ S., distant a little over six miles and a quarter, and Plum Island Light-house SE. $\frac{5}{8}$ S., distant a little over two miles and an eighth, steer NE. by N. and follow the directions for entering the bay from the North Channel.

VI. *Wishing to anchor under the western shore of Niantic Bay.*—When, on the NE. by N. course, Bartlett's Reef Light-vessel bears SE. by E. $\frac{1}{4}$ E. and the southern extremity of Black Point W. by N. $\frac{1}{2}$ N., eight hundred yards distant, steer N. by E. $\frac{3}{4}$ E. and anchor in from two to three fathoms, according to draught.

This course passes a quarter of a mile to the eastward of Black Point; three-quarters of a mile to the westward of White Rock; four hundred yards to the eastward of the black buoy on Three Feet Rock; the same distance to the eastward of the rock awash to the southward of Wigwam Rock; and three hundred yards to the eastward of Wigwam Rock.

VII. *Having come through the Two Tree Island Channel, to enter the Anchorage off White-stone Creek.*—When, on the course W NW. from abreast of the black buoy on the northern end of Bartlett's Reef, the black buoy on Two Tree Island Shoal comes in range with the southern extremity of Black Point on a bearing of W. $\frac{3}{4}$ S. and the southwestern end of Millstone Point bears NW. by W., a little over three-quarters of a mile distant, steer N. by W. and anchor according to draught in from six to sixteen feet at low water.

The above course passes three hundred yards to the westward of Flat Rock and the same distance to the eastward of High Rock.

There is also another channel leading to this Anchorage, between High Rock and Millstone Point, by bringing Bartlett's Reef Light-vessel to bear E. $\frac{1}{4}$ S., Black Point N. by E. $\frac{3}{4}$ E., and Little Gull Island Light-house SE. $\frac{1}{2}$ E., and steering NE. $\frac{3}{4}$ E., which will lead safely to the anchorage.

This course passes three-quarters of a mile to the southward of Black Point; three-eighths of a mile to the southward of the red buoy off Little Rock; half a mile to the northward of the black buoy on Two Tree Island Shoal; one hundred yards to the southeastward of the three feet rock on the eastern side of Millstone Point; and two hundred yards to the northwestward of High Rock.

ANCHORAGES BETWEEN BLACK POINT AND HATCHETT'S POINT.

Of these there are two,—one nearest to Black Point, off the mouth of **Pattaguansett River**, and the other nearest to Hatchett's Point, off the mouth of **Four Mile River**,—the former being used in easterly and the latter in westerly winds. Neither is recommended to strangers except in cases of emergency.

The approach to Pattaguansett River is, as before remarked on page 348, obstructed by several islands and rocks, which contract the channel and render its course intricate. Of these the northernmost, called **Bluff Island**, lies in the middle of the mouth of the river, about a mile to the northward of Black Point, and has a grove of trees upon it. Three hundred yards to the southwestward of it is a marshy island called **Griswold's Island**, and there are a number of much smaller marsh islands in close vicinity. A group of three islets, known as **The Black-boys**, is the southernmost of the line of islands off Pattaguansett. They lie three-quarters of a mile NW. $\frac{3}{4}$ W. from the southern extremity of Black Point and on the western side of the usual anchorage under that point. There is also, however, good anchorage to the westward of them in three fathoms at low water.

Off the entrance to Four Mile River lie two islets, called **The Brothers**. The northernmost, called **The North Brother**, and sometimes **Goose Rock**, is about a hundred yards in diameter, and lies four hundred yards S. from the eastern point of entrance to Four Mile River and a mile and three-quarters NW. by W. $\frac{1}{2}$ W. from the southern extremity of Black Point. The southernmost, called **The South Brother**, is about one hundred and fifty yards in diameter, lies a quarter of a mile SE. from The North Brother, a little over a mile E. by N. $\frac{1}{2}$ N. from Hatchett's Point, and a mile and three-eighths WNW. from the southern extremity of Black Point. There is a fourteen feet channel between the two islets, but no passage between Goose Rock and the north shore. The channel into Four Mile River passes to the westward of The Brothers.

DANGERS

IN APPROACHING AND ENTERING THE ANCHORAGE UNDER BLACK POINT.

Vessels intending to anchor on the western side of Black Point must give it a berth to the eastward of not less than a quarter of a mile, as it is somewhat foul,—*ten feet at low water* being found two hundred yards from its southwestern end. Nor should they stand too far to the westward on account of the dangerous **Black-boy Rock**, three-quarters of a mile to the westward of Black Point, and which is marked by a red spar-buoy. This rock, which is properly a ledge of rocks, extends N. by E. and S. by W. for nearly six hundred yards and is bare at low water in several places. Its southern end bears W. $\frac{1}{2}$ S. from Black Point; and here is placed the buoy, which is marked No. 4. It is anchored in three fathoms,—Hatchett's Point bearing WNW. **Westerly**, distant a mile and five-eighths. Vessels intending to anchor under Black Point pass to the eastward of this buoy, and those bound for Four Mile River pass to the westward of it.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING THE ANCHORAGE UNDER BLACK POINT.

I. *From the Eastward.*—Bring Bartlett's Reef Light-vessel to bear E., distant two miles and three-quarters, Saybrook Light-house W. by N. $\frac{1}{2}$ N., distant nearly seven miles, and the middle of Black Point N. by W. $\frac{1}{2}$ W., distant a mile and five-eighths, and steer NW. by N. $\frac{1}{2}$ N., which will lead safely to the anchorage, passing a quarter of a mile to the westward of Black Point and nearly half a mile to the eastward of the red buoy on Black-boy Rock. Anchorage is found in from thirteen to seventeen feet, sheltered from northerly and easterly winds.

II. *From the Westward.*—Bring Saybrook Light-house to bear W. by N. $\frac{1}{2}$ N. and Bartlett's Reef Light-vessel E. $\frac{1}{4}$ S. and steer NE. by N. $\frac{3}{4}$ N., which will lead safely to the anchorage, passing four hundred yards to the eastward of the red buoy on Black-boy Rock and three-eighths of a mile to the westward of Black Point.

DANGERS

IN APPROACHING AND ENTERING THE ANCHORAGE OFF FOUR MILE RIVER.

I. *From the Eastward.*—In approaching this anchorage from the eastward the first danger met with is *Black-boy Rock*, previously described. The course passes to the westward of it and continues to the northwestward towards the western point of entrance to Four Mile River. On this course, when nearly abreast of The South Brother look out for John's Rock, a detached rock, with six feet at low water, lying a quarter of a mile S. from the western point of *John's Rock*. entrance to Four Mile River, five-eighths of a mile E. by N. from Hatchett's Point, and half a mile SW. by W. $\frac{3}{4}$ W. from The South Brother. It is not buoyed, and to avoid it vessels intending to anchor in the mouth of Four Mile River should be careful not to go to the westward of the western point of entrance to that river bearing NW. by N. $\frac{1}{4}$ N.

About a quarter of a mile E. $\frac{1}{2}$ N. from the western point of entrance to Four Mile River and the same distance W. by N. $\frac{1}{2}$ N. from the southern end of The South Brother lies *another six feet rock*, about two hundred and fifty yards S. by W. $\frac{1}{4}$ W. from Goose Rock. Neither is this buoyed, and strangers should, therefore, not attempt to make this anchorage, but should pass to the eastward of The Brothers and anchor under Grant's Neck.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING THE ANCHORAGE OFF FOUR MILE RIVER.

I. *From the Eastward.*—Bring Bartlett's Reef Light-vessel to bear E., distant two miles and three-quarters, the middle of Black Point N. by W. $\frac{1}{2}$ W., distant a mile and five-eighths, and Saybrook Light-house W. by N. $\frac{1}{4}$ N., distant nearly seven miles, and steer NW. $\frac{1}{4}$ W., which course will lead safely to the anchorage, passing four hundred yards to the westward of the red buoy on the southern end of Black-boy Rock, the same distance to the eastward of John's Rock, a quarter of a mile to the westward of The South Brother, and an eighth of a mile to the westward of the six feet rock to the southward of The North Brother. Anchor in fifteen feet about two hundred and fifty yards from the western shore.

Or, on the NW. $\frac{1}{4}$ W. course, when past the red buoy on Black-boy Rock, with the southern end of Black Point bearing E., distant a little over a mile, Hatchett's Point W. by N., a mile and a quarter, and Saybrook Light-house W. $\frac{1}{8}$ N., distant five miles, steer N. $\frac{3}{4}$ W., passing two hundred and fifty yards to the eastward of The South Brother and anchoring in from ten to fifteen feet, between Grant's Neck and the entrance to Four Mile River.

DANGERS

IN APPROACHING AND ENTERING THE ANCHORAGE OFF FOUR MILE RIVER.

II. *From the Westward.*—In approaching this anchorage from the westward the first danger met with is Hatchett's Reef, the eastern extremity of that extensive area of shoal ground surrounding the mouth of the Connecticut River. The reef itself lies off Hatchett's Point, has five feet at low water, and from its southern end Black Point bears E. by N. $\frac{1}{8}$ N., distant two miles and three-quarters; the red buoy on the southern end of Black-boy Rock E. by N. $\frac{1}{2}$ N., *Hatchett's Reef*. distant two miles; and The South Brother NE. $\frac{1}{4}$ E., distant a mile and three-quarters. Here is placed, in sixteen feet water, a red spar-buoy (No. 6), and between five and six hundred yards to the northward of it a black spar-buoy (No. 1), marking the northern end of the reef as well as the southern side of the Inshore Channel to the Connecticut River. From this buoy Hatchett's Point bears NNE., distant five-eighths of a mile; The South Brother NE. $\frac{7}{8}$ E., a mile and a half; and the southern extremity of Black Point E. $\frac{3}{4}$ N., two miles and five-eighths distant. When past Hatchett's Reef do not approach Hatchett's Point nearer than five-eighths of a mile, as it is shoal on its eastern side for three hundred and fifty yards. Beyond this the dangers are the same as those described above and are met with in the same order.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING THE ANCHORAGE OFF FOUR MILE RIVER.

II. *From the Westward.*—Bring Saybrook Light-house to bear NW. by W. $\frac{1}{2}$ W., distant nearly three miles and a quarter, the southern extremity of Black Point ENE., three miles and five-eighths, and Plum Island Light-house SSE. Easterly, five miles and a half distant, and steer NE. $\frac{1}{2}$ E. until Black Point bears E. and Saybrook Light-house W. $\frac{1}{4}$ N. Now steer N. $\frac{3}{4}$ W. and anchor off the mouth of Four Mile River in from eleven to fifteen feet at low water.

The above courses pass three hundred yards to the eastward of the red spar-buoy on the southern end of Hatchett's Reef; between eight and nine hundred yards to the eastward of the black spar-buoy on the northern end of that reef; three-quarters of a mile to the eastward of Hatchett's Point; two hundred and fifty yards to the eastward of John's Rock; six hundred yards to the westward of The South Brother; two hundred yards to the westward of the six feet rock to the southward of Goose Rock; and an eighth of a mile to the westward of the latter.

Or, the NE. $\frac{1}{2}$ E. course may be continued until within six hundred yards of Griswold's Island, where anchorage may be found in three fathoms, soft bottom. This course passes three-eighths of a mile to the southward of John's Rock; nearly five-eighths of a mile to the westward of the red buoy on the southern end of Black-boy Rock; and four hundred and fifty yards to the southward of The South Brother.

CONNECTICUT RIVER.

The entrance to this river is about eleven miles and a half to the westward of New London Entrance and is about a mile in width, but is so surrounded by shoals as to render it extremely dangerous to enter it without a pilot. Although shoal, it is one of the longest and most important rivers in New England. Taking its rise at Connecticut Lake, near the northern boundary of New Hampshire, it flows first to the southwestward and then to the southward, forming the boundary line between the States of New Hampshire and Vermont. Thence it crosses Massachusetts into Connecticut, which latter State it divides into two nearly equal parts, and finally empties into Long Island Sound. Throughout this whole length of nearly three hundred miles it is quite shallow, and navigation for vessels of any size is not possible beyond Hartford,—fifty miles above its mouth. Owing to its water power, however, its banks are the sites of important manufacturing towns, of which Greenfield and Springfield, in Massachusetts, and Hartford and Haddam, in Connecticut, are the principal.

The eastern point of entrance to Connecticut River is called **New Breach Point** and sometimes **Griswold's Point**. It is a long, low, narrow and marshy point of land, faced by a sand beach which extends out from the mainland in a nearly WNW. direction for half a mile. It is very foul in its approaches and strangers must not attempt to come near it without the guidance of a pilot.

The western point of entrance to the river is called **Lynde's Point**, and between it and New Breach Point the mouth of the river is a mile wide. Lynde's Point is low, nearly level, and at its eastern extremity bare; but to the westward the land is somewhat higher, dotted with houses, and has a large hotel upon it, which is the most prominent object seen, with the exception of the light-house, on approaching the river. The light-house, which is called **Saybrook Light-house**, is built upon the eastern end of the point and will appear as a tall white tower, with yellow dwelling-house at its base and a bell-frame of open work close by. The tower is sixty-four feet high and shows a fixed white light, of the fourth order, from a height of seventy-three feet above the sea, visible fourteen miles. Its geographical position is

Latitude 41° 16' 15" N.
 Longitude 72° 20' 37" W.,

and it bears from

	Miles.
Bartlett's Reef Light-vessel, W. $\frac{1}{4}$ N.	9 $\frac{1}{2}$
Race Rock Light-house, W. by N. $\frac{3}{4}$ N.	13 $\frac{1}{2}$
Little Gull Island Light-house, NW. by W. $\frac{1}{2}$ W.	11 $\frac{3}{4}$
Plum Island Light-house, NW. $\frac{3}{4}$ N.	8 $\frac{3}{4}$

The open-work tower near the light-house contains the fog-bell, which is struck by machinery, during thick weather, at intervals of twelve seconds.

In approaching Connecticut River from the Sound, Saybrook Point and the village of Saybrook will be seen on the western bank about three-quarters of a mile above Lynde's Point. The point will appear low and nearly level, with a few trees at intervals, and thickly dotted with houses forming the eastern suburbs of the village. Saybrook itself is situated over a mile inland and its thickly clustered houses will appear over the low land of Lynde's Neck. Several wharves will be seen jutting out from the eastern face of Saybrook Point.

Between Saybrook Point on the north and Lynde's Point on the south there makes in to the westward a large cove, bare at low water and called **South Cove**. It is about a mile and an eighth long, runs nearly due W., and has an average width of half a mile. Saybrook Point, on its northern side, is a peninsula seven eighths of a mile long, extending nearly due E. from the mainland, and occupied, as before remarked, by the eastern suburbs of the village of Saybrook. On its northern side another large cove makes in on the western shore and is called **North Cove**. It is likewise bare at low water and is of little importance.

On the eastern bank of the river, a little to the northwestward of New Breach Point, will be seen a strip of white sand beach, apparently extending into the middle of the river. This is **Poverty Island Beach**,—the southern extremity of **Poverty Island**. Poverty Island, which is a marshy island a mile and a quarter long, lying close to the eastern bank of the

river, from which it is separated by a narrow and shallow stream called **Back River**. This beach is the only firm ground on the island and is quite remarkable when seen from the bar. Its western extremity is called **Poverty Point**, and off this point lie extensive flats, which, in connection with the flats between **Saybrook** and **Lynde's** points, diminish the width of the channel to four hundred yards.

Between **New Breach Point** and **Poverty Island** is a shallow passage an eighth of a mile wide, leading into **Griswold's Cove**, **Blackhall River** and **Back River**. **Griswold's Cove** is contained between **New Breach Point** and **Blackhall Point**, which separates it from **Blackhall River**. **Blackhall Point** is low and level, cultivated and settled, and shows somewhat steep faces to the southward. The small settlement of **Blackhall** is situated on this point about three-eighths of a mile back from the river bank.

Griswold's Cove, which is bare at low water, lies between **Blackhall Point** and **New Breach Point**; and **Back River** is a narrow stream running **NW.** and **SE.** and separating **Poverty Island** from the mainland.

Extensive flats lie off the western side of **Poverty Island** and are nearly all bare at low water. Near the western edge of the flats are the remains of two stone piers belonging to the disused shad-fishery. The southernmost is a mere pile of stone abreast of **Saybrook Point** and is called **Second Pier**, and the other, which is less dilapidated and is opposite to **North Cove**, is called **North Pier**.

From **North Cove** the western shore of the river extends in a **NNE.** direction for a mile and a half and is composed of marsh backed by nearly level, cultivated and well-settled lands; and these again by an undulating grassy country extending to the wooded hills in the distance. The eastern shore, which is also marshy, extends in about a **N. $\frac{1}{2}$ W.** direction from **Poverty Point**, for a mile and three-quarters, to **Lyme Ferry**. The mouth of **Back River** is a mile above **Poverty Point** on this shore, and the mouth of **Lieutenant's River** is a mile and five-eighths above the same point and three hundred and fifty yards below **Lyme Ferry**. **Lieutenant's River** leads up to the village of **Lyme**, but neither it nor **Back River** is of any importance.

At **Lyme Ferry** the **Connecticut River** is about six hundred yards wide, and this width it keeps for three-quarters of a mile to the southern end of **Calves' Island**, which lies close in with the eastern bank. The **Shore-Line Railroad** crosses the river at **Lyme Ferry**.

There are several old piers near the western bank, and one or two on the eastern bank, between **Saybrook Point** and **Lyme Ferry**. At the **Ferry** there is quite a settlement on both sides of the river, which has grown up around the eastern and western ends of the railroad bridge, and on the eastern bank extends nearly to **Lyme**, which is five-eighths of a mile inland. Above the **Ferry** the eastern bank of the river is much cut up by coves with outlying islands,—of which **Calves' Island** is the southernmost. This is a marsh island about nine hundred yards long **N.** and **S.** and four hundred yards wide, lying close in with the eastern bank, with a shallow passage one hundred yards wide between it and the eastern shore. Abreast of the middle of the island, and about two hundred yards to the westward of it, will be seen an iron column painted black and surmounted by a lantern. This is known as **Calves' Island Beacon**, is built upon a disused shad-pier on the eastern side of the channel, and shows a fixed white light of the sixth order, visible five miles. The channel passes to the westward of this light and to the eastward of a large pier known as **St. Croix Pier** and is about an eighth of a mile wide.

Two hundred yards to the northward of **Calves' Island** lies **Goose Island**, also marshy. It is half a mile long and nearly triangular in shape,—its greatest width being nearest its northern end, where it is seven hundred yards wide. It lies in the mouth of **Lord's Cove**, a large but shallow indentation on the eastern bank of the river, and has a passage an eighth of a mile wide between it and the eastern shore, and another two hundred yards wide between it and **Lord's Point**,—the western point of entrance to the cove. The eastern shore of **Lord's Cove** is composed of gently sloping land, cleared, cultivated and settled; while its northern and eastern shores are formed by marsh known as **Ely's Meadow**, and which extends from **Lord's Point**, along the eastern bank of the river, to **Ely's Ferry**, a mile and three-quarters above.

A little over half a mile above **Lord's Point** is another marshy island, about seven-eighths of a mile long, called **Nott's Island**. It lies nearest the eastern bank,—being separated therefrom by a shallow passage about a hundred and fifty yards wide, but which is obstructed and rendered unfit for safe navigation by a marshy islet lying midway between **Nott's Island** and the eastern bank. The northern end of **Nott's Island** is half a mile below **Ely's Ferry**, which is situated at the base of a steep partly wooded hill, known as **Ely's Hill**, about three-quarters of a mile above the village of **Essex**.

The western bank of the river, above **Calves' Island**, runs to the northwestward for about a mile and a half to the southern point of entrance to **Essex Harbor** and nearly opposite to the southern end of **Nott's Island**. The land is diversified with marsh, cleared and cultivated fields and woods, and is of moderate height, with a very gentle rise extending to the higher lands to the westward.

Essex Harbor is directly opposite to **Nott's Island**, and is formed by a large cove of irregular shape indenting the western bank of the river. This cove is about nine hundred yards wide between its northern and southern points, but is much obstructed and its available width diminished by a marsh island, called **Thatch-Bed Island**, half a mile long in a **NW.** and **SE.** direction, lying almost exactly in the middle of the cove and separating the harbor into two parts,—that to the northward being known as **North Cove** and that to the southward **South Cove**. The village of **Essex** occupies the northern and western shores of this cove, but its principal wharf-line is on the northern side.

Above Essex no description of the banks of the river would be of use to navigators, as it is not possible to pass beyond the village without a pilot. In fact, strangers should never attempt to cross Saybrook Bar unless compelled by sheer necessity to do so. The bottom is of shifting sand and every heavy gale or freshet causes the channel to change its position. Seven feet at low water is all that can be counted on in crossing this bar, and the jetties built by the United States Engineers have thus far been unsuccessful in deepening the channel. Five and a half feet at low water may be taken up to Essex and about ten feet at high water as far as Hartford; but the channel is narrow, crooked, and obstructed by the exceedingly dangerous shad-piers, (as they are called,) most of which are under water at high tide and some of them exactly in the middle of the channel.

By the system of improvements now in progress under the direction of the Chief of Engineers it is expected to obtain a depth of fourteen feet at mean low water over Saybrook Bar and ten feet at mean low water up to Hartford.

Sailing vessels cannot go above **Middletown**, which is twenty miles above Essex.

DANGERS

IN APPROACHING AND ENTERING CONNECTICUT RIVER.

I. From the Eastward by the Southeast Channel.—The mouth of Connecticut River is surrounded by a very dangerous bar of shifting sand known as Saybrook Bar, and which forms an insurmountable obstacle to strangers. This bar extends to the southeastward from Lynde's Point for a mile

and three quarters, shifts with every gale of wind or freshet, and can only be crossed *Saybrook Bar.* with the assistance of a pilot. A red can-buoy* is placed on its southern extremity in three fathoms water, with Saybrook Light-house bearing **NW. $\frac{3}{4}$ N.**, distant a mile and three-quarters, and Cornfield Point Light-vessel **W. by S. $\frac{1}{4}$ S.**, distant nearly three miles and a half. About nine hundred yards to the eastward of this buoy will be seen a spar-buoy painted white and black in perpendicular stripes, which marks the middle of the entrance to the Southeast Channel. When up with this buoy the course leads directly for the light-house and Saybrook Beacon will soon be seen ahead.

Saybrook Beacon is a stone structure, conical in shape, painted white, and surmounted by an iron spindle with a ball on top. It is placed about a quarter of a mile **E SE.** from the light-house, on a pile of stones belonging to a disused shad-fishery, and marks the western limits of the channel.

When up with Saybrook Beacon the course turns more to the northward towards Saybrook Point, and there are no dangers except the nearly dry flats on both sides.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING CONNECTICUT RIVER.

I. From the Eastward by the Southeast Channel.—This channel is most commonly used by vessels from the eastward, while those from the westward use the Main or Western Channel. The course pursued by those acquainted with the bar, as late as 1879, was to steer **W. $\frac{1}{4}$ N.** from Bartlett's Reef Light-vessel until Cornfield Point Light-vessel bore **W. by S.** and Saybrook Light-house **NW. $\frac{1}{4}$ W.** This latter course, if steered, brought them up with the perpendicularly-striped buoy at the entrance; from which the course was continued towards the light-house, keeping Saybrook Beacon open a little to the southward of it. When abreast of the beacon they are accustomed to steer **NNW.** about for the railroad depot on Saybrook Point, which cannot be mistaken. Passing the point at a distance of two hundred yards, **N. by E. $\frac{1}{4}$ E.** will lead to the draw in the railroad bridge at Lyme Ferry, above which no directions can be given. Nor can the above directions be implicitly relied upon on account of the liability of the bar to change.

DANGERS

IN APPROACHING AND ENTERING CONNECTICUT RIVER.

II. From the Westward by the Main or West Channel.—Vessels intending to enter the Connecticut River from the westward pass to the northward of *Long Sand Shoal*; and when Saybrook Light-house bears **NE. $\frac{1}{4}$ E.** steer to the northeastward towards the end of the western breakwater, passing it close-to. When past this the course turns to the northward and passes to the westward of **Saybrook Beacon**, already described above as a conical stone beacon surmounted by an iron spindle and ball. Beyond the beacon the dangers are the same as those met with in coming in by the Southeast Channel.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING CONNECTICUT RIVER.

II. From the Westward by the Main or West Channel.—On the course **E. Southerly** through the North Channel of Long Island Sound, when past Cornfield Point and Saybrook Light-house bears



Off Mouth of Connecticut River, September 12, 1861, bearing N 71° W, distant 2 1/2 Mps.

New Bedford, N.

September 12, 1861

NE. $\frac{1}{2}$ E., distant about two miles, steer **NE.** by **E. $\frac{1}{4}$ E.** Pass the end of the western jetty close-to and steer **N.** for the light-house until you come abreast of Saybrook Beacon. Now haul gradually to the eastward, steering about **NE.** by **N.** so as to pass about midway between the beacon and the light-house; and then haul to the northward around Saybrook Point, giving it a berth to the westward of about two hundred and fifty yards. As soon as the railway depot on Saybrook Point bears **NNW.** steer for it, and follow the directions given above.

LIGHT-HOUSE.

NAME.	Latitude.	Longitude West.			Fixed or Revolving	Height above sea-level.	Distance visible in nautical miles.
		In arc.		In time.			
	° / "	° / "	h. m. s.			Feet.	
Saybrook Light-house	41 16 15	72 20 37	4 49 23		Fixed.	73	14

TIDES.

Corrected Establishment	10 ^h 9 ^m
Mean Rise and Fall of tides	4.0 ft.

But few observations for tides have been made in this vicinity, and the above are, therefore, only approximate.

CURRENTS.

The set of the tidal current, especially that of the flood, on Saybrook Bar is somewhat remarkable. Young flood sets nearly due **W.**, and as the tide progresses the set gradually changes to the northwestward and northward until about two hours before high water, when it sets **NE.** until the tide is done. Thus at no time during the flood can a vessel be said to have a favorable tide for entering. During the Spring freshets the ebb is said by the pilots to set nearly **SW.** during the whole of the tide, but under ordinary circumstances the current of ebb follows the same conditions as that of the flood. The only observations made by the Coast Survey were taken about a quarter of a mile to the southwestward of Saybrook Bar buoy, and their results will be found embodied in the following table. The set is, of course, magnetic, and the drift in nautical miles per hour.

TABLE.

LOCALITY.	Second Quarter.		Third Quarter.		Flood or Ebb.
	Set.	Drift.	Set.	Drift.	
Four hundred yards W SW. of Saybrook Bar buoy	W. $\frac{1}{4}$ N.	0.82	W. $\frac{1}{4}$ N.	1.45	Flood. Ebb.
	E. by S. $\frac{1}{8}$ S.	1.77	SE. by E. $\frac{1}{4}$ E.	1.42	

VARIATION OF THE COMPASS.

The magnetic variation off Saybrook Bar is, for 1880, 9° 20' W., with an annual increase of 2 $\frac{1}{2}$ ' nearly.

WESTBROOK HARBOR.

This anchorage lies on the northern shore of Long Island Sound and off the mouth of Menunketesuck River, about three miles and a half to the westward of Cornfield Point. It has been already described on page 350. The northern shore of this harbor is formed by low, level and cultivated land, extending to within three-quarters of a mile of the mouth of Menunketesuck River, where marsh land takes its place. The harbor is only of importance as an anchorage, as both the **Menunketesuck** and **Westbrook** rivers are nearly dry at low water and no detailed description of them would be of any avail to mariners.

The western point of entrance to the harbor is known as **Menunketesuck Point**, and is low, nearly level and grassy, with sandy faces protected by a line of boulders at their base. A single small white house stands upon this point near its southern end; and the point itself, which extends in a southeasterly direction for about five-eighths of a mile, forms a natural breakwater, protecting the harbor from westerly winds.

About a mile and a quarter to the northeastward of Menunketesuck Point and four hundred yards from the northern shore of the Sound lies **Salt Island**, about a hundred and fifty yards long. It is low and rocky, destitute of trees, connected with the shore at low water, and marks the eastern point of entrance to this harbor.

DANGERS

IN APPROACHING AND ENTERING WESTBROOK HARBOR.

Vessels which have come through the North Channel of Long Island Sound and wish to enter Westbrook Harbor continue on the **W. Northerly** course until Cornfield Point bears **NE. $\frac{3}{4}$ E.** and Cornfield Point Light-vessel **SE. $\frac{1}{2}$ E.**, when the course leads to the northwestward, and there will soon be seen a little to the eastward a red spar-buoy. This is on Crane Reef, a detached shoal about six hundred yards long in a **N. and S.** direction, with four feet at mean low water. The buoy is placed on its southern end in three fathoms, is marked **No. 12**, and bears from the spindle on The Hen and Chickens (between the reef and Cornfield Point) **W. $\frac{1}{4}$ S.**, distant seven-eighths of a mile, and from Cornfield Point Light-vessel **NW. $\frac{1}{2}$ N.**, distant a little over two miles.

When past the buoy on Crane Reef, vessels beating in must be careful not to stand too close to Menunketesuck Point on account of Menunketesuck Point Shoal, which extends from the point in a **S SE.** direction for seven hundred yards, has less than eight feet upon it at low water, and is not buoyed. It is the southwestern extremity of the extensive flats making off from the northern shore of Westbrook Harbor and must be carefully avoided. These flats form the principal obstruction to the harbor and have several prominent rocks within their boundaries. Of these, the first met with is formed by the remains of a shad-pier (now disused) and known as Old Pier, which lies half a mile **N NE.** from Menunketesuck Point and the same distance to the eastward of the mouth of the river.

A line of rocks lies about an eighth of a mile to the eastward of Old Pier, and a bare rock called Great or Lobster Rock lies three hundred yards **NE.** by **N. $\frac{1}{2}$ N.** from the pier and a quarter of a mile from the northern shore of the harbor. These are all the dangers. Anchorage is found in from seven to twelve feet, with good holding-ground and shelter in northerly and northwesterly winds.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING WESTBROOK HARBOR.

I. From the Eastward.—On the course **W. Northerly** through the North Channel of Long Island Sound, when Cornfield Point bears **NE. $\frac{3}{4}$ E.**, one mile and seven-eighths, and Cornfield Point Light-vessel **SE. $\frac{5}{8}$ E.**, one mile and a half distant, you will have seven fathoms and **NW.** by **N. $\frac{3}{4}$ N.** will lead safely to the anchorage. The lead should be kept going after passing Crane Reef, and, as the water shoals very gradually, a vessel will by this means be enabled to choose her anchorage according to draught. Good shelter in northerly and westerly winds will be found about half a mile from the north shore, in ten feet water, with Cornfield Point bearing **E.** by **S. $\frac{3}{4}$ S.** and the southern end of Menunketesuck Point **SW. $\frac{1}{2}$ W.**

The above courses pass four hundred yards to the westward of the red buoy on Crane Reef; three-quarters of a mile to the eastward of Menunketesuck Point; three-eighths of a mile to the eastward of the rocks off Old Pier; half a mile to the westward of Salt Island; and three-eighths of a mile to the eastward of Lobster Rock.

There is also another channel from the Eastward, by which vessels may enter Westbrook Harbor and anchor either under Cornfield Point or Menunketesuck Point; but it is not recommended to strangers,—not being buoyed. It leads on the northern side of Cornfield Point Shoal, and between Cornfield Point and The Hen and Chickens; to the northward of Crane Reef; and thence into the harbor. There are a number of very dangerous shoals to the westward of Cornfield Point which are not buoyed, and it would not be safe, therefore, for strangers to attempt this passage.

Vessels intending to enter by this channel should, when Saybrook Light-house bears **NW.** by **N. $\frac{1}{4}$ N.**, distant one mile and three-quarters, and Cornfield Point Light-vessel **W.** by **S. $\frac{1}{4}$ S.**, distant three miles and three-eighths, (or, in other words, when they have just passed Saybrook Bar buoy and are in the entrance to the North Channel,) steer **W.** by **N. $\frac{1}{2}$ N.**, which course leads, with not less than three and a half fathoms, past Cornfield Point. On this course, if they intend to anchor under Cornfield Point they bring the spindle on The Hen and Chickens to bear **S.** and steer **N.**, anchoring, according to draught, in from ten to fifteen feet at low water.

These courses pass four hundred yards to the northward of the red buoy on Cornfield Point Shoal; a quarter of a mile to the southward of Cornfield Point; six hundred and fifty yards to the northward of the spindle on The Hen and Chickens; three hundred and fifty yards to the southward, and six hundred yards to the westward, of the bare rock half a mile to the westward of Cornfield

Point; seven hundred yards to the westward of the reef of rocks half a mile to the *Sailing Direc-*
northward of Cornfield Point; and three hundred yards to the westward of the rock *tions---West-*
awash off the mouth of Oyster River. *brook Harbor.*

But, wishing to anchor in Westbrook Harbor, the *W.* by *N.* $\frac{1}{2}$ *N.* course should be continued until the northern end of Duck Island bears *W.* $\frac{1}{4}$ *S.* and is nearly on with the southern extremity of Menunketesuck Point. Here the depth will be fifteen feet and *NW.* by *N.* $\frac{3}{8}$ *N.* will lead to the anchorage, as before described.

These courses pass seven hundred yards to the northward of the spindle on The Hen and Chickens; five-eighths of a mile to the northward of the red buoy on the southern end of Crane Reef, and eight hundred yards to the northward of the northern end of the reef; nine hundred yards to the southward of the long reef off Old Kelsey's Point; three-quarters of a mile to the eastward of Menunketesuck Point; half a mile to the westward of Salt Island; and three-eighths of a mile to the eastward of Lobster Rock.

There is also a good passage about four hundred yards wide, and with from two to three and a half fathoms in it, which leads to the northwestward, between Cornfield Point and the bare rock half a mile to the westward of it, and thence to the anchorage off the mouth of Oyster River. But it is used only by those who are local pilots and must never be attempted by strangers. The same remark is true of *the passage between The Hen and Chickens and Crane Reef,* which is nine hundred yards wide, with not less than fifteen feet at low water. In cases of emergency this channel may be used by bringing Cornfield Point Light-vessel to bear *SE.* by *S.* $\frac{1}{4}$ *S.* and steering *NW.* by *N.* $\frac{1}{4}$ *N.*, which will lead directly towards Salt Island. Great care must be exercised, however, in keeping the range, as the current of both flood and ebb sets directly across the course.

II. Coming from the Westward, to enter Westbrook Harbor.—On the course *E.* Southerly through Long Island Sound, when off Kelsey's Point, with Hammonasset Point bearing *NW.* $\frac{3}{4}$ *W.*, distant two miles and three-eighths, Duck Island *NE.* $\frac{1}{8}$ *N.*, one mile and seven-eighths, and Cornfield Point Light-vessel *E.* by *S.*, distant nearly five miles, steer *NE.* by *E.* $\frac{1}{2}$ *E.*, which course will lead, with not less than six fathoms, to abreast of Menunketesuck Point. On this course, when Menunketesuck Point bears *NW.* by *N.* $\frac{1}{8}$ *N.*, distant half a mile, Cornfield Point *E.* Southerly, three miles, and Cornfield Point Light-vessel *SE.* $\frac{3}{4}$ *E.*, distant three miles and three-eighths, steer *NNE.* if intending to anchor on the Westbrook side; or *E.* by *N.* $\frac{3}{4}$ *N.* for the anchorage off the mouth of Oyster River.

The courses for Westbrook Harbor pass three-eighths of a mile to the southward of the shoal south of Duck Island; three hundred yards to the southward of Menunketesuck Point Shoal; six hundred and fifty yards to the eastward of the rocks off Old Pier; eight hundred yards to the eastward of Lobster Rock; and seven hundred yards to the westward of Salt Island. The course for the anchorage off Oyster River passes seven-eighths of a mile to the northward of the red buoy on the southern end of Crane Reef; five-eighths of a mile to the northward of the northern end of that reef; and a hundred and fifty yards to the southward of the reef off Old Kelsey's Point.

DUCK ISLAND HARBOR.

On the western side of Menunketesuck Point the northern shore of the Sound forms a large semicircular cove, called Duck Island Harbor, in which anchorage is found in from eight to eighteen feet at low water. It is almost entirely unobstructed, and may be entered with safety from the eastward by passing between Menunketesuck Point and Duck Island; and from the westward by passing between the latter and Kelsey's Point. Its shores are about equally divided between marsh and grass lands,—the latter having steep faces varying in height from ten to forty feet. In the vicinity of Lewis' Landing, however, which is nearly midway between Menunketesuck and Kelsey's points, there is a large grove of trees with several houses on the bluff, which is here about fifty feet high. A wharf about a hundred and fifty yards long extends out from the base of the bluff to the edge of the six feet curve; and there are several large houses in the midst of ornamental grounds a little over half a mile to the eastward of the wharf and about two hundred yards back from the shore.

Menunketesuck Point has been already described on page 429. Kelsey's Point, the western point of entrance to the cove, is level and grassy, with steep faces twenty feet high and bare ledges cropping out over its surface, and a dilapidated dwelling upon it. Seen from the eastward low thick woods appear behind the point and in the distance high hills,—one of which presents a remarkable appearance, as if the summit and middle part were composed of bare sand while the rest is wooded. The point is shoal and must not be approached from the southward nearer than three-quarters of a mile. Kelsey's Point.

About five-eighths of a mile to the southwestward of Menunketesuck Point lies a grass-covered islet, about thirty feet high, called Duck Island. It is about two hundred and fifty yards long **N.** and **S.**, about fifty yards wide, has perpendicular faces about ten feet high, and is surrounded by boulders. Shoal water (less than twelve feet) extends from it to the southward for three hundred and fifty yards and to the northward the same distance; but a tolerably good passage, in no place less than three hundred yards wide and with not less than twelve feet water, leads between the island and Menunketesuck Point and is commonly used by vessels from the eastward seeking an anchorage. This passage is formed by a gully, with from two to seven fathoms water in it, scooped out between the island and the rocks to the westward of Menunketesuck Point.

DANGERS

IN APPROACHING AND ENTERING DUCK ISLAND HARBOR.

I. From the Eastward.—In approaching this anchorage from the eastward, from the North Channel, it is necessary to look out for Crane Reef, already described on page 430 as a detached shoal about six hundred yards long **N.** and **S.**, with four feet at low water. It is marked by a red spar-buoy (No. 12) placed on its southern end in three fathoms, with the spindle on The Hen and Chickens bearing **E. ½ N.**, distant seven-eighths of a mile; Cornfield Point Light-vessel **SE. ½ S.**, a little over two miles; the southern end of Menunketesuck Point **NW.** by **W. ½ W.**, a mile and seven-eighths; and the southern end of Duck Island **W.** by **N. ½ N.**, distant a little over two miles and a quarter. To avoid this reef vessels intending to enter this harbor should not stand to the eastward of Cornfield Point Light-vessel bearing **SE.**

When past Crane Reef look out, on the northern side of the channel, for Menunketesuck Point Shoal, which extends from the southern end of the point in a **SSE.** direction for about seven hundred yards with less than eight feet water. For about one hundred and fifty yards of this distance the shoal is bare at low water. Two small rocks, always out, are noticeable on approaching this reef, and are called the Coot Rocks. The northernmost, which is a hundred and fifty yards from the southern end of the point, is called Inner Coot Rock, and the southernmost, two hundred and fifty yards from the point, is known as Outer Coot Rock. Vessels of twelve feet draught must give the Outer Coot Rock a berth to the northward of about two hundred yards in order to avoid this shoal.

Do not approach the eastern side of Duck Island nearer than five-eighths of a mile if you draw more than nine feet, as there is a *very long shoal making off to the eastward from the island for over five hundred yards* with from ten to twelve feet upon it. Also, give Menunketesuck Point a berth to the eastward of not less than four hundred yards to avoid the dangerous rocks, known as Menunketesuck Ledges, which lie to the westward of it. These ledges are detached from the mainland (with a channel between them and the point two hundred yards wide, with from ten to fifteen feet water) and cover an area a hundred and fifty yards long **N.** and **S.** by fifty yards wide. They are in places bare at low water, and in others have from two to five feet upon them and are not buoyed. To avoid them it is necessary to give the point the wide berth to the eastward mentioned above. There is a *small detached rock, with four feet at mean low water*, about forty yards to the westward of the main shoal, with twelve feet close to it; but the sailing-lines pass well to the westward of it.

If beating up to the anchorage, give the northern end of Duck Island a berth to the southward of not less than four hundred yards in order to avoid Duck Island North Reef, which makes off in a **N NE.** direction from the northern end of the island for about three hundred yards with less than twelve feet at mean low water. The shoal of the reef has from two to six feet upon it, and five feet is found nearly three hundred yards from the northern end of the island. It is not buoyed; and this fact, in connection with the absence of buoys on the other obstructions, renders this channel unsafe for strangers.

Beyond Duck Island North Reef there are no dangers except one or two small shoals so near the shore as not to be in the way.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING DUCK ISLAND HARBOR.

I. From the Eastward.—On the **W.** Northerly course through the North Channel of Long Island Sound, bring Cornfield Point Light-vessel to bear **SE. ¼ E.** and steer **NW. ¼ W.**, carrying not less than eighteen feet water, until you come abreast of the southern end of Duck Island bearing **SW. ¼ S.**, about six hundred and fifty yards distant, and the house on Menunketesuck Point bears **E.** by **N. ½ N.**, three-eighths of a mile distant. Here you will have four fathoms, with the southern end of the wharf at Lewis' Landing bearing **NW. ½ N.**, and that course will lead safely to the anchorage. The water shoals very gradually, and vessels will anchor according to their draught, and will be well sheltered from northerly and easterly winds.

The above courses pass half a mile to the southwestward of Crane Reef; an eighth of a mile to the southward, and the same distance to the westward, of Menunketesuck Point Shoal; an eighth of a mile to the westward of Menunketesuck Ledges; one hundred yards to the northeastward of the northeastern extremity of the shoal making off from the eastern side of Duck Island; and two hundred yards to the eastward of the extremity of Duck Island North Reef.

Or, on the W. Northerly course, as before, when Cornfield Point Light-vessel bears **SE.** by **E.** $\frac{1}{2}$ **E.**, Menunketesuck Point **NW.** $\frac{3}{4}$ **N.**, and Cornfield Point **NE.** by **E.** $\frac{1}{2}$ **E.**, with Falkner's Island directly ahead, steer **NW.** $\frac{1}{4}$ **N.**, which course will lead directly for the wharf at Lewis' Landing, passing seven-eighths of a mile to the southwestward of Crane Reef; three hundred yards to the westward of Menunketesuck Point Shoal; a little over one hundred yards to the eastward of the shoal making off from the eastern side of Duck Island; an eighth of a mile to the westward of Menunketesuck Ledges; and nearly three hundred yards to the eastward of the extremity of Duck Island North Reef.

But, wishing to enter the harbor by passing to the southward of Duck Island and then between the island and Kelsey's Point.—On the **W. Northerly** course through the North Channel of Long Island Sound, when Duck Island bears **N.** $\frac{3}{4}$ **W.**, distant a mile and three-eighths, and Kelsey's Point **NW.**, distant about two miles and three-eighths, steer **NW.** by **N.** $\frac{1}{2}$ **N.**, which will lead safely to the anchorage.

If beating in you must not approach the southern end of Duck Island nearer than three-eighths of a mile to avoid *Duck Island South Reef*, which makes off to the southward about four hundred yards with less than twelve feet water. Six feet at low water is found upon this reef an eighth of a mile from the southern end of the island; and as it is not buoyed care should be taken to give the island a good berth to the northward. A good rule is not to stand to the northward of Falkner's Island Light-house bearing **W.** $\frac{1}{2}$ **S.** until you are to the westward of the reef. Also, on the westerly tack, vessels should give Kelsey's Point a berth to the northward of a mile to avoid *Kelsey's Point Shoals*, which make off from that point in a southwesterly direction for three-quarters of a mile and are formed by several ledges, known, respectively, as *Stone Island Ledge, East Ledge and Stone Island Reef*. Narrow passages, with over three fathoms water, exist between the two last mentioned; and Stone Island Reef has also several deep channels crossing it at right angles, in which from four to six fathoms may be found. Strangers, however, should not attempt any of these passages, but should be guided by the buoy, which is a red spar, placed in four fathoms seven-eighths of a mile **SSW.** from Kelsey's Point and an eighth of a mile **SW.** from the southern end of Stone Island Reef. (See also description of these shoals in the approaches from the westward.)

DANGERS

IN APPROACHING AND ENTERING DUCK ISLAND HARBOR.

II. From the Westward.—A vessel from the westward wishing to anchor in this harbor should bring Falkner's Island Light-house to bear **W. Northerly** and steer **E. Southerly** until Hammonasset Point bears **N.** $\frac{1}{8}$ **W.**, distant a mile and three-eighths, and Cornfield Point Light-vessel **E.** $\frac{3}{4}$ **S.** Now steer **NE.** by **E.** $\frac{1}{2}$ **E.**, which course will lead up to the red buoy on the southern end of Kelsey's Point Shoals. These shoals, as before mentioned, lie off Kelsey's Point, and are composed exclusively of rocky ledges. The northernmost, called *Stone Island Ledge*, makes off from the southern end of Stone Island nearly due **S.** for about four hundred yards with less than twelve feet water. The easternmost, called *East Ledge*, is composed of a number of small rocks lying about **SSW.** from Kelsey's Point and extending in that direction about six hundred and fifty yards *Kelsey's Point Shoals.* with a depth in no place greater than twelve feet. The northernmost of these rocks lies three hundred yards from the point and has four feet upon it. There is a passage between it and the point leading between Stone Island and the northern shore and in which seven feet at low water exists; but it is very narrow, full of dangerous sunken rocks, and unsafe for strangers. A little over a hundred yards to the southward of the northernmost rock and four hundred and fifty yards from Kelsey's Point is another rock with two feet at mean low water; and about one hundred and fifty yards to the southward of this still another,—the southernmost of the group. This latter is nearly one hundred yards long **N.** and **S.**, has four feet on its northern end and two feet at its southern extremity, which bears from the middle of Duck Island **W.** $\frac{1}{4}$ **N.**, distant a mile and a half.

Between the southern extremity of East Ledge and the northern end of Stone Island Ledge there is a passage, two hundred and fifty yards wide with not less than twelve feet at low water, and over

one hundred yards wide with not less than fifteen feet; but this channel should not be attempted by any but those thoroughly acquainted with the locality.

Stone Island Reef, the southernmost of the Kelsey's Point Shoals, is formed by three separate rocks, with from ten to twelve feet water upon them, which lie in a line **N NW.** and **S SE.**, with deep channels between them. The northernmost rock, which has ten feet, is about six hundred and fifty yards due **S.** from Stone Island; the middle rock, a hundred and seventy-five yards to the southward of this and nearly seven-eighths of a mile from Stone Island, has eleven feet; and the southernmost rock, which has twelve feet, is nearly three hundred yards to the southeastward of the middle rock, and bears from Kelsey's Point **S.** by **W.** $\frac{1}{2}$ **W.**, distant nearly three-quarters of a mile.

Stone Island Reef. A passage with not less than seventeen feet and a hundred and twenty-five yards wide leads between the northern and middle rocks; another, one hundred yards wide and with not less than nineteen feet, leads between the middle and southern rocks; but neither should be attempted by strangers. Three hundred and fifty yards **SW.** from the twelve feet rock, on the southern end of the reef, is placed a red spar-buoy (No. 14) in four fathoms,—the southern end of Duck Island bearing **E.** by **N.**, distant one mile and three-quarters. When past this buoy there are no dangers unless the wind be to the eastward and it is necessary to beat to windward; in which case the northern end of Duck Island should receive a berth to the southward of not less than three hundred and fifty yards.

The lead will show how near you should approach the northern shore; and there are otherwise no dangers.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING DUCK ISLAND HARBOR.

II. From the Westward.—On the course **E.** by **S.** $\frac{1}{2}$ **S.** through the North Channel of Long Island Sound, when Falkner's Island Light-house bears **W.** **Northerly**, Hammonasset Point **N.** $\frac{1}{2}$ **W.**, and Cornfield Point Light-vessel **E.** $\frac{3}{4}$ **S.**, steer **NE.** by **E.** $\frac{1}{2}$ **E.**, which course will bring you up with the red spar-buoy off the southern end of Stone Island Reef, passing about one hundred and fifty yards to the southward of it. If intending to anchor under Kelsey's Point, continue the course to the eastward until the southern end of Duck Island bears **E.** **Southerly**, distant three-quarters of a mile, and the northern end of the same island is brought in range with the southern extremity of Menunketesuck Point. Here the depth will be seventeen feet and **N.** by **E.** $\frac{1}{4}$ **E.** will lead safely to the anchorage.

Or, wishing to anchor under Menunketesuck Point, continue the course (**NE.** by **E.** $\frac{1}{2}$ **E.**) until to the eastward of Duck Island, and anchor according to draught. This latter course passes four hundred and fifty yards to the northward of Duck Island North Reef.

KILLINGWORTH HARBOR.

This harbor lies to the westward of Kelsey's Point,—its entrance being between Hammock Point on the east and Hammonasset Point on the west. It is a cove about three-quarters of a mile wide but very shallow, which receives the waters of **Hammonasset** and **Indian** rivers. Not more than two feet at low water can be taken to the mouth of the latter, on the banks of which is situated the village of **Clinton**. The shores of the harbor are for the most part of marsh except in the neighborhood of Clinton, which lies amid level lands finely cultivated.

The anchorage in Killingworth Harbor is not considered good except for small vessels, and strangers should not attempt to enter it.

Hammock Point, the eastern point of entrance to this harbor, is nearly level, about thirty feet high, with steep faces, and covered with grass. It is fringed with rocks, which at low water extend to the westward about one hundred and fifty yards. It is half a mile to the westward of Kelsey's Point.

Hammonasset Point, the western point of entrance, is a mile to the westward of Hammock Point and is for the most part marshy land, although at its western extremity there is grass land with somewhat undulating surface, terminating in a bluff,—the steep faces and base of which are strewn with boulders. There is a group of old unpainted houses on this bluff.

DANGERS

IN APPROACHING AND ENTERING KILLINGWORTH HARBOR.

The only danger in this harbor, after passing Stone Island Reef buoy, is **Wheeler's Rock**, with four feet water, which lies about three-eighths of a mile to the westward of Hammock Point and about midway between it and the western shore. It is marked by a red spar-buoy (No. 4) placed in two fathoms on the western side of the rock,—Hammock Point bearing **E.** $\frac{1}{2}$ **N.**, seven hundred yards, and **Sandy Point** (the southern point of entrance to Hammonasset River) **N.** by **E.** $\frac{1}{2}$ **E.**, a little over half a mile distant.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING KILLINGWORTH HARBOR.

I. *From the Eastward.*—On the **W.** Northerly course through the North Channel of Long Island Sound, when Hammonasset Point bears **NW.** $\frac{3}{4}$ **W.**, distant two miles and three-eighths, steer **NW.** by **N.** $\frac{1}{4}$ **N.**, which course will lead to the buoy on Wheeler's Rock. Pass to the westward of this buoy and anchor off **Old Pier** in twelve feet at low water; *or, if bound to Clinton,* steer **NE.** by **N.** $\frac{3}{4}$ **N.**, with Sandy Point a little to the westward of the course. There is not more than two feet at low water as far up as Sandy Point and strangers must not attempt to enter the harbor.

The above course passes three hundred yards to the westward of the red buoy on the southern end of Stone Island Reef; fifty yards to the westward of the red buoy on Wheeler's Rock; and one hundred and fifty yards to the eastward of Old Pier.

II. *From the Westward.*—On the course **E.** by **S.** $\frac{1}{8}$ **S.** from off The Thimbles, when Hammonasset Point bears **NE.** by **E.** Easterly and Falkner's Island Light-house **W.** $\frac{1}{2}$ **S.**, steer **E NE.** until Hammonasset Point bears **W.** $\frac{1}{8}$ **N.**, distant about five-eighths of a mile. Here the depth will be twelve feet and **NE.** by **N.** $\frac{3}{4}$ **N.** will lead to the red buoy on Wheeler's Rock, as before.

The above courses pass six hundred yards to the southward of Hammonasset Point and fifty yards to the westward of the red buoy on Wheeler's Rock.

GUILFORD HARBOR.

This harbor is situated about five miles to the westward of Hammonasset Point, but is seldom resorted to as a harbor of refuge on account of the numerous shoals which obstruct the approach to it. Under the most favorable circumstances it is fit for vessels of very light draught only, and strangers seeking shelter from easterly gales should anchor under Hammonasset Point or off Madison.

Guilford Harbor is formed by a large but shallow cove nearly a mile wide at its mouth, and which receives the waters of a very small, narrow and crooked stream called **East River**. Another and smaller stream leads from the western side of the harbor to the town of **Guilford**, whose suburbs extend to the north shore of the harbor but whose centre is situated about a mile inland. All of the land near the shore-line is marshy except a small portion on its northern side, where the wharves are built and upon which there are a number of houses.

Mulberry Point, the western point of entrance to the harbor, is low, rocky and nearly level, and faced with innumerable boulders; and there are also many outlying rocks off the point.

There are so many outlying dangerous reefs off **Mulberry Point** that it is not safe to approach it nearer than five-eighths of a mile.

DANGERS

IN APPROACHING AND ENTERING GUILFORD HARBOR.

1. *From the Eastward.*—Vessels passing through the North Channel of Long Island Sound and intending to anchor in Guilford Harbor must first look out for **Charles' Reef**, about a mile to the southward of Hogshead Point and three miles and three-quarters to the westward of Hammonasset Point. This is a rocky shoal about a quarter of a mile long **NE.** by **Charles' Reef**, **N.** and **SW.** by **S.**, with ten feet near its northern end and nine feet at its southern end. A red spar-buoy (No. 8) is placed in eighteen feet water on the southwestern side of the reef,—Falkner's Island Light-house bearing **SW.** by **S.**, two miles and three-eighths distant, and **Mulberry Point** (the western point of entrance to the harbor) **W.** by **N.** $\frac{1}{2}$ **N.**, nearly two miles and a quarter distant. This buoy should be removed from its present position to the southeastern end of the reef, and such change will be recommended.

When past **Charles' Reef** you will soon strike shoal water on the southern edge of what are known as **Guilford Shoals**,—a name under which are included all of the reefs and ledges lying off the northern shore between Hogshead Point and Sachem's Head. They are for the most part dry at low water and some of them are always out. The first met with on the course into the harbor will appear to the eastward of the sailing-line and is called **Half-acre Island**. It is a mass of bare rock about sixty yards long at low water, with its summit always out, and is surrounded by very dangerous sunken rocks. There is no passage to the northward of it,—*bare rocks and sunken ledges, with from two to six feet water*, extending all the way to the north shore. The sailing-line passes about an eighth of a mile to the westward of the island.

The middle of **Half-acre Island** bears from Falkner's Island Light-house **N.** $\frac{1}{8}$ **E.**, two miles and a half; from **Mulberry Point** **E.** $\frac{3}{8}$ **S.**, a mile and an eighth; and from the red buoy on **Charles' Reef** **NW.** by **W.** $\frac{1}{4}$ **W.**, a little over half a mile distant.

On the western side of the approach, and three-quarters of mile to the westward of Half-acre Island, lies Lobster Rock, a bare islet about seventy yards long at low water and lying N. by E. and S. by W. Dangerous rocks surround it,—many of them bare at low water and some of them always out, and the sailing-line passes half a mile to the eastward of it. On the eastern end of the shoal making off from Lobster Rock, and which is known as *Nettie's Reef*, is placed a black spar-buoy (No. 1). This buoy is in fifteen feet water and marks the western limits of the channel.

Lobster Rock bears from

Half-acre Island, W. $\frac{3}{4}$ S.-----	$\frac{3}{4}$ mile.
Mulberry Point, SE. by E. $\frac{1}{8}$ E.-----	about 900 yards.
Falkner's Island Light-house, N. $\frac{3}{4}$ W.-----	2 $\frac{3}{8}$ miles.
Sachem's Head, E. by N.-----	1 $\frac{1}{4}$ "

After passing between Half-acre Island and Lobster Rock the water is all shoal and no intelligible description of the dangers can be given; but about a quarter of a mile to the northward will be seen a black spar-buoy (No. 3). This is in twelve feet water, on the eastern end of what are locally known as *Riding Rocks*, and vessels from the eastward must be careful to give it a berth to the westward,—the main channel-way lying to the eastward of the buoy. As before remarked, strangers should not attempt to enter this harbor.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING GUILFORD HARBOR.

I. *From the Eastward.*—On the W. by N. $\frac{1}{8}$ N. course from off Hammonasset Point, when Falkner's Island Light-house bears SW. by W. $\frac{1}{2}$ W., distant a mile and three-quarters, and Sachem's Head W. by N. $\frac{3}{4}$ N., distant three miles and three-quarters, steer NW. $\frac{1}{2}$ N., passing a little over half a mile to the westward of the red buoy on Charles' Reef; an eighth of a mile to the westward of Half-acre Island; and half a mile to the northeastward of Lobster Rock. Anchor according to draught, in from four to eight feet at low water.

DANGERS

IN APPROACHING AND ENTERING GUILFORD HARBOR.

II. *From the Eastward, to pass through the Inshore Channel.*—This channel is never used by vessels seeking a refuge, but only by those bound for the harbor. To enter it it is necessary, when off Hammonasset Point, to steer to the north-westward between Tuck's Island and Hoghead Point; and upon this course there will soon be seen, bearing about NW. by W. $\frac{1}{4}$ W., and three-quarters of a mile off, a red spar-buoy. This is on Madison East Reef, which lies a little over two miles and a half W. by N. $\frac{1}{4}$ N. from Hammonasset Point, and about five-eighths of a mile S. $\frac{3}{4}$ W. from Tuck's Island. It is a narrow shoal, lying nearly E. and W. and about a quarter of a mile long, and has twelve feet at low water, as reported by the pilots. The buoy, which is marked No. 4, is placed on its southern side in eighteen feet,—Falkner's Island Light-house bearing SW. $\frac{1}{2}$ W., distant three miles and three-eighths.

Abreast of this buoy the course turns to the westward, and another red spar-buoy will be seen to the southward, bearing about W. by S. and distant five-eighths of a mile. This is on the northern side of Madison Middle Reef, which extends NW. by W. and SE. by E. for three-eighths of a mile and has four feet at low water. The buoy is marked No. 6, and bears from the red buoy on Madison East Reef W. by N. $\frac{1}{4}$ N., about twelve hundred yards, and from Tuck's Island SW. $\frac{3}{8}$ W., seven-eighths of a mile distant. There should be a buoy on each end of this reef in place of the present buoy, which is about midway of its length, and such change will be recommended.

To the westward of Madison Middle Reef none of the dangers are buoyed and the passage can only be used by navigators who are local pilots.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING GUILFORD HARBOR.

II. *From the Eastward, to pass through the Inshore Channel.*—On the course W. Northerly through the North Channel of Long Island Sound, when Hammonasset Point bears N. $\frac{1}{4}$ W., distant a mile and three-eighths, and Falkner's Island Light-house is ahead, five miles distant, steer NW. which course will lead about midway between Tuck's Island and Hoghead Point. When past the red buoy on Madison East Reef and Falkner's Island Light-house bears SW. $\frac{1}{4}$ W. and Tuck's Island

N. $\frac{3}{4}$ E., steer **W. $\frac{1}{2}$ N.**, passing to the northward of Madison East and Middle reefs and Charles' Reef. Continue this course until within seven-eighths of a mile of Mulberry Point, with Falkner's Island Light-house bearing **S. $\frac{1}{2}$ W.**, distant two miles and a half, when **NW. $\frac{1}{2}$ N.** will lead to the anchorage.

The above courses pass three-quarters of a mile to the westward of the red buoy on Hammonasset Point Reef; four hundred yards to the eastward, and a quarter of a mile to the northward, of the red buoy on Madison East Reef; three hundred yards to the northward of the red buoy on Madison Middle Reef; nearly half a mile to the southward of Tuck's Island; a quarter of a mile to the northward of the northern end of Charles' Reef, and half a mile to the northward of the red buoy on the southwestern end of that reef; one hundred and fifty yards to the northward of Half-acre Island; and half a mile to the eastward of Lobster Rock.

DANGERS

IN APPROACHING AND ENTERING GUILFORD HARBOR.

III. *From the Westward.*—In approaching Guilford Harbor from the westward there are two channels,—neither of which, however, is fit for strangers. Vessels bound for Guilford through the Main Channel bring Falkner's Island Light-house to bear **E. $\frac{3}{4}$ S.**, distant three miles and three-quarters, and the hotel on Sachem's Head **NE.**, distant two miles and five-eighths, and steer **NE. by E. $\frac{1}{2}$ E.** On this course the first danger met with lies well to the northward, bearing about **NNE.** and three-quarters of a mile off. This is Chimney-Corner Reef, a detached shoal, with thirteen feet at low water, lying about six hundred and fifty yards to the southwestward of Sachem's Head,—the hotel bearing **NE. by N.** There is a good channel both north and south of the reef with from four to five fathoms; but the usual course passes to the southward of it.

Three-quarters of a mile to the westward of Chimney-Corner Reef lie the *Goose Rocks*, a rocky reef composed of dangerous bare and sunken rocks, off the southwestern end of which is placed a red spar-buoy (No. 10). This buoy formerly marked the position of Chimney-Corner Reef.

One mile **E. by S. $\frac{1}{2}$ S.** from Sachem's Head, and on the eastern side of the channel, lies a *six feet rock* which is not buoyed. It is nine hundred yards from the northern shore and bears from Mulberry Point **SW. by S. $\frac{1}{4}$ S.**, seven-eighths of a mile, and from Falkner's Island Light-house **NW. by N. $\frac{1}{2}$ N.**, two miles and an eighth distant. The sailing-line passes three hundred and fifty yards to the northward of this rock; but it requires the assistance of a local pilot to avoid it.

When past Sachem's Head and steering to the northeastward you must look out, on the eastern side of the channel, for Indian Reef, a dangerous rocky shoal, lying **NE. by E.** and **SW. by W.** and about half a mile long. Within its area are included many bare rocks, especially near its northeastern end; and, where the rocks are not bare, the soundings vary from three to six feet at low water. The sailing-line passes to the northward of this reef, but strangers must not attempt this passage. A red spar-buoy (No. 6) is placed in twenty-one feet water off the southwestern end of Indian Reef.

The southern extremity of Indian Reef, which has three feet, bears from Falkner's Island Light-house **NNW.**, about two miles and an eighth; from the southern extremity of Sachem's Head **E. $\frac{5}{8}$ S.**, a mile and a quarter; and from Chimney-Corner Reef **E. $\frac{1}{4}$ N.**, a mile and a half distant.

When up with Indian Reef look out, on the northern side of the channel, for the *rocks off Mulberry Point*, of which there are a great number,—most of them bare at low water and none of them buoyed. To avoid them give Mulberry Point a berth to the northward of not less than a quarter of a mile.

When between Mulberry Point and the northeastern end of Indian Reef, Lobster Rock will be seen about a quarter of a mile to the eastward and on the southern side of the channel. When nearly abreast of it, and about two hundred and fifty yards from it, Mulberry Point will bear **NW. by W.**, and the course turns abruptly to the northward towards the mouth of the small stream leading to the town of Guilford. Not more than two feet at low water can be taken to the mouth of this stream and not more than seven feet beyond Lobster Rock. The channel cannot be used by strangers.

On the eastern side of the channel, almost directly opposite Mulberry Point, will be seen a red spar-buoy (No. 2). This is in twelve feet water on the northwestern extremity of the reef making to the northward from Lobster Rock. Vessels must pass to the westward of it.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING GUILFORD HARBOR.

III. *From the Westward.*—1. *By the passage north of Indian Reef.*—On the **E. by S. $\frac{1}{4}$ S.** course through the North Channel of Long Island Sound, when just past Sachem's Head, with the hotel bearing **N. by W.** and Falkner's Island Light-house **SE. $\frac{1}{4}$ E.**, the depth will be six fathoms

Sailing Direc- and **NE.** by **E.** $\frac{1}{2}$ **E.** will lead, with not less than thirteen feet, between Mulberry Point **tions---** **Guil-** and Indian Reef. On this course, when Falkner's Island Light-house bears **S.** by **E.** **ford Harbor.** Southerly and you are within two hundred and fifty yards of Lobster Rock, steer **N.** $\frac{1}{2}$ **E.** and anchor in from five to seven feet on the eastern side of Mulberry Point.

The above courses pass three hundred and fifty yards to the southward of Chimney-Corner Reef; four hundred yards to the northwestward of the southwestern end of Indian Reef; a quarter of a mile to the southward of Mulberry Point; two hundred and fifty yards to the northward of the northeastern end of Indian Reef; and an eighth of a mile to the northward of Lobster Rock.

Or, on the E. by **N.** $\frac{1}{8}$ **N.** course from off Stratford Point, bring Falkner's Island Light-house to bear **E.** $\frac{3}{4}$ **S.**, distant three miles and three-quarters, and the hotel on Sachem's Head **NE.**, distant two miles and five-eighths, and steer **NE.** by **E.** $\frac{1}{2}$ **E.**, which will lead through the channel north of Indian Reef; the directions for which, given above, must then be followed.

This course passes nine hundred yards to the southward of Chimney-Corner Reef and three hundred and fifty yards to the northward of the "six feet rock" to the southwestward of Indian Reef.

2. Having come through the North Channel of Long Island Sound, to enter Guilford Harbor by the principal passage between Half-acre Island and Lobster Rock.—On the course **E.** by **S.** $\frac{1}{8}$ **S.** from off The Thimbles, when past Sachem's Head, with the hotel bearing **N.** by **W.** and Falkner's Island Light-house **SE.** $\frac{1}{4}$ **E.**, as before, steer **E.** $\frac{1}{4}$ **N.** until the light-house bears **S.** $\frac{3}{4}$ **E.** and Lobster Rock **N.** $\frac{3}{8}$ **W.**, when **NE.** by **N.** $\frac{1}{4}$ **N.** will lead to the entrance to the harbor. This course should be continued for about half a mile, or until Falkner's Island Light-house bears **S.** $\frac{1}{8}$ **W.**, when **N.** $\frac{1}{8}$ **E.** will lead to the anchorage. This channel is good for seven feet at low water.

The above courses pass three hundred and fifty yards to the southward of Chimney-Corner Reef; three hundred yards to the southward of the "six feet rock" southwest of Indian Reef; six hundred yards to the southward of the southwestern end of that reef; between eight and nine hundred yards to the eastward of its northeastern end; between six and seven hundred yards to the eastward of Lobster Rock; and three-eighths of a mile to the westward of Half-acre Island.

Or, on the E. by **N.** $\frac{1}{8}$ **N.** course from off Stratford Point, when Falkner's Island Light-house bears **E.** $\frac{3}{4}$ **S.**, distant three miles and three-quarters, and the hotel on Sachem's Head **NE.**, distant two miles and five-eighths, as before, steer **E.** by **N.** $\frac{3}{4}$ **N.** until Falkner's Island Light-house bears **S.** $\frac{3}{8}$ **E.** and Lobster Rock **N.** $\frac{3}{8}$ **W.**, when steer **NE.** by **N.** $\frac{1}{4}$ **N.** for about half a mile, or until the light-house bears **S.** $\frac{1}{8}$ **W.**, when steer **N.** $\frac{1}{8}$ **E.**, following the directions given above.

The above courses pass about seven-eighths of a mile to the southward of Chimney-Corner Reef; three-eighths of a mile to the southward of the "six feet rock" southwest of Indian Reef; the same distance to the southward of the southwestern end of that reef; and half a mile to the eastward of its northeastern end.

3. Having come through the North Channel of Long Island Sound, to pass to the Northward of Charles' Reef and anchor off Tuck's Island or Madison.—On the **E.** by **S.** $\frac{1}{8}$ **S.** course from off The Thimbles, when just past Sachem's Head, with the hotel bearing **N.** by **W.** and Falkner's Island Light-house **SE.** $\frac{1}{4}$ **E.**, as before, steer **E.** $\frac{1}{4}$ **N.** until Falkner's Island Light-house bears **S.** $\frac{3}{8}$ **E.** and Lobster Rock **N.** $\frac{3}{8}$ **W.**. Here the depth will be five and a half fathoms and **E.** by **N.** $\frac{3}{4}$ **N.** will lead, with not less than three and a quarter fathoms, to the northward of Charles' Reef and Madison Middle Reef. On this course Tuck's Island will be almost directly ahead but a little to the northward. *If bound to Madison:* When you come abreast of the red buoy on the southwestern end of Charles' Reef and Falkner's Island Light-house bears **SW.** by **S.** $\frac{3}{8}$ **S.**, the wharf at Madison will bear **NE.** by **E.**; and that course, if steered, will lead safely to the anchorage with not less than thirteen feet. *But wishing to anchor off Tuck's Island:* Continue the **E.** by **N.** $\frac{3}{4}$ **N.** course until nearly up with the red buoy on Madison Middle Reef,—Falkner's Island Light-house bearing **SW.** $\frac{3}{4}$ **S.**. Here the depth will be three and a half fathoms, and **E.** $\frac{3}{8}$ **S.** will lead, with not less than that depth, to the anchorage between Tuck's Island and Madison East Reef; *or, if continued,* will lead, with not less than fifteen feet, to the anchorage off Hammonasset Point.

The above courses pass three hundred and fifty yards to the southward of Chimney-Corner Reef; the same distance to the southward of the "six feet rock" to the southwestward of Indian Reef; about six hundred yards to the southward of the southwestern end of Indian Reef; half a mile to the south-

ward of Half-acre Island; three hundred yards to the southward of the "nine feet rock" on the southern edge of Guilford Shoals; about six hundred yards to the northward of the red buoy on the southwestern end of Charles' Reef; four hundred yards to the northward of the northern end of that reef; a quarter of a mile to the northward of the red buoy on Madison Middle Reef; six hundred yards to the northward of the red buoy on Madison East Reef; three-eighths of a mile to the southward of Tuck's Island; and three hundred yards to the southward of the "three feet rock" lying half a mile **SE.** by **E.** from that island.

Or, on the E. by N. $\frac{1}{8}$ N. course from off Stratford Point, when Falkner's Island Light-house bears **E. $\frac{3}{4}$ S.**, distant three miles and three-quarters, and the hotel on Sachem's Head **NE.**, distant two miles and five-eighths, steer **E. by N. $\frac{3}{4}$ N.** and follow the directions previously given, according as you are bound to Guilford, Madison, or to the anchorage under Hammonasset Point.

This course passes more than three-quarters of a mile to the southward of Chimney-Corner Reef; three-eighths of a mile to the southward of the "six feet rock" southwest of Indian Reef; and eight hundred yards to the southward of the reef itself.

4. To pass to the Southward of Charles' Reef and enter the anchorage under Hammonasset Point.—Continue the **E. by N. $\frac{1}{8}$ N.** course from off Stratford Point until Falkner's Island Light-house bears **E. $\frac{3}{4}$ S.**, distant three miles and three-quarters, and the hotel on Sachem's Head **NE.**, distant two miles and five-eighths; when alter the course slightly to the southward—steering about **E. by N.**—in order to give the southern edge of Charles' Reef and Madison East Reef a sufficient berth. Continue the course, and anchor at discretion in from two to three fathoms, sandy bottom. This passage is safe for strangers.

This course passes a mile to the southward of Chimney-Corner Reef; three-quarters of a mile to the southward of the "six feet rock" southwest of Indian Reef; the same distance to the northward of Goose Island Ledges; seven-eighths of a mile to the southward of Indian Reef; three-quarters of a mile to the northward of the black spar-buoy on the northern end of Falkner's Island Reef; about the same distance to the southward of Guilford Shoals; eight hundred yards to the southward of the red buoy on the southwestern end of Charles' Reef, and six hundred yards to the southward of its southern end; about nine hundred yards to the southward of Madison Middle Reef; and nearly six hundred yards to the southward of the red buoy on Madison East Reef.

There is anchorage for small vessels in the cove west of Mulberry Point; but it is very shallow, full of rocks, and strangers must not attempt it.

SACHEM'S HEAD HARBOR.

This harbor, as before mentioned on page 355, is formed by a small cove of irregular shape, embraced between Sachem's Head and Joshua's Point, and is good for from six to twelve feet at low water. The cove is a little over a quarter of a mile long in an **ENE.** and **WSW.** direction, with a width at its mouth of a little over two hundred yards. It is comparatively easy of access and may be safely approached by following the directions.

Sachem's Head, the southern point of entrance, is a rocky point with a smooth gently sloping surface, and for the most part cleared, but in some places fringed with a thin growth of trees and in others having small clumps of trees during the surface. At its southwestern end it is almost barren.—the surface being covered with bare out-cropping ledges. There is a hotel about a quarter of a mile back from the shore; and around this (in 1874) a cluster of houses had collected. The head is shoal in its approaches and should receive a berth to the northward of not less than eight hundred yards. **Sachem's Head.**

Joshua's Point, the northern side of the entrance, is about forty feet high, has a very gentle slope and grassy surface except on its northern side, where there is a thin fringe of trees. On its southern and western sides it is faced with steep bare rocks.

About twenty-five yards from the western extremity of Sachem's Head (with which it is connected at low water) is an islet about a hundred yards long lying nearly **N. by E.** and **S. by W.** It is a mere mass of bare rock and is not named. Several small islets lie off the southern side of the head, surrounded by ledges dry at low water, which render the approach to the head from this direction dangerous.

Fifty yards to the westward of Joshua's Point lies another bare rocky islet, about seventy-five yards in diameter; and between five and six hundred yards **SW. by W.** from the point lie two large bare rocks, called the **Goose Rocks.** They are about **NE.** and **SW.** from each other, about a hundred yards apart, and are surrounded by shoal water. A red spar-buoy has been placed on the southwestern edge of the shoals making off from these rocks.

DANGERS

IN APPROACHING AND ENTERING SACHEM'S HEAD HARBOR.

Having come through the North Channel of Long Island Sound and wishing to enter this harbor, you will, if from the eastward, first meet with Chimney-Corner Reef; and, if from the westward, with Goose Rock Shoals. Chimney-Corner Reef has thirteen feet at mean low water and is, therefore, not dangerous to vessels seeking a refuge in this harbor except in heavy weather. It lies about six hundred and fifty yards to the southwestward of Sachem's Head—the hotel bearing **NE.** by **N.**—and there is equally good water on both sides of it. This reef bears from Falkner's Island Light-house **NW. $\frac{3}{4}$ W.**, distant nearly three miles, and from it Joshua's Point bears **N. $\frac{3}{4}$ W.**, distant about eleven hundred yards.

Goose Rock Shoals is the name given to the shoal water surrounding the Goose Rocks, and which extends to the southward from the easternmost rock for over three hundred yards, and to the southwestward from the westernmost rock for nearly a quarter of a mile. To the southward of the rocks the soundings vary from six to twelve feet; but to the southwestward the approach is more dangerous, as there is a *rock, bare at low water*, three hundred and fifty yards **SW.** by **W. $\frac{1}{2}$ W.** from the westernmost rock. It is best, therefore, for strangers coming into the harbor to give the westernmost rock a berth to the northward of not less than a quarter of a mile; and the easternmost rock a berth to the westward of not less than four hundred and fifty yards. The red spar-buoy (No. 10), which formerly marked the southern side of Chimney-Corner Reef, was removed and placed on the southwestern end of Goose Rock Shoals, near a *three feet rock*. As both shoals should be marked, it will be recommended that a buoy be placed on the former danger as early as possible.

In coming in from the eastward the small islet to the southward of Sachem's Head should receive a berth to the eastward of not less than three hundred and fifty yards to avoid a *dangerous ledge making off from it* in a **W SW.** direction for an eighth of a mile. For half that distance the ledge is bare at low water, and five feet is found on its western extremity at a distance of over two hundred yards from the island. This ledge is not buoyed, and to avoid it vessels should be careful not to go to the eastward of the western extremity of Joshua's Point bearing **N.** by **W. $\frac{3}{4}$ W.**

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING SACHEM'S HEAD HARBOR.

I. From the Eastward.—1. Wishing to pass to the Eastward of Chimney-Corner Reef.—

Having come through the North Channel of Long Island Sound, continue the **W.** by **N. $\frac{1}{2}$ N.** course from off Hammonasset Point until Falkner's Island Light-house bears **SE. $\frac{1}{4}$ E.**, when steer **NW. $\frac{1}{4}$ W.** for about three-quarters of a mile (having the Goose Rocks just open to the westward of the course) and carrying not less than four fathoms water. When within about three-eighths of a mile of the easternmost Goose Rock, the hotel on Sachem's Head will bear **NE. $\frac{3}{4}$ E.**, distant about nine hundred yards, and the western extremity of Joshua's Point **N. $\frac{3}{4}$ W.**, distant about three-eighths of a mile. Now steer **N.** for about a quarter of a mile until the harbor is fairly open, with the hotel bearing **E. $\frac{1}{4}$ N.** and the easternmost Goose Rock **W. $\frac{3}{4}$ S.**, when **ENE.** will lead safely to the anchorage. There was formerly a buoy off the mouth of the harbor, painted white and black in perpendicular stripes, and its restoration to its old position will be recommended.

The above courses pass two hundred yards to the eastward of Chimney-Corner Reef; one hundred and fifty yards to the westward of the "five feet rock" south of Sachem's Head; and about four hundred yards to the eastward of the eastern extremity of Goose Rock Shoals.

2. To pass to the Westward of Chimney-Corner Reef.—On the **W.** by **N. $\frac{1}{2}$ N.** course through the North Channel of Long Island Sound, when the hotel on Sachem's Head bears **NE.** by **N. $\frac{1}{4}$ N.** and Falkner's Island Light-house **SE. $\frac{3}{4}$ E.**, you will be abreast of Chimney-Corner Reef and must steer **N. $\frac{1}{2}$ W.** for about half a mile, carrying not less than sixteen feet, until the hotel bears **E.** by **N.** when **ENE.** will lead safely to the anchorage. The holding-ground is good in from nine to twelve feet and the shelter perfect.

The above courses pass an eighth of a mile to the westward of Chimney-Corner Reef; over three hundred yards to the westward of the "five feet rock" south of Sachem's Head; and a quarter of a mile to the eastward of the eastern extremity of Goose Rock Shoals.

II. From the Westward.—1. Having come through the North Channel of Long Island Sound, to enter Sachem's Head Harbor.—On the **E.** by **S. $\frac{1}{2}$ S.** course from off The Thimbles, when Falk-

ner's Island Light-house bears **SE.** by **E.** and the hotel on Sachem's Head **NE.** $\frac{3}{4}$ **E.**, about seven-eighths of a mile distant, steer for the latter until Joshua's Point bears **N.** $\frac{3}{4}$ **W.**, about three-eighths of a mile distant, and Falkner's Island Light-house **SE.** $\frac{1}{4}$ **E.** Now steer **N.** for about a quarter of a mile until the harbor is fairly open, with the hotel bearing **E.** $\frac{3}{4}$ **N.** and the easternmost Goose Rock **W.** $\frac{3}{4}$ **S.**, when **E NE.** will lead safely to the anchorage.

Sailing Directions --- Sachem's Head Harbor.

The above courses pass three hundred and fifty yards to the southward of the bare rock on the southwestern end of Goose Rock Shoals; about the same distance to the westward of Chimney-Corner Reef; three hundred and fifty yards to the westward of the "five feet rock" to the southward of Sachem's Head; and four hundred and fifty yards to the eastward of the eastern edge of Goose Rock Shoals.

2. Or, on the course **E.** by **N.** $\frac{1}{2}$ **N.** from off Stratford Point, when Falkner's Island Light-house bears **E.** $\frac{3}{4}$ **S.**, distant four miles and three-quarters, and Branford Reef Beacon **NW.** by **W.**, distant about two miles and three-eighths, steer **NE.** $\frac{3}{4}$ **E.**, which will lead directly towards the hotel on Sachem's Head. Continue this course until you bring Joshua's Point to bear **N.** $\frac{3}{4}$ **W.**, distant three-eighths of a mile, and Falkner's Island Light-house **SE.** $\frac{1}{4}$ **E.**, when steer **N.** and follow the directions given above.

There are numerous anchorages in the bight and among the islands between Sachem's Head and Jeffrey's Point, which are entered occasionally by coasters and others who are familiar with their dangers. General directions for each of these will be found on pages 400-401, but strangers should not attempt to enter them.

BRANFORD HARBOR.

This harbor, as before mentioned on page 357, is formed by a large but shallow cove, which receives the waters of a narrow and crooked stream called Branford Creek. The cove is of irregular shape, about a mile long **N.** by **E.** and **S.** by **W.**, has an average width of about three-eighths of a mile, and anchorage for small vessels in from six to thirteen feet at low water. It is, however, much obstructed by ledges and sunken rocks and is not a suitable refuge for strangers. The entrance is between Jeffrey's Point on the east and Branford Point on the west and is more than three-quarters of a mile wide.

Jeffrey's Point, sometimes called **Indian Point**, is low, flat and rocky, entirely bare, but backed by thick woods, with a number of large white houses appearing here and there. To the southeastward of it lie several small islands,—the principal of which are **Spectacle, Flag, Squaw** and **Ball** islands, all of which are rocky, some of them bare and some dotted with low bushes and trees. Branford Point is bare and composed of a yellowish-white rock, backed by thick woods alternating with cultivated fields. It should not be approached from the southwestward nearer than half a mile, as long and dangerous shoals make off from it in that direction for nearly eight hundred yards.

Jeffrey's and Branford Points.

Two rocky islets lie in the middle of the entrance to Branford Harbor, very much obstructing the approach, and are known respectively as **Taunton Rock** and **Blyn Rock**. The former, which is the easternmost and largest, lies between five and six hundred yards **W.** by **S.** $\frac{1}{2}$ **S.** from Jeffrey's Point and is a little over one hundred yards long in a **N.** and **S.** direction. There is good water on all sides of it, but the main channel from the eastward passes between the rock and Jeffrey's Point. Blyn Rock is four hundred yards to the westward of Taunton Rock and bears from Branford Point **SE.** by **E.** $\frac{3}{4}$ **E.**, distant about a quarter of a mile. It is about thirty yards in diameter, and there is a fifteen feet channel between it and Taunton Rock and one with thirteen feet between it and Branford Point. The latter is used by vessels from the westward.

Taunton and Blyn Rocks.

The eastern shore of Branford Harbor is formed by Indian Neck, a peninsula of irregular shape lying nearly **E.** and **W.**, and joined to the mainland about a mile to the eastward of Jeffrey's Point. It presents, when seen from the harbor, alternate cleared, cultivated and settled lands and marsh, dotted with occasional clumps of trees. It is faced with rocks, which in many cases extend out so as to form reefs,—this being notably the case in the vicinity of Jeffrey's Point. The western face of the neck, which forms the eastern shore of the harbor, is very irregular in outline. Half a mile to the northward of Jeffrey's Point it extends out into a long level point, cleared and cultivated, with several houses upon it, and faced with rocks. The jutting out of this point contracts the width of the harbor to a little over six hundred yards with a depth of from six to seven feet at low water. From this point the shore takes a sudden and abrupt turn to the eastward, running due **NE.** for about six hundred yards to the entrance to Branford Creek, which is here about a hundred and twenty-five yards wide.

Indian Neck.

The western shore of the harbor, from Branford Point to the head of the cove, has a general course about **NE.** by **N.** and is composed of alternate cleared and cultivated lands and groves of trees. The shore-line, though not so irregular in outline as the eastern shore, is indented by numerous small coves,—the shores of which are for the most part fringed with marsh, though the general character is rocky.

At the head of the cove the shore turns to the eastward and has a general course about **E SE.** (though much indented) for three-eighths of a mile to the entrance to **Branford Creek**, where a long rocky point extends to the southward towards the northern point of Indian Neck, diminishing the width of the entrance to about one hundred and twenty-five yards. The course of the creek from its mouth to **Branford** is very tortuous, with an average width of the channel of about one hundred yards, and the village is situated on its northern bank, about a mile and a half above its mouth. The shores are low and composed of alternate fast lands, which are cleared and cultivated, and marsh, which is dotted at intervals with clumps of trees.

DANGERS

IN APPROACHING AND ENTERING BRANFORD HARBOR FROM THE EASTWARD.

I. Having come through the Thimbles Channel.—When between Inner Reef and Wheaton's Reef, as before mentioned on page 397, the course for the entrance to New Haven is **W. $\frac{1}{2}$ S.**; and on this course there will soon be seen, a little to the northward, bearing about **W. $\frac{3}{4}$ N.**, and distant five-eighths of a mile, a red spar-buoy; while well to the southward of the course, bearing about **SW. $\frac{3}{4}$ W.**, and distant a mile and a quarter, will be seen a grey stone tower surmounted by an iron spindle.

The buoy is on The Negro Heads, a mass of boulders, bare at low tides and surrounded by shoal water, which extends to the northward for about three hundred and fifty yards and to the southward two hundred and fifty,—making the entire length of the shoal six hundred yards. The dry rocks lie

The Negro Heads.

about eight hundred yards to the southward of Ball Island, (see page 357,) and between the two there is a passage with from two to four fathoms. The buoy is placed in three fathoms on the southern end of the shoal, is marked No. 16, and bears from the eastern extremity of Ball Island **S. Westerly**, five-eighths of a mile; from Inner Reef buoy **W. $\frac{1}{8}$ S.**, a mile and a half; and from Wheaton's Reef buoy **W. $\frac{3}{4}$ N.**, a little over a mile and three-eighths distant. From this buoy the red buoy on Five Feet Rock bears **W. by N. $\frac{5}{8}$ N.**, a little over a mile and a quarter; Jeffry's Point **NW. Northerly**, one mile; and Taunton Rock **NW. by W. Westerly**, a mile and an eighth distant.

The stone beacon seen well to the southward of the course is on Branford Reef, a detached shoal lying about a mile and five-eighths to the southward of Jeffry's Point, and extending **Branford Reef. N. by E.** and **S. by W.** for about six hundred yards with a depth of from six to eighteen feet. The shoal part of the reef, which has six feet, is a little over one hundred yards long by one hundred and fifty wide, and the beacon is placed near its western edge. It is called **Branford Reef Beacon**, and is built of grey stone, cylindrical in shape, surmounted by an iron shaft and ball, and bears from

	Miles.
Inner Reef buoy, SW. by W. $\frac{1}{2}$ W. -----	about 2
Wheaton's Reef buoy, W. by S. $\frac{3}{4}$ S. -----	1 $\frac{3}{4}$
Falkner's Island Light-house, W. by N. $\frac{1}{4}$ N. -----	6 $\frac{1}{2}$
Sachem's Head, W. $\frac{1}{2}$ S. -----	nearly 4 $\frac{1}{2}$
The Outer Thimble, W. by S. $\frac{3}{4}$ S. -----	2 $\frac{3}{8}$

From this beacon the buoy on The Negro Heads bears **N. by E. $\frac{1}{2}$ E.**, nearly one mile; Jeffry's Point **N. by W. $\frac{1}{8}$ W.**, a mile and five-eighths; and the buoy on Five Feet Rock **NW. $\frac{3}{4}$ N.**, a mile and five-eighths distant.

When past the buoy on The Negro Heads the course turns to the northward and a red spar-buoy will soon appear well to the westward, bearing about **NW. by W. $\frac{1}{2}$ W.** and three-quarters of a mile off. This is on Five Feet Rock, a small detached rock, with five feet at low water, lying about five-eighths of a mile to the southwestward of Jeffry's Point and half a mile to the southward of Branford Point. The buoy is marked and colored for the North Channel of Long Island Sound.

Five Feet Rock. and, notwithstanding its color, must be left to the westward by vessels entering Branford by this channel. It is numbered 18, placed in fifteen feet close to the rock, and bears from the buoy on The Negro Heads **W. by N. $\frac{5}{8}$ N.**, a little over a mile and a quarter, and from Branford Reef Beacon **NW. $\frac{3}{4}$ N.**, five miles and three-eighths distant. From this buoy Jeffry's Point bears **NE. by E. $\frac{1}{2}$ E.**, a little over five-eighths of a mile; Branford Point **N. by W. $\frac{3}{4}$ W.**, a little over half a mile; and Taunton Rock **NE. $\frac{1}{2}$ E.**, three-eighths of a mile distant. The sailing-line of this channel passes half a mile to the eastward of the buoy.

In beating in through this channel be careful not to stand farther to the eastward than to bring Jeffry's Point to bear **NW. by N.**; by which means a dangerous ledge, called *Ball Island Ledge*, will be avoided. There is only two feet on the western extremity of this ledge, which makes off from Ball Island in a **W SW.** direction for a quarter of a mile, and, as it is not buoyed, vessels must carefully watch the bearings in order to avoid it.

Spectacle Islands are bold-to on their western side and may be safely approached within one hundred and fifty yards with not less than four fathoms. But Jeffry's Point should receive a berth to the eastward of not less than three hundred yards to avoid the long ledge, bare at low water, which makes off about **S SE.** from the point for nearly two hundred yards. This ledge is bold-to, and at low water you may pass quite close to it with not less than three fathoms.

Taunton Rock is bold-to and fifteen feet may be taken within fifty yards of it. The channel between it and Jeffrey's Point is not less than a quarter of a mile wide. Blyn Rock may also be approached within one hundred and fifty yards with not less than fifteen feet at low water.

When past Taunton Rock look out, on the western side of the channel, for Bird Reef, which is marked by a red spar-buoy (No. 2). This is a small detached rock, with five feet at low water, lying about three hundred yards to the northward of Blyn Rock and about six hundred yards to the eastward of Branford Point. There is equally good water on all sides of *Bird Reef.* it, but vessels using this channel leave it to the westward. The buoy is in ten feet at low water, on the eastern end of the shoal, and bears from Jeffrey's Point **NW.** by **W.** $\frac{1}{4}$ **W.**, half a mile; from the northern end of Taunton Rock **NW.** by **N.** $\frac{3}{8}$ **N.**, six hundred yards; and from Blyn Rock **NNE.**, three hundred and fifty yards distant.

When past the buoy on Bird Reef the first dangers met with are two bare rocks known as The Mermaids. They lie about midway of the harbor, a little over half a mile to the northward of Taunton Rock and abreast of the long rocky point previously mentioned as making out from the western shore of Indian Neck. These two rocks lie about **N.** by **W.** *The Mermaids.* and **S.** by **E.** from each other and about one hundred yards apart, and the channel passes to the eastward of them with from six to eight feet at low water. Beyond these rocks an intelligible description of the dangers cannot be given, nor can any one pass beyond them without a pilot.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING BRANFORD HARBOR FROM THE EASTWARD.

I. *Having come through the Thimbles Channel.*—On the **W.** $\frac{1}{2}$ **S.** course from between Inner and Wheaton's reefs, when Branford Reef Beacon bears **S.** $\frac{7}{8}$ **E.** and Southwest Ledge Light-house **W.** by **N.**,—the former being distant seven-eighths of a mile and the latter about four miles and a half,—you will have four and a half fathoms and **NNW.** will lead safely into the harbor. On this course you will not have less than three fathoms until past Taunton Rock, and from thence to abreast of The Mermaids the decrease in the depth is exceedingly gradual and regular. Anchor on this course according to draught. *Or, wishing to enter Branford Creek,* when the southern extremity of Branford Point bears **W.**, about half a mile off, and the western extremity of the long point making off from Indian Neck **NNE.**, six hundred yards distant, steer **N.** $\frac{1}{4}$ **E.**, which course will lead, with not less than seven feet, midway between this long point and the southernmost of The Mermaids. Beyond this it is not safe to go without a pilot.

While to the southward of The Mermaids and above Bird Reef you may anchor under either shore of the harbor, as there is nothing in the way.

The above courses pass one hundred and fifty yards to the southward of the buoy on The Negro Heads; three-quarters of a mile to the northward of Branford Reef Beacon; about six hundred yards to the westward of Ball Island Ledge; half a mile to the eastward of the red buoy on Five Feet Rock; four hundred yards to the westward of the rocky point on the western end of Spectacle Island; an eighth of a mile to the westward of the rocky ledge south of Indian Point; about the same distance to the eastward of Taunton Rock; four hundred yards to the westward of Indian Point; about a quarter of a mile to the eastward of Blyn Rock; three hundred yards to the eastward of the red buoy on Bird Reef; and a little over one hundred yards to the eastward of the southernmost of The Mermaids.

DANGERS

IN APPROACHING AND ENTERING BRANFORD HARBOR FROM THE EASTWARD.

II. *Having come through the North Channel of Long Island Sound.*—Vessels entering from the main passage of the North Channel, when, on the **W.** by **S.** $\frac{1}{8}$ **S.** course, they bring Falkner's Island Light-house to bear **E.** $\frac{3}{4}$ **S.** and The Outer Thimble **NW.** by **N.** $\frac{1}{4}$ **N.**, should steer to the northward, (**NW.** by **W.** $\frac{1}{2}$ **W.**), aiming to pass about half a mile to the eastward of Branford Reef Beacon. On this course there will soon be seen to the northward, bearing about **NW.** by **N.** $\frac{3}{4}$ **N.** and three-quarters of a mile off, a red spar-buoy. This is on East Ledge, a detached shoal with six feet at low water and from four to seven fathoms on all sides *East Ledge.* of it. The ledge lies **NNE.** and **SSW.** and is about three hundred and fifty yards long. The buoy, which is marked No. 12, is placed in three fathoms off its southern end, and bears from Falkner's Island Light-house **W.** by **N.** $\frac{3}{4}$ **N.**, distant five miles and an eighth. From this buoy Branford Reef Beacon bears **W.** $\frac{1}{4}$ **S.**, distant one mile and three-quarters; the red buoy on The Negro Heads **NW.** by **W.** $\frac{1}{2}$ **W.**, one mile and five-eighths; and the red buoy on Five Feet Rock **WNW.** Northerly, distant nearly three miles.

The course passes about midway between East Ledge and *Branford Reef*,—the beacon on which will be easily recognized as a round tower of grey stone, surmounted by an iron shaft and ball. It bears from Falkner's Island Light-house **W.** by **N.** $\frac{1}{4}$ **N.**, nearly seven miles; and from it the buoy on The Negro Heads bears **N.** by **E.** $\frac{3}{4}$ **E.**, nearly a mile, and the red buoy on Five Feet Rock **NW.** $\frac{1}{4}$ **N.**, a mile and five-eighths distant. (For description of Branford Reef see page 442.)

When abreast of Branford Reef Beacon the red buoy on The Negro Heads will bear nearly **N.**, distant three-eighths of a mile. These ledges have already been described, in the approaches by the Thimbles Channel, as a mass of boulders, bare at low tides and surrounded by shoal water, forming the southernmost of the shoals to the southeastward of Jeffry's Point. (See page 442.)

The Negro Heads. The buoy is marked No. 16, placed off the southern end of the shoal, and bears from East Ledge buoy **NW.** by **W.** $\frac{1}{2}$ **W.**, a mile and five-eighths, and from Branford Reef Beacon **N.** by **E.** $\frac{1}{2}$ **E.**, nearly a mile distant. From this buoy the western extremity of Ball Island bears **N.** by **W.** $\frac{3}{4}$ **W.**, half a mile; the buoy on Five Feet Rock **W.** by **N.** $\frac{1}{4}$ **N.**, a little over a mile and a quarter; and Jeffry's Point (in range with the western end of The Spectacles) **NW.** $\frac{1}{8}$ **N.**, one mile distant.

When past The Negro Heads the dangers are the same, and are met with in the same order, as when approaching from the Thimbles Channels. (See pages 442-443.)

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING BRANFORD HARBOR FROM THE EASTWARD.

II. Having come through the North Channel of Long Island Sound.—On the course **W.** by **S.** $\frac{1}{8}$ **S.** from abreast of Falkner's Island, when Falkner's Island Light-house bears **E.** $\frac{3}{4}$ **S.**, Branford Reef Beacon **W.** by **N.** $\frac{3}{8}$ **N.**, and The Outer Thimble **NW.** by **N.** $\frac{1}{4}$ **N.**, the depth will be six and a half fathoms, and **NW.** by **W.** $\frac{1}{4}$ **W.** will lead safely between East Ledge and Branford Reef with not less than six fathoms. On this course, when past The Negro Heads and Branford Reef Beacon bears **S.** $\frac{7}{8}$ **E.**, distant seven-eighths of a mile, and Southwest Ledge Light-house **W.** by **N.**, distant four miles and a half, you will have four and a half fathoms and **NNW.** will lead safely into the harbor, following the directions given on page 443.

The above courses pass eight hundred yards to the southwestward of the red buoy on East Ledge; more than half a mile to the northeastward of Branford Reef Beacon; and six hundred and fifty yards to the southward and half a mile to the westward of the buoy on The Negro Heads.

DANGERS

IN APPROACHING AND ENTERING BRANFORD HARBOR FROM THE WESTWARD.

III. Having come from New Haven,—entering between Blyn Rock and Branford Point and to the Westward of Bird Reef.—Vessels from New Haven steer **E.**, from off the entrance, until nearly abreast of Branford Point, with Southwest Ledge Light-house bearing **W.** by **N.** $\frac{1}{4}$ **N.**, Branford Point **NE.** by **N.** $\frac{1}{2}$ **N.**, and Branford Reef Beacon **SE.** by **E.** $\frac{3}{4}$ **E.**, when they steer **NE.** $\frac{1}{4}$ **N.**

The Cow and Calf. On this course the first danger met with will be seen a little to the westward, bearing about **NE.** by **N.** $\frac{1}{2}$ **N.**, and half a mile distant. It is formed by two small bare rocks called The Cow and Calf, surrounded by shoal water, and having a detached twelve feet spot a little to the westward of them. They are not buoyed, but are always visible and therefore easily avoided. They bear from Southwest Ledge Light-house **E.** $\frac{3}{4}$ **S.**, about three miles and a quarter, and from Branford Reef Beacon **NW.** **Westerly**, a mile and seven-eighths distant. Branford Point is about five-eighths of a mile **NW.** by **N.** $\frac{1}{2}$ **N.** from them; Blyn Rock nearly three-quarters of a mile **NE.** $\frac{3}{4}$ **E.**; Taunton Rock three-quarters of a mile **E.** by **N.** $\frac{1}{2}$ **N.**; and the buoy on Five Feet Rock nine hundred yards **E.** $\frac{1}{8}$ **N.** The course passes to the eastward of them and well to the westward of the last-named buoy.

Five Feet Rock has been already described on page 442 as a small detached rock with five feet at low water, lying about five-eighths of a mile to the southwestward of Jeffry's Point and marked by a red spar-buoy. This buoy, which is numbered 18 as a guide to Long Island Sound, bears from Southwest Ledge Light-house **E.** $\frac{1}{4}$ **S.**, nearly three miles and three-quarters; from The Cow and Calf **E.** $\frac{1}{8}$ **N.**, nine hundred yards; and from Branford Reef Beacon **NW.** $\frac{3}{4}$ **N.**, one mile and five-eighths distant. From this buoy Jeffry's Point bears **NE.** by **E.** $\frac{1}{2}$ **E.**, a little over five-eighths of a mile; Branford Point **N.** by **W.** $\frac{3}{4}$ **W.**, a little over half a mile; and Blyn Rock **N.** by **E.** $\frac{1}{8}$ **E.**, eight hundred yards distant.

When up with Blyn Rock give it a berth to the eastward of not less than one hundred yards; and when abreast of it you will see, well to the eastward of the course and about four hundred yards off, the red spar-buoy on Bird Reef. This shoal, already described on page 443, is a detached five

feet rock, about three hundred and fifty yards to the eastward of the western shore of the harbor and about the same distance to the northward of Blyn Rock. The buoy, which is incorrectly colored red, is marked No. 2, placed on the *eastern* side of the rock, and bears *Bird Reef* from Blyn Rock **NNE.**, three hundred and fifty yards, and from the southern extremity of Branford Point **E. $\frac{3}{4}$ N.**, about six hundred yards distant. From this buoy the southernmost of The Mermaids bears **NNE.**, a little over six hundred yards distant.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING BRANFORD HARBOR FROM THE WESTWARD.

III. Having come from New Haven,—entering between Blyn Rock and Branford Point and to the Westward of Bird Reef.—With Southwest Ledge Light-house bearing **NW. $\frac{3}{4}$ N.**, distant seven-eighths of a mile, and New Haven Tower **N.**, distant one mile and a half, steer **E.** On this course, when Southwest Ledge Light-house bears **W.** by **N. $\frac{1}{4}$ N.**, Branford Reef Beacon **SE.** by **E. $\frac{3}{4}$ E.**, and Branford Point **NE.** by **N. $\frac{1}{2}$ N.**, steer **NE. $\frac{3}{4}$ N.**, passing to the westward of Blyn Rock and Bird Reef. When abreast of the buoy on the latter, steer **NE. $\frac{3}{4}$ E.**, which course will lead about midway between The Mermaids and the long rocky point making out from Indian Neck. Beyond this point you must not go without a pilot.

Or, you may anchor on the **NE. $\frac{3}{4}$ N.** course, under the western shore, in from ten to twelve feet; *or*, on the **NE. $\frac{3}{4}$ E.** course, in from nine to ten feet, between Bird Reef and The Mermaids.

The above courses pass two hundred yards to the eastward of The Cow and Calf; between five and six hundred yards to the westward of the red buoy on Five Feet Rock; three-eighths of a mile to the westward of Taunton Rock; three hundred yards to the eastward of Branford Point; an eighth of a mile to the westward of Blyn Rock; about two hundred yards to the westward of the buoy on Bird Reef; and a little over one hundred yards to the eastward of the southernmost of The Mermaids.

IV. Or, to pass between Blyn Rock and Taunton Rock and to the Eastward of Bird Reef.—On the **E.** course from off New Haven Entrance, when Southwest Ledge Light-house bears **W.** by **N. $\frac{1}{2}$ N.**, Branford Reef Beacon **SE.** by **E. $\frac{3}{4}$ E.**, and Branford Point **NE.** by **N. $\frac{1}{2}$ N.**, as before, steer **NE.** Easterly, which course will lead, with not less than fifteen feet, between Blyn Rock and Taunton Rock. Continue the course, carrying not less than twelve feet, until the southern extremity of Branford Point bears **W.**, half a mile off, and the western end of the long point making off from Indian Neck **NNE.**, six hundred yards distant, when **N. $\frac{1}{4}$ E.** will lead midway between that point and The Mermaids with not less than seven feet at low water.

V. Or, on the E. by N. $\frac{1}{4}$ N. course from off Stratford Point. when Southwest Ledge Light-house bears **NW. $\frac{1}{2}$ N.**, distant two miles and a half, and Branford Reef Beacon **E. $\frac{5}{8}$ N.**, distant three miles, steer **NE.** Easterly, which course will lead, with not less than four and a half fathoms, into the Thimbles Channel. On this course, when Southwest Ledge Light-house bears **W.** by **N. $\frac{1}{2}$ N.**, Branford Reef Beacon **SE.** by **E. $\frac{3}{4}$ E.**, and Branford Point **NE.** by **N. $\frac{1}{2}$ N.**, as before, steer **NE. $\frac{3}{4}$ N.** if intending to pass to the westward of Blyn Rock; *or*, if intending to pass between Blyn and Taunton rocks, continue the course **NE. Easterly**,—following in each case the directions for these passages.

VI. Or, on the E. by N. $\frac{1}{8}$ N. course through the main passage of the North Channel, when off New Haven Entrance, with Southwest Ledge Light-house bearing **N.** by **E.**, distant four miles and a half, and the bluff on Pond Point **NW.**, a little over five miles distant, you will have ten fathoms, soft bottom, and **NE. Easterly** must be steered until Southwest Ledge Light-house bears **W.** by **N. $\frac{1}{2}$ N.**, as before; after which follow the directions given above.

NEW HAVEN HARBOR.

This harbor is situated about three miles and a half to the westward of Branford Harbor and is formed by the confluence of Mill and Quinnipiac rivers. Its eastern point of entrance, called Five Mile Point, is easily distinguished by the white tower on its western extremity, which was formerly occupied as a light-house, but was dismantled when Southwest Ledge Light-house was lighted. The tower stands in a clump of low scrub, near which there are several small houses. Back of this the land is thickly wooded with tall trees, between which and the scrub surrounding the tower is a narrow strip of cleared land, which, when seen from the southward and eastward, looks like a large "nick" in the woods. Five Mile Point is faced with bare rocks and there are several outlying rocks and islets off its southwestern extremity, so that vessels entering the harbor should give it a berth to the eastward of not less than three hundred and fifty yards.

The western point of entrance to New Haven Harbor is called **Clark's Point**, or **Oyster River Point**. It lies **W. $\frac{1}{4}$ S.** from Five Mile Point, and between the two the entrance is about three miles and a quarter wide, but for the most of this distance the water is shoal,—the available channel being only about three-quarters of a mile wide. The point is low and grassy at its southern extremity, but the land rises to the northward with a gentle slope to a wooded crest about forty feet

Clark's Point. high. Behind this the hills begin,—stretching in a line to the northward with a pretty nearly equal elevation and no especially remarkable feature except **West Rock**, which will appear as a precipitous yellow bluff with deeply furrowed faces to the southward projecting from the otherwise unbroken line of high lands. All along the western shore of the harbor, at the base of these hills, will be seen level cultivated lands thickly dotted with houses, forming the village of **West Haven**, and still farther to the northward the numerous houses and spires of the city of **New Haven**. On the eastern shore houses are thickly scattered from **South End** to Five Mile Point, and the line of distant hills is plainly seen above the low woods. Of these hills the most remarkable are **East Rock** and **Mount Carmel**,—the former a high precipitous bluff with yellow perpendicular faces and level summit crowned with low trees and bushes; and the latter being composed of two humps with a very peculiar depression or "nick" between them, rendering it perhaps the most remarkable of all the hills in this vicinity.

Besides these remarkable hills the most prominent object, and the first seen on approaching the harbor, is a one-story eight-sided house with mansard roof surmounted by a lantern. This is **Southwest Ledge Light-house**. The house, which is painted red, is supported upon a tubular foundation also painted red, and apparently standing in the water. It shows a fixed white light, of the fourth order, from a height of fifty-seven feet above the sea, visible thirteen miles. Its geographical position is

Latitude	41° 14' 2" N.
Longitude	72° 54' 45" W.,

and it bears from **Falkner's Island Light-house** **W. by N. $\frac{1}{2}$ N.**, about ten miles and three-quarters, and from **Horton's Point Light-house** **NW. by W. $\frac{1}{2}$ W.**, nearly twenty-three miles distant. From this light-house

Old Field Point Light-house bears SW. $\frac{1}{4}$ S. Southerly	nearly 18	Miles.
Middle Ground Light-house SW. $\frac{1}{2}$ W.	13 $\frac{1}{2}$	
Eaton's Neck Light-house SW. by W. $\frac{1}{2}$ W.	a little over 27	
Stratford Point Light-house W. by S. $\frac{1}{4}$ S.	nearly 10	

A bell is struck by machinery at intervals of fifteen seconds during thick weather.

The large iron spindle, surmounted by a cask placed horizontally, which is seen about half a mile to the eastward of the light-house is on **Quize's Ledge**; and well over towards the western shore the large framework in the water, which looks like the foundation for a screw-pile light-house, is the remains of an old shad-pier.

On the eastern shore of the harbor the land curves away to the eastward and then to the northward to **Fort Hale**, about a mile above; and thus is formed a large cove, called **Morris' Cove**, which affords convenient anchorage for wind-bound vessels with a depth of from seven to ten feet at low water. Its shores are faced by a beautiful regular sand beach and are for the most part under fine cultivation and thickly dotted with houses. About three-eighths of a mile below **Fort Hale** and three-quarters of a mile to the northward of **Five Mile Point** the line of beach is broken by a steep high bluff with level grassy summit and known as **Forbes' Bluff**.

Fort Hale is situated on the extremity of a flat grassy point nearly abreast of **Sandy Point**, (on the western shore,) and a mile and a quarter to the northward of **New Haven Tower**. It is a very old earthwork in a dilapidated state and is used only as a landmark.

The western shore of the harbor has a course about **NE.** from **Oyster River Point** to **Savin Rock** or **Cove Rock**, a mile and three-eighths above. The land is high, undulating, partly wooded, but mostly cleared near the shore-line and backed by trees. At **Savin Rock** it is low and marshy, but this is not perceived from the river, as the high lands alone show.

Savin Rock is a small rocky point about twenty feet high, with steep faces and level grassy summit, upon which there is a large house. About two hundred yards to the southward of it is a rocky ledge, bare at low water, and known as **Savin Rock Ledge** or **Cove Rock Ledge**. **Savin Rock** is the eastern point of entrance to **Oyster River**, a narrow, shallow and crooked stream of little importance. It is sometimes called **Cove Creek**. From **Savin Rock** the shore has a trend about **E. by N.** for about a mile,—being almost entirely occupied by the suburbs of the village of **West Haven**, which appears as thickly clustered houses standing amid gently sloping lands of moderate height, diversified with clumps of trees and crowned with woods. A prominent object in the village is a large hotel with cupola.

From the eastern extremity of **West Haven** the shore trends about **NE. $\frac{1}{4}$ E.** for five-eighths of a mile to **Sandy Point**, and is composed entirely of sand beach backed by marsh. **Sandy Point**, which is not visible from the river until you come abreast of it, is a long narrow point of bare sand with a few clumps of wire grass upon it, and a sand spit three-quarters of a mile long extending from it in a **NE. by N.** direction and dry at low water. On the northern extremity of the point stands a watch-house to protect the oyster beds in the vicinity, and on the northern end of the dry spit there is another.

Behind **Sandy Point** the western shore of the harbor makes about **N NW.** for nearly a mile to the mouth of **West River**, a shallow stream between five and six hundred yards wide, separating **New Haven** from **West Haven**. Its eastern point of entrance, known as **Oyster Point**, is seven-eighths of a mile **N. $\frac{1}{4}$ E.** from **Sandy Point**, and



Entrance to New Haven from the Eastward the 11th bearing N. 10° W. distance 33 Miles.



Entrance to New Haven from the Westward the 11th bearing N. E. 3/4 E. distance 31 Miles.

its eastern extremity is about nine hundred yards **NW. $\frac{1}{4}$ N.** from the watch-house on the northern end of the dry spit. Between these three points and the mouth of West River there is formed a shallow cove about three-quarters of a mile wide with from one to five feet at low water, in which there are many valuable oyster beds.

Oyster Point is the southern extremity of the city of New Haven. All of this western shore, as far up as Long Wharf, which is three-quarters of a mile to the northeastward of Oyster Point, is faced with marsh, and behind this low wooded lands thickly dotted with houses.

The eastern shores of the harbor north of Fort Hale are composed for the most part of marsh, which extends back from the shore-line, on an average about a quarter of a mile, to gently sloping, smooth, grassy land dotted with ornamental trees, and alternating with high rocky hills, partly wooded, and separated from each other by level cultivated lands. On the highest of these hills, which is nearly a mile to the northeastward of Fort Hale, is an old work called **Fort Wooster**; but it is scarcely distinguishable from the river.

Long Wharf, which is a mile and a half to the northeastward of Sandy Point and a mile and three-eighths to the northward of Fort Hale, is easily recognizable, as it is the southernmost as well as the longest wharf in the city proper. It extends in a **SE. by S. $\frac{1}{2}$ S.** direction for about eight hundred yards, and carries upon its broad pier-head the harbor light-house, which is known as Long Wharf Light-house. In the day-time it is very difficult to distinguish this light-house among the numerous small buildings which surround it; but the pier-head can always be seen. The light-house is a square wooden tower, sixteen feet high, painted drab, with brown trimmings, shows a fixed red light, of the sixth order, from a height of twenty-one feet above the sea, visible nine miles. Its geographical position is

Long Wharf Light-house.

Latitude ----- **41° 17' 33" N.**
 Longitude ----- **72° 55' 2" W.,**

and it bears from

	Miles.
The extremity of the point upon which Fort Hale is built, N. $\frac{1}{2}$ W. -----	1 $\frac{3}{4}$
New Haven Tower, N. $\frac{1}{2}$ W. -----	2 $\frac{1}{2}$
Southwest Ledge Light-house, N. $\frac{1}{2}$ E. -----	a little over 3 $\frac{1}{2}$
Sandy Point, NE. by N. $\frac{1}{2}$ N. -----	1 $\frac{1}{2}$

A little over half a mile to the northeastward of Long Wharf the harbor is crossed by a bridge, which unites the city of New Haven with the village of **East Haven**, on the eastern bank. Above the bridge **Mill River** runs to the northward and **Quinnipiac River** to the northeastward,—the neck of land separating the two being occupied by the village of **Fairhaven**. Both rivers are shallow, but the Quinnipiac has the best water. Their banks are lined with wharves; and Mill River, which forms the eastern boundary of New Haven, is crossed by a draw-bridge about five hundred yards above its mouth.

DANGERS

IN APPROACHING AND ENTERING NEW HAVEN HARBOR FROM THE EASTWARD.

On the **W. $\frac{1}{2}$ S.** course from between Inner and Wheaton's reefs, when past The Cow and Calf you must be careful to give the northern shore a berth of not less than three-quarters of a mile on account of the shoal water extending off from it. From the mouth of Farm River to Five Mile Point the shore is all foul,—having many sunken and bare rocks at distances from shore varying from three-eighths to five-eighths of a mile. Of these, the first met with after passing The Cow and Calf is **The Scotch Cap**, which lies off the entrance to Farm River, a mile and a quarter to the westward of Branford Point and three-eighths of a mile from shore. It is a mass of bare rock two hundred yards long **E. and W.**, and, being surrounded by dangerous shoals, should not be approached from the southward nearer than a quarter of a mile.

The Scotch Cap.

Half a mile to the westward of **The Scotch Cap** and the same distance from shore is a *sunken ledge with five feet at low tide*. It lies half a mile **SE. by S. $\frac{1}{4}$ S.** from South End and is not buoyed. To avoid it vessels beating in must be careful not to stand to the northward into less than three and a half fathoms.

Nearly half a mile to the westward of this rock and about a mile from **The Scotch Cap** lies **Round Rock**, a very small bare rock surrounded by sunken ledges,—the shoal water extending over an area a quarter of a mile square. The dry rock bears from South End **S SW.**

Round Rock.

Westerly, between eight and nine hundred yards, and from Morgan's Point **SE. $\frac{1}{4}$ S.**, five-eighths of a mile distant. From this rock **Southwest Ledge Light-house** bears **W. $\frac{1}{2}$ N.**, distant a mile and a quarter. The bare rock should receive a berth to the northward of not less than a quarter of a mile. There is no passage inshore of it. A red spar-buoy (No. 20) is placed in fifteen feet water to the southward of **Round Rock**.

A little to the southeastward of **Round Rock** lie *two detached eighteen feet spots*, bearing nearly due **S.** from South End and having from three and a half to five fathoms on all sides of them. The northernmost shoal bears from the buoy on **Round Rock SE. by S. $\frac{3}{4}$ S.**, distant a little over three-eighths of a mile; and exactly **S.** from this, with a narrow channel between them, lies the southernmost spot,—the distance being nearly a quarter of a mile. These shoals are not particularly dangerous to vessels bound to New Haven and the sailing-line passes well to the southward of them.

On the southern side of the channel, nearly in range with Round Rock buoy and Morgan's Point, and bearing from the southernmost of the eighteen feet spots (mentioned above) **SE.** by **S.**, distant nearly a mile, lies Townsend's Ledge, another detached eighteen feet spot with deep water all around it. It is about two hundred yards in diameter, and on its southwestern edge is placed a spar-buoy painted red and black in horizontal stripes. This buoy bears from

	Miles.
Southwest Ledge Light-house, SE. $\frac{1}{4}$ E. -----	2 $\frac{1}{2}$
New Haven Tower, SE. by S. $\frac{1}{2}$ S. -----	2 $\frac{7}{8}$
Morgan's Point, SE. by S. $\frac{3}{4}$ S. -----	2 $\frac{1}{4}$

When in the vicinity of this ledge vessels should watch the bearings carefully and be guided accordingly.

Between Round Rock and Morgan's Point, about nine hundred yards from the former and three hundred from the latter, lies another bare rock, known as **High Water Rock**. It is not in the way of vessels, however, unless they attempt to enter between Quixe's Ledge and Morgan's Point,—a passage which no stranger should attempt.

When past Round Rock the next danger met with is an eight feet rock, known as **The Chimneys**. It is quite small and surrounded by depths of from fifteen to twenty feet; but it is not safe to attempt to pass to the northward of it. This shoal lies nearly midway between Round Rock and Southwest

Ledge and exactly in line with the rock and the light-house. It bears from Round **The Chimneys**. Rock **W.** $\frac{1}{2}$ **N.**, a little over five-eighths of a mile, and from Morgan's Point **SW.** by **S.** $\frac{1}{4}$ **S.**, nearly half a mile distant. Southwest Ledge Light-house bears from this rock **W.** $\frac{1}{2}$ **N.**, distant about five-eighths of a mile, and the spindle on Quixe's Ledge **NW.** by **N.** $\frac{1}{2}$ **N.**, distant about five hundred yards. It is not buoyed, but is not in the way unless you are beating to windward, in which case, to avoid it as well as the ledges to the westward of it, you should not stand to the northward of Southwest Ledge Light-house bearing **W.** by **N.** $\frac{3}{4}$ **N.**

About one hundred and fifty yards to the westward of **The Chimneys** lies **Mary's Rock** with twelve feet at mean low water; about one hundred yards to the northwestward of this, and two hundred yards to the westward of **The Chimneys**, lies **Dick's Rock** with fifteen feet; and a little over one hundred and fifty yards **WNW.** from **Dick's Rock** lies **The Big Boil** with seven feet. Of these only the last named is buoyed. It is marked by a red spar-buoy (No. 2) placed in two fathoms close to its western edge,—Southwest Ledge Light-house bearing **W.** $\frac{1}{4}$ **N.**, distant eight hundred yards. **Mary's Rock** bears **E.** $\frac{3}{4}$ **S.** from Southwest Ledge Light-house, a little over half a mile; **Dick's Rock** **E.** $\frac{3}{4}$ **S.**, exactly half a mile; and **The Big Boil** **E.** $\frac{1}{4}$ **S.**, nearly nine hundred yards distant. To avoid them all go about as soon as Southwest Ledge Light-house bears **W.** by **N.** $\frac{3}{4}$ **N.**

More than three-quarters of a mile **WNW.** from Round Rock and eight hundred yards to the southwestward of Morgan's Point lies **Quixe's Ledge**,—the iron spindle on which, surmounted by a cask placed horizontally, is one of the prominent objects seen on approaching the harbor from the eastward. The spindle stands upon a rock, bare at half tide, near the northwestward end of the ledge, and from it shoal water extends in a **SE.** $\frac{1}{2}$ **E.** direction for nearly two hundred yards and in a **S.** by **E.** $\frac{1}{2}$ **E.** direction over two hundred yards. Six feet at low water is found one hundred yards to the southeastward of the spindle and ten feet two hundred yards **SSE.** from the same.

Quixe's Ledge is not in the way of vessels coming into this harbor from the eastward unless they intend passing to the eastward of Southwest Ledge, which strangers must not attempt to do.

On nearing Southwest Ledge Light-house be careful, in standing to the northward, not to pass beyond the bearing of **W.** by **N.** $\frac{3}{4}$ **N.**, as mentioned above, as there are several detached rocks to the northeastward of the light-house at distances of from one hundred and fifty to three hundred yards,—none of which are buoyed. Of these the easternmost is called **Middle Rock**, has ten feet at low water, and bears from Southwest Ledge Light-house **E.** by **N.** $\frac{3}{4}$ **N.**, distant three hundred yards. A hundred yards to the westward of it lies **Tortoise Rock** with thirteen feet, which bears from Southwest Ledge Light-house **NE.** by **E.** $\frac{1}{4}$ **E.**, distant a little over two hundred yards; and about one hundred yards to the southwestward of this lies **Ragged Rock** with twelve feet, which bears from the light-house **E.** by **N.** $\frac{3}{4}$ **N.**, distant one hundred and fifty yards. Vessels of less draught than eight feet pay no attention to these rocks, but pass on either side of Southwest Ledge, as suits their convenience.

Southwest Ledge, which was formerly one of the most dangerous obstructions in the approach to New Haven Harbor, is now occupied by the light-house, before described on page 446. Vessels may approach the light-house from any direction within one hundred yards and carry not less than eighteen feet. It is usual, however, to pass to the westward of it.

If beating to windward do not stand to the westward after passing Southwest Ledge farther than to bring New Haven Tower to bear **NE.**, by which means you will avoid **Luddington Rock**,—the striped nun-buoy on which will be plainly visible at a distance of over a mile. This is a detached rock with fifteen feet at mean low water and thirteen at low spring tides, and lies at the extreme southeastern end of the shoals which make off from

the West Haven shore. For vessels of twelve feet draught or less there is a good passage to the northward of the rock, (see Sailing Directions,) but the main channel passes to the eastward of it. The buoy is a nun of the first class, painted red and black in horizontal stripes, and placed in fifteen feet close to the eastern edge of the shoal. It bears from Branford Reef Beacon **W.** by **N. Northerly**, nearly five miles and three-eighths, and from Southwest Ledge Light-house **W.** by **S.**, nearly twelve hundred yards distant. From this buoy New Haven Tower bears **NE. $\frac{3}{8}$ E.**, distant a mile and three-eighths; the black buoy on the West Haven Flats **N.** by **W. $\frac{1}{4}$ W.**, more than five-eighths of a mile; and the black buoy on Party's Bar **N.** by **E. $\frac{3}{8}$ E.**, distant a little over two miles.

When up with Southwest Ledge the course turns abruptly to the northward and there will be seen a little to the eastward, bearing about **NE. $\frac{3}{8}$ N.** and nearly half a mile off, a red can-buoy.* This is on Adam's Fall, a detached ledge, with five feet at low water, lying a little over half a mile to the northward of Southwest Ledge Light-house and three-eighths of a mile to the southwestward of Five Mile Point. The buoy is marked No. 4, placed close to the rock on its western side, and bears from Southwest Ledge Light-house **N.** by **E. Easterly**, about eleven hundred yards; from Luddington Rock buoy **NE. Easterly**, nearly a mile; and from the spindle on Quixe's Ledge **NW.**, a little over half a mile distant. From this buoy

New Haven Tower bears NE. by E.	900 yards.
The black buoy on Party's Bar N.	about 1 $\frac{1}{4}$ miles.
The red buoy off Black Rock N. $\frac{7}{8}$ E.	1 $\frac{1}{2}$ "
Long Wharf Light-house N. $\frac{3}{8}$ E.	nearly 3 "

When between Southwest Ledge Light-house and Adam's Fall buoy, if you are beating to windward, do not stand to the eastward of the light-house bearing **S. $\frac{1}{2}$ W.**, or Long Wharf Light-house **N. $\frac{1}{2}$ E.** By this means you will avoid not only Adam's Fall but also Old Head Reef, a dangerous shoal lying about four hundred and fifty yards to the northwestward of Quixe's Ledge spindle and half a mile to the westward of Morgan's Point. It lies nearly **NE. by E.** and **SW.**

by **W.**, is about three hundred yards long, and has seven feet at its northeastern and nine feet at its southwestern end. It is not buoyed, but should be marked by a red buoy; and such action will be recommended. The nine feet spot on the southwestern end of this reef bears from Quixe's Ledge spindle **NW.** by **W. $\frac{3}{4}$ W.**, distant between four and five hundred yards, and from Southwest Ledge Light-house **NE.**, distant nearly eight hundred yards. From this western end of the reef New Haven Tower bears **NNE. Northerly**, a little over half a mile, and the red buoy on Adam's Fall **NW.** by **N.**, a little over six hundred yards distant.

On the western side of the channel, while to the southward of Five Mile Point, vessels of twelve feet draught or over should not stand to the westward of the point on which Fort Hale is built bearing **NE. $\frac{3}{4}$ N.** to avoid the West Haven Flats. The southern extremity of these flats, which have from one to ten feet water upon them, is marked by a black spar-buoy (No. 1) placed in two fathoms, and bearing from Luddington Rock buoy **N.** by **W. $\frac{1}{4}$ W.**, over five-eighths of a mile, and from Southwest Ledge Light-house **NW. $\frac{3}{4}$ W.**, more than seven-eighths of a mile distant. From this buoy the red can-buoy on Adam's Fall bears **E.**, nearly seven-eighths of a mile, and New Haven Tower **E.** by **N.**, a mile and a quarter distant.

When to the northward of Adam's Fall there are no dangers except the flats on both sides of the channel. Those on the eastern side may be avoided, while you are to the southward of Fort Hale, by not standing to the eastward of Southwest Ledge Light-house bearing **S.** by **W.**; while those on the western side can only be avoided by the use of the lead and not standing into less than thirteen feet. The water shoals gradually on both sides of the channel up to twelve feet, and then the soundings decrease rapidly,—the edge of the flats being quite steep. Care must be taken, therefore, to go about in good time. The exception to this rapid shoaling inside the twelve feet line is in Morris' Cove, where the depth decreases with great regularity from the channel to the beach.

When nearly abreast of Forbes' Bluff a black nun-buoy will be seen a little to the westward of the course, bearing **N.**, and about eight hundred yards off. This is on Party's Bar,—the name given to that portion of the West Haven Flats which extends off from Sandy Point and has from one to three feet water upon it. The buoy, which is marked No. 3, is placed in two fathoms on the eastern edge of the flats, and bears from

New Haven Tower, N. by W. $\frac{3}{4}$ W.	nearly 1 $\frac{1}{8}$ Miles.
Adam's Fall buoy, N.	1 $\frac{1}{4}$ "
Southwest Ledge Light-house, N. $\frac{3}{8}$ E.	nearly 1 $\frac{1}{8}$ "
The black spar-buoy on the southern end of the West Haven Flats, NE. by N.	1 $\frac{1}{2}$ "

From this buoy

The centre of Fort Hale bears NE. by E. $\frac{5}{8}$ E.	nearly 1200 yards.
Long Wharf Light-house N. $\frac{1}{4}$ E.	1 $\frac{1}{8}$ miles.
The black buoy on Shag Bank N. $\frac{3}{8}$ E.	1 " mile.
The watch-house on Sandy Point NW. by W. $\frac{1}{2}$ W.	a little over 1 " "

When up with the buoy on Party's Bar there will be seen on the eastern side of the channel and about six hundred yards off in a NE. by N. direction a red spar-buoy. This is near Black Rock, off Fort Hale, but is placed so far to the westward of the rock that it may be safely passed on either hand. Black Rock, which is out at low water, lies about an eighth of a mile WNW. from the end of the long wharf near the northern end of Morris' Cove and about two hundred yards from shore. The buoy is between five and six hundred yards NW. by W. $\frac{3}{4}$ W. from the rock and is placed in seventeen feet water nearly in mid-channel. It is marked No. 6, and bears from

	Miles.
New Haven Tower, N. $\frac{1}{2}$ W. -----	1 $\frac{1}{4}$
The red buoy on Adam's Fall, N. $\frac{7}{8}$ E. -----	1 $\frac{1}{2}$
Southwest Ledge Light-house, N. by E. Northerly ----- a little over	2
The black buoy on Party's Bar, NE. $\frac{1}{2}$ E. ----- between 600 and 700 yards.	

From this buoy the centre of Fort Hale bears E. $\frac{3}{8}$ N., a quarter of a mile; Long Wharf Light-house N., a mile and three-eighths; and the black buoy on Shag Bank N. by W. $\frac{1}{2}$ W., about fourteen hundred yards distant.

Shag Bank is on the western side of the channel and is dry at low water. It is that long sand spit which makes off to the northeastward from Sandy Point for three-quarters of a mile, forming a sort of natural breakwater to the mouth of West River. A watch-house built upon piles stands upon the northern extremity of the dry spit; and beyond this shoal water extends to the northward for about three hundred yards,—the flats having less than six feet at low tides. A black spar-buoy (No. 5) is placed in fourteen feet on the eastern edge of the bank and near its northern end, and bears from the black buoy on Party's Bar N. $\frac{3}{8}$ E., seven-eighths of a mile; from the red buoy off Black Rock N. by W. $\frac{1}{2}$ W., fourteen hundred yards; and from the watch-house on the northern end of the dry part of the bank NE. by E. $\frac{3}{4}$ E., about three hundred yards distant. From this buoy Long Wharf Light-house bears N. by E. Easterly, distant three-quarters of a mile.

Above Shag Bank the channel is exceedingly narrow,—*extensive flats, with from one to five feet upon them*, making off from both shores and contracting the width of the channel between the lines of twelve feet to about sixty yards. Through this narrow channel not less than fourteen feet may be carried at mean low tide; but sailing-vessels can use it only with a fair wind or with the assistance of a tug-boat. Vessels of six feet draught or less have a channel to work in, between the flats, about four hundred yards wide, as far up as Long Wharf; but beyond that it is diminished to a width of two hundred yards and at the bridge it is only about one hundred and fifty yards wide.

On the eastern side of the channel, nearly opposite to but a little above the buoy on Shag Bank, there is a long sand spit making off from the eastern shore for about four hundred and fifty yards and dry at low water. It is known as Cranes Bar, and its western extremity bears from

Cranes Bar. the red buoy off Black Rock N. by E. $\frac{1}{2}$ E., nearly seven-eighths of a mile; from the black buoy on Party's Bar NNE., one mile and an eighth; and from the black buoy on Shag Bank NE. by E. $\frac{3}{4}$ E., about eight hundred yards distant. From this western end of the bar Long Wharf Light-house bears N. by W. $\frac{3}{4}$ W., about twelve hundred yards, and the draw in the bridge N. by E. $\frac{1}{2}$ E., seven-eighths of a mile distant. It is not buoyed, as it is all flat to the westward of it, and even the smallest vessels must not approach it nearer than four hundred yards.

Good anchorage is found off Long Wharf and a little to the southward of it in from thirteen to sixteen feet, and between the railroad wharf and the bridge in from fourteen to seventeen feet at mean low water.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING NEW HAVEN HARBOR.

I. *From the Eastward.*—1. *Having come through the Thimbles Channel.*—On the W. $\frac{1}{2}$ S. course through this channel, from between Inner Reef and Wheaton's Reef, when Southwest Ledge Light-house bears N. by W. $\frac{3}{4}$ W., distant one mile and three-quarters, and New Haven Tower N. $\frac{1}{2}$ E., distant two miles, you will have six fathoms and must steer NW. by N. $\frac{3}{4}$ N., carrying not less than three and a half fathoms, until past Southwest Ledge Light-house and New Haven Tower bears NE. $\frac{3}{8}$ N., distant one mile, and Southwest Ledge Light-house E., distant a quarter of a mile. Here you will have four fathoms, and N. by E. $\frac{1}{2}$ E. will lead through the middle of the channel, with not less than thirteen feet, until past Fort Hale and Long Wharf Light-house bears N. $\frac{1}{2}$ E. Now, if you are of less draught than eight feet, you may steer for the light-house, carrying not less than ten feet at low water. But, if you desire to keep the best water, you must, when the light-house bears N. $\frac{1}{2}$ E., as before, and the watch-house on the northern end of Shag Bank NW. by N. $\frac{1}{2}$ N., steer N. $\frac{3}{4}$ W., carry-

ing not less than fifteen feet, until up with the black buoy on Shag Bank and Long Wharf Light-house bears **N. $\frac{3}{4}$ E.** Now steer for the light-house and anchor when you please; or, if bound up to the bridge, when near the wharf give it a berth to the westward of about one hundred feet and steer **NE.** by **E.** for the draw. *Sailing Directions---New Haven Harbor.*

The above courses pass one mile to the southward of The Scotch Cap; one mile to the southward of the five feet rock off South End; the same distance to the southward of the shoal water surrounding Round Rock; three-eighths of a mile to the southward of the southernmost of the eighteen feet spots **SE.** of Round Rock; half a mile to the northward of Townsend's Ledge; one mile and an eighth to the southward of The Chimneys; the same distance to the southward of Mary's and Dick's rocks; one mile and three-quarters to the southward of the spindle on Quixe's Ledge; about one mile and a quarter to the southward, and five-eighths of a mile to the westward, of the red buoy on The Big Boil; about four hundred and fifty yards to the westward of Southwest Ledge Light-house; nearly half a mile to the eastward of the striped buoy on Luddington Rock; eight hundred yards to the westward of Old Head Reef; five-eighths of a mile to the eastward of the black buoy on the southern end of the West Haven Flats; between three and four hundred yards to the westward of the red buoy on Adam's Fall; two hundred yards to the eastward of the black buoy on Party's Bar; about one hundred and eighty yards to the westward of the red buoy off Black Rock; one hundred yards to the eastward of the black buoy on Shag Bank; and between five and six hundred yards to the westward of the western extremity of Cranes Bar.

Or, you may continue the course NW. by N. $\frac{3}{4}$ N. past Southwest Ledge Light-house until you open the round top of Mount Carmel just past the western edge of East Rock on a bearing of **N.** by **E. Easterly.** Steer in on that range, carrying not less than thirteen feet at mean low water, until Long Wharf Light-house bears **N. $\frac{1}{4}$ E.** and the watch-house on the northern end of Shag Bank **NW. $\frac{1}{2}$ N.,** when steer **N. $\frac{3}{4}$ W.** and follow the directions given above.

The above courses pass eight hundred and fifty yards to the westward of Old Head Reef; five-eighths of a mile to the eastward of the black buoy on the southern end of the West Haven Flats; a little over four hundred yards to the westward of the red buoy on Adam's Fall; one hundred yards to the eastward of the black buoy on Party's Bar; and nearly three hundred yards to the westward of the red buoy off Black Rock.

Or, you may, on the W. $\frac{1}{2}$ S. course through the Thimbles Channel, bring Southwest Ledge Light-house to bear **NW. $\frac{3}{4}$ N.** and New Haven Tower **N. by W. $\frac{3}{4}$ W.** and steer **NW.,** carrying not less than three and three-quarter fathoms, until you open Mount Carmel past the western edge of East Rock on a bearing of **N. by E. Easterly,** as before, when steer in on that range and follow the directions given above.

Or, if you are of less draught than eight feet, you may, when past Southwest Ledge Light-house, bring it to bear **S. $\frac{1}{2}$ W.** and steer **N. $\frac{1}{2}$ E.** directly for Long Wharf Light-house. On this course you will not have less than twelve feet until past the black buoy on Shag Bank, above which the course crosses the flats in not less than nine feet at mean low water.

This course passes a quarter of a mile to the westward of Old Head Reef; a little over one hundred yards to the westward of the red buoy on Adam's Fall; the same distance to the eastward of the black buoy on Party's Bar; three hundred yards to the westward of the red buoy off Black Rock; and about one hundred and fifty yards to the eastward of the black buoy on Shag Bank.

Or, wishing to enter between Quixe's Ledge and Morgan's Point.—On the **W. $\frac{1}{2}$ S.** course through the Thimbles Channel, as before, bring Southwest Ledge Light-house to bear **NW. by W. $\frac{3}{4}$ W.,** distant two miles and a quarter, and New Haven Tower **NW. $\frac{3}{4}$ N.,** distant two miles and three-eighths, and steer **NW.,** which course will lead, with not less than thirteen feet, between Morgan's Point and Quixe's Ledge. On this course, if you are of less draught than eight feet, when just past the buoy on Adam's Fall and Long Wharf Light-house bears **N. $\frac{1}{2}$ E.** steer that course; *or,* wishing to carry the best water in, continue the **NW.** course until you open the round top of Mount Carmel just past the western end of East Rock on a bearing of **N. by E. Easterly,** when steer in on that range and follow the previous directions. But strangers must not attempt this passage.

This course passes an eighth of a mile to the southwestward of the shoal water surrounding Round Rock and between five and six hundred yards to the westward of the rock itself; three hun-

Sailing Direc- dred yards to the northeastward of The Chimneys; a quarter of a mile to the south-
tions--- **New** westward of High Water Rock; one hundred and fifty yards to the northeastward
Haven Harbor. of the spindle on Quix's Ledge; nearly two hundred yards to the southwestward
of the eleven feet rock off Morgan's Point; about one hundred and seventy-five
yards to the northeastward of the eastern end of Old Head Reef; the same distance to the north-
eastward of the red buoy on Adam's Fall; and about one hundred and fifty yards to the eastward
of the rock itself.

2. Having come through the main passage of the North Channel, to enter New Haven Har-
bor.—On the **W.** by **S.** $\frac{1}{8}$ **S.** course through the North Channel, when Southwest Ledge Light-house
bears **NW.** $\frac{1}{2}$ **N.** steer for it until within two hundred yards of it, when steer to the westward, giving
the light-house a berth to the eastward of one hundred and fifty yards, and continue to the westward
until the round top of Mount Carmel opens just past the western edge of East Rock. Now steer in
on that range and follow the directions given above.

II. To enter New Haven Harbor from the Westward.—**1. To pass to the Southward of Lud-**
dington Rock.—When off Stratford Point, with Middle Ground Light-house bearing **SE.** by **S.** $\frac{3}{8}$ **S.**,
distant two and a quarter miles, and Stratford Point Light-house **NE.** by **N.** $\frac{1}{2}$ **N.**, distant three and
three-quarter miles, steer **NE.** by **E.** $\frac{1}{4}$ **E.**, which course will lead directly for Southwest Ledge Light-
house. On this course, when in nineteen feet water and about six hundred yards from the light-house
the round top of Mount Carmel will be open just past the western edge of East Rock. Steer in on
that range and follow the directions previously given.

These courses pass four hundred yards to the southward, and over six hundred yards to the east-
ward, of Luddington Rock.

2. To pass to the Northward of Luddington Rock.—When off Stratford Point, with the light-
house bearing **NE.** by **N.** $\frac{1}{2}$ **N.**, distant three and three-quarter miles, and Middle Ground Light-house
SE. by **S.** $\frac{5}{8}$ **S.**, distant two and a quarter miles, as before, steer **NE.** by **E.** **Easterly**, which course will
lead directly towards New Haven Tower with not less than seventeen feet at low water. On this
course, when within three-quarters of a mile of the tower, in twenty-two feet, with Southwest Ledge
Light-house bearing **S.** by **E.** $\frac{3}{8}$ **E.**, distant about eight hundred and fifty yards, the round top of
Mount Carmel will be open with the western edge of East Rock on a bearing of **N.** by **E.** **Easterly**;
and that course must be steered into the harbor, following the directions given on the preceding page.

The above courses pass between eight and nine hundred yards to the southward of the black buoy
on the southern end of West Haven Flats and four hundred and fifty yards to the northward of the
striped buoy on Luddington Rock.

It must be recollected, in this connection, that the current of flood and ebb sets almost directly
across the **NE.** by **E.** **Easterly** course for New Haven Tower with a velocity of about one mile an
hour; and care must be taken, therefore, to make the course good by steering to the northward of the
true course if the tide be ebb and to the eastward of it during flood tide.

LIGHT-HOUSES.

NAME.	Latitude.	Longitude West.			Fixed or Revolving.	Height above sea- level.	Distance visible in nautical miles.
		In arc.		In time.			
	° ' "	° ' "	h. m. s.		Feet.		
Southwest Ledge Light-house	41 14 2	72 54 45	4 51 39	Fixed.	57	13	
Long Wharf Light-house	41 17 33	72 55 2	4 51 40	Fixed red.	21	9	

TIDES.

	Five Mile Point.	Chapel St. Bridge.
Corrected Establishment	11 ^b 16 ^m	
Mean Rise and Fall of tides	6.05 ft.	6.23 ft.
Mean Rise and Fall of Spring tides	6.33 ft.	6.30 ft.
Mean Rise and Fall of Neap tides	5.62 ft.	6.12 ft.
Rise of highest tide observed	7.52 ft.	7.46 ft.

CURRENTS.

LOCALITY.	Second Quarter.		Third Quarter.		Flood or Ebb.
	Set.	Drift.	Set.	Drift.	
Two miles and three-quarters S SW. from Southwest Ledge Light-house	NW. $\frac{1}{2}$ W. ----	1.27	NW. by W. ----	0.95	Flood.
	E. $\frac{1}{2}$ N. ----	1.20	E. by N. $\frac{1}{2}$ N. ----	0.95	Ebb.

The observations of currents were made as far as possible when the influence of the wind was small. The directions are magnetic and the drift in nautical miles per hour.

VARIATION OF THE COMPASS.

The magnetic variation for 1880 is $8^{\circ} 40' W.$, with an approximate annual increase of nearly $2\frac{1}{2}'$.

MILFORD HARBOR.

The entrance to this harbor is a little over six miles to the westward of Southwest Ledge Light-house and is contained between Welch's Point on the east and Charles' Island on the west. The north shore of the Sound from Welch's Point has a general course **N NW.** for about three-quarters of a mile to the mouths of Indian and Milford rivers. Thence it turns abruptly to the westward,—running about **SW. by W.** for a mile and a quarter, where begins a dry sand spit, which extends in a southeasterly direction to Charles' Island. Thus is formed a large cove, a little over a mile in diameter, known as Milford Harbor in which anchorage in from six to fourteen feet may be found, sheltered from all but southerly winds.

Welch's or Cedar Point, the eastern point of entrance to the harbor, is low and flat,—the land rising very gradually to the northward to a wooded summit, about one hundred feet high, on the southern bank of Indian River.

Charles' Island, the western point of entrance, is about a mile **SW. by W.** from Welch's Point. It is a low and nearly round island, about a quarter of a mile in diameter, with a gently sloping surface, dotted with thick bushy trees except at its southern end, which has but a single Lombardy poplar. A large white house is visible above **Charles' Island.** the trees on the summit of the island, and another with a tall brick chimney attached is seen on its north-western end. This latter is used as a fish-oil factory. Charles' Island is shoal in its approaches and should receive a berth to the northward of not less than three-eighths of a mile.

The shores of the harbor are for the most part composed of marsh, although spurs of fast land, of moderate height, undulating, and generally cultivated, project here and there between the marshes. Especially is this the case between Welch's Point and Indian River, where the land is mainly composed of cultivated fields, somewhat hilly, dotted here and there with clumps of trees, and terminating to the westward in steep nearly perpendicular faces. The same is true of the narrow neck of land separating Indian and Milford rivers, which, though flatter than that on the eastern side of Indian River, is almost entirely under cultivation. To the westward of Milford River the land near the shore-line is almost entirely marsh.

Indian River is not, strictly speaking, a river, as its mouth is closed by a dam situated about half a mile to the northward of Welch's Point. Just to the westward of it is the entrance to **Milford River**, a narrow and shallow stream,—on the western bank of which, about three-quarters of a mile above its mouth, is situated the village of **Milford.**

It is not possible to enter this river, even for vessels of the lightest draught, except at high water, as the flats at its mouth are dry at low spring tides. The anchorage off the mouth of the river is properly known as **Milford Roadstead**, (instead of the common name Milford Harbor,) being open to southerly and southeasterly winds.

DANGERS

IN APPROACHING AND ENTERING MILFORD HARBOR.

In approaching this harbor from the North Channel of Long Island Sound you must be careful not to approach Pond Point too closely, as shoal water extends from it to the southward for three-eighths of a mile. Vessels of less than twelve feet draught, however, may come within a quarter of a mile of the point,—being guided by the red spar-buoy which will be seen on the southern end of the shoal. This shoal is known as **Pond Point Reef**; and the buoy, which is marked No. 14, bears from Southwest Ledge Light-house **W. by S.** distant six miles. From this buoy Cedar Point Reef buoy bears **W. $\frac{1}{2}$ S.**, distant one mile, and the hotel on Charles' Island **W. $\frac{1}{2}$ S.**, distant two miles.

Cedar Point Reef is formed by a rocky shoal making to the southeastward from Welch's or Cedar Point for three-eighths of a mile. It is not safe for vessels of twelve feet draught to approach the point from the southward nearer than six hundred yards, and a red spar-buoy (No. 16) is placed on the southern end of the reef as a guide to strangers. The sailing-line into **Milford Roadstead** passes well to the westward of this buoy, and when abreast of it there will be seen to the southwestward, and about three-quarters of a mile off, a black spar-buoy. This is on **Charles' Island Rocks**, which make off in a southerly direction

**Pond Point
Reef.**

**Cedar Point
Reef.**

from Charles' Island for about a quarter of a mile, with soundings varying from two to ten feet at low water. The buoy is marked No. 1, placed in three fathoms on the southern end of the ledge, and bears from the red buoy on Pond Point Reef **W.** by **S.** $\frac{1}{2}$ **S.**, one mile and three-quarters; from Pond Point **SW.** by **W.** $\frac{3}{4}$ **W.**, two miles; and from the red buoy on Cedar Point Reef **SW.** by **W.** $\frac{1}{4}$ **W.**, one mile distant. From this buoy the hotel on Charles' Island bears **N.** by **W.**, distant three-eighths of a mile.

In coming into the Roadstead be careful not to approach the eastern side of Charles' Island nearer than six hundred yards, as *the water is shoal*. A black spar-buoy is placed in two fathoms on the western side of the channel as a warning to vessels to keep off this shore. It is marked No. 3, and is the last buoy met with on entering the harbor.

The lead will be the best guide in seeking an anchorage, only observing that in approaching the northern shore of the harbor you should not *stand into less than ten feet*—the water shoaling rapidly as you approach the mouth of Milford River.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING MILFORD HARBOR.

I. From the Eastward.—1. From off New Haven.—Having come through the Thimbles Channel as far as New Haven Entrance, when, on the **W.** $\frac{1}{2}$ **S.** course from between Inner and Wheaton's reefs, Southwest Ledge Light-house bears **N.** by **W.** $\frac{3}{4}$ **W.**, distant one mile and three-eighths, and New Haven Tower **N.** $\frac{1}{8}$ **E.**, distant two miles, you will have six fathoms, with Stratford Point Light-house bearing **W.** by **S.** $\frac{1}{2}$ **S.**, distant ten miles, and must steer that course for the light-house, carrying not less than twenty-two feet, until the hotel on Charles' Island bears **NW.** $\frac{3}{4}$ **W.** and the summit of the high land on Pond Point **NE.** by **N.** $\frac{3}{8}$ **N.** Now steer **NW.** by **N.** $\frac{3}{8}$ **N.**, which course will lead safely for the anchorage. The soundings decrease gradually until you strike ten feet, after which the water shoals abruptly.

The above courses pass seven-eighths of a mile to the southward of the red buoy on Pond Point Reef; three-quarters of a mile to the eastward of the black buoy on Charles' Island Rocks; a quarter of a mile to the westward of the red buoy on Cedar Point Reef; and three-eighths of a mile to the eastward of the black buoy off the eastern end of Charles' Island.

2. Having come through the main passage of the North Channel, to enter Milford Harbor.—On the course **W.** by **S.** $\frac{1}{8}$ **S.** from between Falkner's Island Light-house and Indian Reef, (see page 396,) when Southwest Ledge Light-house bears **NE.** $\frac{1}{2}$ **N.** Northerly, Stratford Point Light-house **W.** by **N.** $\frac{5}{8}$ **N.**, and Middle Ground Light-house **SW.** by **W.** $\frac{1}{4}$ **W.**, steer **NW.** by **N.** $\frac{3}{8}$ **N.**, which course will lead safely into the harbor, as above mentioned.

II. Coming from the Westward, to enter Milford Harbor.—1. From off Stratford Point.—With the light-house bearing **N.** $\frac{3}{4}$ **E.** Easterly, distant a mile and three-quarters, and Middle Ground Light-house **S.** $\frac{3}{4}$ **W.**, distant three miles and five-eighths, steer **NE.** $\frac{1}{8}$ **N.**, carrying not less than three and a half fathoms, until the hotel on Charles' Island bears **NW.** $\frac{3}{4}$ **W.**, distant nine hundred yards, and the southern extremity of Pond Point **NE.** by **E.** $\frac{1}{2}$ **E.** Easterly, distant one mile and three-quarters. Now steer **N.** by **E.** $\frac{3}{8}$ **E.** for about five-eighths of a mile, or until you are exactly between Cedar Point and the hotel on Charles' Island,—the former bearing **NE.** by **E.** $\frac{1}{4}$ **E.** and the latter **SW.** by **W.** $\frac{1}{4}$ **W.** Here you will have three fathoms and **NW.** by **N.** $\frac{1}{4}$ **N.** will lead safely to the anchorage.

The above courses pass three hundred yards to the southeastward of the black buoy on Charles' Island Rocks; four hundred yards to the eastward of the black buoy off the eastern end of Charles' Island; and three-eighths of a mile to the westward of the red buoy on Cedar Point Reef.

2. On the course E. by N. $\frac{1}{8}$ N. for the entrance to the North Channel of Long Island Sound, to enter Milford Harbor.—When Stratford Point Light-house bears **NE.** by **N.** $\frac{1}{2}$ **N.**, distant three miles and three-quarters, and Middle Ground Light-house **SE.** by **S.** $\frac{3}{8}$ **S.**, distant two miles and a quarter, steer **NE.** $\frac{1}{8}$ **N.** until the hotel on Charles' Island bears **NW.** $\frac{3}{4}$ **W.**, distant nine hundred yards, and the southern extremity of Pond Point **NE.** by **E.** $\frac{1}{2}$ **E.** Easterly, distant one mile and three-quarters, when steer **N.** by **E.** $\frac{3}{8}$ **E.** and follow the directions previously given for the harbor.

The **NE.** $\frac{1}{8}$ **N.** course for the entrance to the harbor passes one mile and an eighth to the eastward of the red buoy on Stratford Point Shoal and about one mile to the eastward of Stratford Point.

STRATFORD HARBOR.

This harbor lies at the mouth of the Housatonic River, and cannot be entered by strangers owing to the bar at its mouth, over which but two feet at low water can be taken through a very narrow channel. The Housatonic River has its rise in a small lake in the county of Berkshire, near the western border of Massachusetts, and takes a winding course for one hundred miles through Massachusetts and Connecticut, emptying into Long Island Sound about ten miles to the westward of New Haven Entrance. Vessels of very light draught may proceed up the river for about twelve miles; but beyond this there is no navigation. The town of Stratford is situated upon the western bank, about two miles above Stratford Point, and is the only place of any importance on the river. The New York and New Haven Railroad crosses by a bridge about a mile above the town.

The eastern point of entrance to this river is formed by a long, low, flat sand beach, extending in a southwesterly direction from the mainland for nearly three-quarters of a mile and reducing the actual width of the entrance to about five hundred yards. This point, as well as the western shore, is skirted by extensive mud flats, dry at low water.

The western point of entrance to the river is known as Stratford Point. It is of moderate height and grassy, (except where a few clumps of trees dot its surface,) and shows steep sandy faces to the southward and eastward. Back of the point the land is all cleared and for the most part low and nearly level, with the usual high hills in the distance. On a cleared and nearly level space at its southeastern end will be seen the light-house, known as Stratford Point Light-house. It is an eight-sided wooden tower, painted black and white in vertical stripes, with a white house on each side of it, and shows a revolving white light, of the third order, from a height of fifty-three feet above the sea, visible twelve miles. The light revolves once in every minute and a half. Its geographical position is

Latitude 41° 9' 5" N.
 Longitude 73° 6' 13" W.,

and it bears from Southwest Ledge Light-house W. by S. $\frac{1}{4}$ S., about ten miles, and from Falkner's Island Light-house W. Southerly, twenty miles and a half distant. From this light-house

	Miles.
Middle Ground Light-house bears S. $\frac{1}{4}$ W.	5 $\frac{1}{2}$
Old Field Point Light-house S. by W. Westerly	10 $\frac{1}{2}$
Eaton's Neck Light-house SW. by W. $\frac{1}{4}$ W.	18
Norwalk Light-house W. by S. $\frac{1}{4}$ S.	15 $\frac{1}{2}$
Penfield's Reef Light-house W. by S. $\frac{1}{4}$ S.	5 $\frac{1}{2}$

A bell is struck by machinery during thick weather,—first, four blows at intervals of ten seconds; and, after a pause of thirty seconds, again four blows ten seconds apart.

It may be well to remark in this connection that a distinguishing landmark for the entrance to the Housatonic is Tashua Hill, which will appear in the distance as a very high, smooth, round hill with a prominent tree on top. It cannot be mistaken, as, apart from the peculiarities just described, it is by far the highest land in this vicinity.

From Stratford Point to the northward the western bank of the river is composed of low, nearly level, grassy land, with occasional steep faces, but for the most part fringed with marsh. The town is situated amid level fields faced by marsh and is of little commercial importance, although it has some manufacturing interest.

On the eastern bank, after passing the long sand point at the entrance, the river spreads away into a wide but shallow bay, which at low water is almost entirely bare,—the mud flats extending from the eastern bank to within a quarter of a mile of the western shore. A very narrow channel, through which not more than eight feet at low water can be carried, (after passing the bar,) passes close under the western shore to abreast of the town. The eastern bank is rather higher than the western, slightly undulating, grassy, and for the most part under cultivation.

Abreast of the town and nearly in the middle of the river lies a marsh island, very irregular in shape and about nine hundred yards long N N W. and S S E. At low water it is joined to the eastern bank by the bare mud flats, and the channel passes on its western side between it and the town. Three-quarters of a mile above this island the river is crossed by the county bridge, and a quarter of a mile above this is the railroad bridge. Both banks above the town are undulating and grassy, but the eastern bank is much the higher of the two.

DANGERS

IN APPROACHING STRATFORD HARBOR.

I. *From the Eastward.*—As above remarked strangers cannot enter the Housatonic River. The only danger met with on approaching from the eastward is Stratford Bar, which extends across the mouth of the river with not more than two feet at low water, and forms an insurmountable barrier to farther progress without a pilot. A black spar-buoy, marked No. 1, is placed on this bar in six feet at low water, with Stratford Point Light-house bearing SW., distant Stratford Bar about five-eighths of a mile. Strangers must not approach this buoy from the eastward nearer than a quarter of a mile, where they must anchor in from three and a half to four fathoms and wait for a pilot. Half a mile to the westward of this buoy will be seen a grey stone beacon sur-

mounted by an iron spindle and ball painted black. This is known as **Stratford Beacon** and marks the western limits of the bar channel,—being placed upon the eastern edge of the dry mud flats which make off from the western bank. The beacon is five-eighths of a mile **N. $\frac{1}{2}$ E.** from Stratford Point Light-house.

SAILING DIRECTIONS

FOR APPROACHING STRATFORD HARBOR.

I. From the Eastward.—**1. From off New Haven.**—On the course **W. by S. $\frac{1}{2}$ S.** for Stratford Point Light-house, when within a mile and a half of it, in five fathoms, and Stratford Beacon bears **W. $\frac{3}{4}$ N.**, nearly a mile and a half distant, steer for the beacon and anchor when within five-eighths of a mile of it in from three and a half to four fathoms at low water. The lead must be kept well in hand in approaching the bar and the proper signal made for a pilot as soon as it can be recognized from the shore.

2. On the W. by S. $\frac{1}{8}$ S. course from between Falkner's Island and Indian Reef.—Bring Stratford Point Light-house to bear **W. by N. $\frac{3}{8}$ N.**, distant five miles and a half, and Middle Ground Light-house **SW. by W. $\frac{1}{4}$ W.**, distant seven miles, and steer **NW. by W. $\frac{3}{4}$ W.**, which course will bring you up with the black spar-buoy at the entrance to the channel. Anchor off the bar in from three and a half to four fathoms at low water and make signal for a pilot.

DANGERS

IN APPROACHING STRATFORD HARBOR.

II. From the Westward.—In approaching Stratford Point from the westward be careful to give it a berth to the northward of not less than a mile and a quarter, on account of the shoal water which makes off to the southward from the shore between the point and Bridgeport Entrance. **Stratford Point Shoal.** The general name, Stratford Point Shoal, is given to the whole area of this shoal ground; and a red spar-buoy, marked No. 16, is placed on the southern side of a *nine feet shoal* on its southern boundary. From this buoy Stratford Point Light-house bears **NE. $\frac{1}{2}$ E.**, a mile and five-eighths; Middle Ground Light-house **S. $\frac{1}{2}$ E.**, four miles and a quarter; and Penfield's Reef Light-house **W. $\frac{1}{4}$ S.**, four miles and three-eighths distant. To avoid the shoal at night do not go to the northward of Penfield's Reef Light-house bearing **W. $\frac{1}{4}$ N.**

When past Stratford Point Shoal no dangers are met with until you are up with the bar. Stratford Point may be approached on its eastern side within eight hundred yards with not less than four fathoms; and when abreast of the light-house the black spar-buoy on the bar will be seen bearing about **N. $\frac{3}{4}$ E.** and five-eighths of a mile off. As before mentioned, it is necessary to anchor off this buoy and wait for a pilot.

SAILING DIRECTIONS

FOR APPROACHING STRATFORD HARBOR.

II. From the Westward.—Continue the **E. by N. $\frac{1}{8}$ N.** course from off Sands' Point until you come abreast of the red spar-buoy off Stratford Point Shoal, with the light-house bearing **NE. $\frac{3}{8}$ N.**, distant a mile and three-quarters, and Middle Ground Light-house **S. $\frac{1}{2}$ E.**, distant four miles. Now steer **NE. $\frac{1}{4}$ E.**, carrying not less than fourteen feet, until you come abreast of Stratford Point Light-house, having it bearing **NW. $\frac{3}{4}$ N.**, distant seven hundred and fifty yards, when the bar buoy will bear **N. by E. $\frac{1}{2}$ E.**, distant three-quarters of a mile, and **NE. by N.** will lead to the anchorage off the bar.

The above courses pass a quarter of a mile to the southward of the red spar-buoy on Stratford Point Shoal; three-eighths of a mile to the eastward of Stratford Point; and a quarter of a mile to the eastward of the bar buoy.

Or, on the E. by N. $\frac{1}{8}$ N. course for the North Channel from off Eaton's Point.—When Stratford Point Light-house bears **NE. by N. $\frac{1}{2}$ N.**, distant three miles and three-quarters, and Middle Ground Light-house **SE. by S. $\frac{3}{8}$ S.**, distant two miles and a quarter, steer **NE. by N.**, which course will lead to the anchorage off the bar.

The above course passes three-quarters of a mile to the eastward of the red spar-buoy on Stratford Point Shoal; seven hundred and fifty yards to the eastward of Stratford Point; and a quarter of a mile to the eastward of the bar buoy.

LIGHT-HOUSE.

NAME.	Latitude.	Longitude W.		Fixed or Revolving.	Interval of Flash.	Height above sea-level.	Distance visible in nautical miles.
		In arc.	In time.				
	° ' "	° " "	h. m. s.		m. s.	Feet.	
Stratford Point Light-house	41 9 5	73 6 13	4 52 25	Revolving.	1 30	53	12

BRIDGEPORT HARBOR.

This harbor lies at the mouth of the **Pequannock River**, which empties into the bight between Stratford and Shoal points, a little over three miles to the westward of the former. At its mouth the river is seven-eighths of a mile wide, between Long Beach Point on the east and Park Point on the west; but most of this area is occupied by shoals, leaving only a very narrow channel with twelve feet at low water.

Long Beach Point, the eastern point of entrance, is a low, flat sand beach, with a few houses near its northern end and a long breakwater of stone extending from it to the westward. This breakwater is about four hundred and fifty yards long, and was built by the United States Engineers for the purpose of increasing the depth of the channel—an object which it has not yet accomplished.

Park Point, the western point of entrance, is composed of low and nearly level land, thickly dotted with clumps of trees,—the whole forming what is locally known as **Sea-side Park**, belonging to the city of Bridgeport.

On the northern side of Long Beach Point makes in what is called **The Gut**,—a wide but shallow stream, which takes its rise in the hills back of Stratford and flows in a southwesterly direction into Long Island Sound, at the entrance to the harbor.

Above the mouth of The Gut the shore runs about NW. by W. for five-eighths of a mile to the entrance to a large pond, which is shut off from the harbor by a causeway. The southern point of entrance to the shallow cove leading up to this causeway is known as **Cook's Point**, and is composed almost entirely of marsh, backed by level lands well cultivated and settled. The northern point forms the southern extremity of **East Bridgeport**, and is known as **Mathers' Dock** from the large wharf at its southwestern end. It is level land, thickly settled,—the houses being surrounded by ornamental grounds.

About three hundred and fifty yards above Mathers' Dock the river is crossed by a drawbridge—the opening in which is near the western shore; and about nine hundred yards above this bridge is the eastern end of the railroad bridge, which carries the New York and New Haven Railroad.

On the western bank of the river, about half a mile above Park Point, is Wells' Point, sometimes called **The Tongue**, which forms the southeastern extremity of the city of Bridgeport. It is a flat grassy point, thickly dotted with houses, and there is a wooden beacon, in the shape of a pyramid, on the eastern edge of the flats, about four hundred and fifty yards from it. The city of **Bridgeport** occupies the whole of the western bank of the river from Wells' Point to about half a mile above the lower bridge. It is a thriving town, celebrated for its manufactures,—notably those of sewing-machines,—and is rapidly increasing in wealth and importance.

The most prominent object in approaching this harbor is the light-house, known as **Bridgeport Harbor Light-house**, a screw pile structure built upon the southeastern extremity of the long shoal making off from Park Point. It is supported upon a stone foundation, and is in the shape of a white dwelling-house with mansard roof, supporting a low tower,—the whole building, with the exception of the roof, being painted white. It shows a fixed red light, of the fourth order, from a height of fifty-six feet above the sea, visible twelve miles and three-quarters. Its geographical position is

Latitude ----- 41° 9' 24" N.
Longitude ----- 73° 10' 48" W.,

and it bears from Middle Ground Light-house N NW., six miles and five-eighths; from the red buoy on Stratford Point Shoal NW. ¼ W., two miles and seven-eighths; and from Old Field Point Light-house N. ¼ W., eleven miles distant. From this light-house Penfield's Reef Light-house bears nearly SW. ¼ W., three miles, and Black Rock Light-house W. by S. ¼ S., distant nearly two miles.

A bell is struck by machinery every fifteen seconds during thick weather.

DANGERS

IN APPROACHING AND ENTERING BRIDGEPORT HARBOR.

I. **From the Eastward.**—In approaching Bridgeport Harbor from the eastward beware of Stratford Point Shoal, which makes off to the southward from the shore, between Stratford Point and Long Beach Point, for about a mile. Nine feet at low water is found upon this shoal seven-eighths of a mile from shore, and here is placed a red spar-buoy (No. 16) in fifteen feet water,—Stratford Point Light-house bearing NE. ¼ E., distant one mile and five-eighths; Bridgeport Harbor Light-house NW. ¾ W., two miles and seven-eighths; and

Penfield's Reef Light-house $W. \frac{1}{8} S.$, four miles and three-eighths distant. When past this buoy do not approach either shore until up with the light-house; and if beating in do not stand to the westward farther than to bring Black Rock Light-house to bear $N. \frac{1}{4} W.$ in order to avoid the shoals off Shoal Point, which are known as Fairfield Bar, Penfield's Reef and The Cows.

Fairfield Bar is a very narrow sand spit, a little over a mile long and dry at low water, extending about $SE.$ by $E. \frac{1}{4} E.$ from Shoal Point, (the eastern extremity of Fairfield Beach.) About two hundred and fifty yards to the northeastward of its southeastern end lies a group of rocks,

Penfield's Reef some bare and some awash at low water, called *The Cows*; and on its southern side is **Light-house.** *Penfield's Reef*, with from one to two feet at low water, upon which is built Penfield's Reef Light-house, a one-story grey house with mansard roof, surmounted by a low tower and lantern painted white. The building is supported by a pier of dark granite, and shows a red light, of the fourth order, (flashing at intervals of five seconds,) and visible thirteen miles. Its geographical position is

Latitude ----- $41^{\circ} 7' 3'' N.$
Longitude ----- $73^{\circ} 13' 11'' W.,$

and it bears from

	Miles.
Black Rock Light-house, S. by $W. \frac{1}{2} W.$ Nearly -----	about $1 \frac{1}{2}$
Bridgeport Harbor Light-house, $SW. \frac{1}{4} W.$ Nearly -----	3
Stratford Point Light-house, $W.$ by $S. \frac{1}{8} S.$ -----	nearly $5 \frac{3}{4}$
Middle Ground Light-house, $NW. \frac{1}{2} W.$ -----	$6 \frac{3}{8}$
Old Field Point Light-house, $N NW.$ Northerly -----	$9 \frac{1}{2}$
Norwalk Light-house, $E.$ by $N. \frac{1}{2} N.$ -----	nearly 10
Eaton's Neck Light-house, $NE. \frac{1}{4} E.$ -----	about $12 \frac{1}{2}$

A bell is struck by machinery, two quick blows at intervals of twenty seconds, during thick weather.

When to the northward of Fairfield Bar and The Cows vessels beating into Bridgeport must beware of Point Rock Shoal,—the name given to the shoal water extending off to the southward from *Point Rock*, a rock awash at low water, lying about three hundred yards to the southward of **Fairweather Island**, on the eastern side of the entrance to Black Rock Harbor. Point Rock Shoal has about eight feet at low water, and a red spar-buoy (No. 2) is placed on its southern side in two fathoms as a guide to the entrance to Black Rock Harbor.

Fairweather Island should not be approached from the eastward, by vessels bound into Bridgeport Harbor, nearer than three-eighths of a mile, in order to avoid *the shoals off its eastern shore*; but beyond this, and until the light-house is reached, the lead is the only proper guide. Both shores shoal gradually, but strangers are warned not to pass to the eastward of Bridgeport Harbor Light-house bearing $N NW.$ until up with it.

When abreast of the light-house a wooden pyramid, surmounted by a spar and cask, will be seen nearly three-eighths of a mile off, bearing about $N.$ by $E. \frac{1}{2} E.$ This is called **Outer** or **Southwest Beacon** and marks the eastern extremity of *the flats off Sea-side Park*,—bearing from the northern end of Long Beach Point $W. \frac{1}{8} N.$, a little over half a mile, and from the light-house $N.$ by $E. \frac{1}{4} E.$ seven hundred yards distant. The course from abreast of the light-house is nearly for this beacon, with the tall brick smoke-stacks of the factories in East Bridgeport on each side of it; and on this course there will soon be seen another wooden pyramid, known as the **Inner** or **Northeast Beacon**, which is also on the western side of the channel and is to be left to the westward.

It must also be remarked that six hundred yards to the northeastward of Penfield's Reef Light-house, and exactly off the eastern end of Fairfield's Bar, there is placed an iron spindle painted red and surmounted by a large cage. This is called **Black** or **Huncher's Rock Beacon**, and serves as a warning to keep vessels from approaching The Cows.

The western extremity of the East Flats, which make off from Long Beach with from two to four feet water upon them, is marked by a red spar-buoy (No. 2) placed in ten feet water **East Flats.** about an eighth of a mile to the southeastward of the light-house. The channel passes directly between the two, and the range of the Southwest Beacon between the two tall chimneys in East Bridgeport will clear the flats.

On approaching Southwest Beacon a red spar-buoy will be seen on the eastern side of the channel and about one hundred yards to the southwestward of the beacon. This is on the northwestern extremity of the East Flats, is marked No. 4, and is known as the "**Southwest Buoy**," marking the turning point in the channel, which takes a northeasterly course from between Southwest Beacon and this buoy and leads directly towards another red spar-buoy placed on the northern side of the entrance to The Gut. The sailing-line passes about one hundred yards to the eastward of the Inner or Northeast Beacon and approaches to within seventy-five yards of the buoy, which is marked No. 6, and is



View off Stratford Point, the Light bearing N.W. by W. distant 2 1/2 Miles.

Entrance to Harbour of Cape
Cape 1811

Barred Pt.
1811



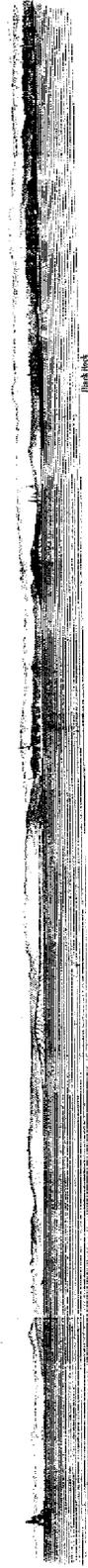
Entrance to Bridgport Harbour, the Light bearing N.E. distant 1 1/2 Miles.

Catharine Church

Wakarusa Hill

Light House

Black Hook



Entrance to Black Hook Harbour, Black Hook Light bearing S.W. by W. distant 2 Miles.

Entrance
of the Bay

Black Hook
1811

known as the "Turning-point Buoy." Here the channel turns abruptly to the northwestward, running directly for Mathers' Dock, nearly in range with which will be seen a black spar-buoy (No. 1), marking *the eastern extremity of the flats off Corner Dock*, abreast of the city. No directions can be given for avoiding the flats between the Inner Beacon and **Corner Dock**, except to watch the range of this buoy with the outer or western end of Mathers' Dock and neither to shut it in nor open it out beyond the wharf. The harbor cannot be entered by sailing vessels of any size except with a fair wind or the assistance of a tug-boat, as the channel is too narrow to afford beating room and the edge of the flats is abrupt.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING BRIDGEPORT HARBOR.

I. From the Eastward.—1. From off New Haven.—When off New Haven Entrance, with Southwest Ledge Light-house bearing **N.** by **W.** $\frac{3}{4}$ **W.**, distant three-quarters of a mile, and New Haven Tower **N.** $\frac{3}{4}$ **E.** **Easterly**, distant one mile and a half, steer **WSW.**, which course will lead, with not less than three and three-quarter fathoms, past Stratford Point and up with the red buoy on Stratford Point Shoal. When past this buoy, having it bearing **N.** $\frac{3}{4}$ **E.**, distant eleven hundred yards, Penfield's Reef Light-house **W.** $\frac{1}{2}$ **N.**, and Bridgeport Harbor Light-house **NW.** $\frac{1}{4}$ **N.**, steer **NW.** by **W.** $\frac{1}{4}$ **W.** for about two miles, until Penfield's Reef Light-house bears **W.** by **S.** $\frac{1}{4}$ **S.** and Bridgeport Harbor Light-house **N.** by **W.** $\frac{3}{8}$ **W.** Here you will have three and a half fathoms, and must steer for the harbor light-house until within half a mile of it and Outer or Southwest Beacon becomes visible. Now steer to the westward until you bring this beacon to bear **N.** $\frac{1}{2}$ **E.**, when it will be exactly between two tall chimneys in East Bridgeport and you must steer in on that range, passing midway between the light-house and the red buoy on the eastern end of East Flats and to the westward of Southwest Buoy. On this course, when past the latter and within about fifty yards of Southwest Beacon haul to the northeastward, steering about **NE.** $\frac{1}{4}$ **E.** for Turning-point Buoy. Continue this course until past the Inner Beacon and within about seventy-five yards of Turning-point Buoy, when steer **NW.** by **N.** **Northerly**, exactly for the southwestern extremity of Mathers' Dock, with the black spar-buoy on the flats off Corner Dock just touching it. Keep this range until nearly up with the buoy, when pass to the northward of it, about midway between it and Mathers' Dock, and steer over towards the wharf-line of the city, where you may anchor in from six to ten feet at low water.

Twelve feet at mean low water may be carried up to the city through a channel one hundred feet wide, dredged by the U. S. Engineers.

The above courses pass eleven hundred yards to the southward of the red buoy on Stratford Point Shoal; five-eighths of a mile to the westward of the southwestern edge of that shoal; about sixty yards to the westward of the red spar-buoy on the western end of East Flats; seventy-five yards to the eastward of the light-house; fifty yards to the westward of the Southwest Buoy; the same distance to the eastward of Outer Beacon; a little over one hundred yards to the eastward of Inner Beacon; seventy-five yards to the westward of Turning-point Buoy; and about fifty yards to the northward of the black buoy on the flats off Corner Dock.

2. Having come through the main passage of the North Channel of Long Island Sound.—

On the **W.** by **S.** $\frac{1}{8}$ **S.** course, when Stratford Point Light-house bears **NE.** by **N.** $\frac{1}{2}$ **N.**, distant three and three-quarter miles, and Middle Ground Light-house **SE.** by **S.** $\frac{3}{8}$ **S.**, two miles and a quarter distant, Bridgeport Harbor Light-house will bear **N.** by **W.** $\frac{1}{8}$ **W.**, and that course must be steered until you are within three-quarters of a mile of the light-house, when you must bring the Outer Beacon midway between the two tall chimneys in East Bridgeport on a bearing of **N.** $\frac{1}{2}$ **E.** and steer in on that range, following the directions given above.

DANGERS

IN APPROACHING AND ENTERING BRIDGEPORT HARBOR.

II. From the Westward.—In approaching this harbor from the westward the first danger met with will be Penfield's Reef; but vessels in beating must be careful, when between the Norwalk Islands and the entrance to Black Rock Harbor, not to stand farther to the northward than to bring Penfield's Reef Light-house to bear **E.** by **N.** $\frac{1}{2}$ **N.** to avoid Pine Creek Point Shoal, which is dry at low water and extends to the southward from Pine Creek

*Pine Creek
Point Shoal.*

Point for about half a mile. There are many rocks upon this shoal which are out at half tide, and a red spar-buoy has been placed off its southern end for the convenience of vessels beating through the Sound or entering Southport Harbor.

Penfield's Reef, which is marked by the light-house already described on page 458, is a shoal, with from one to two feet upon it at mean low water, lying just to the southward of the eastern extremity of Fairfield Bar.

Fairfield Bar is a very narrow sand spit, a little over a mile long and dry at low water, extending from Shoal Point (the western point of entrance to Black Rock Harbor) in a direction about SE. by E. $\frac{1}{4}$ E. and forming a natural breakwater. About two hundred and fifty yards to the northeastward of its eastern end lies a group of rocks, some bare and some awash at low water, called *The Cows*, and two hundred and fifty yards to the eastward of the same end lies *Black* or *Huncher's Rock*, which is marked by a spindle composed of iron screw-piles surmounted by a large cage,—the whole being painted red. This spindle is generally known as *Black Rock Beacon* and is a very important guide to the entrance to Black Rock Harbor. It bears from Penfield's Reef Light-house NE. $\frac{1}{2}$ E., distant about six hundred yards.

When past Black Rock there are no dangers in the channel until up with Bridgeport Bar; but if beating in you should not stand farther to the westward than to bring Bridgeport Harbor Light-house to bear NE. by E. or Penfield's Reef Light-house SW. by S. in order to avoid the shoals making off to the southward from *Fairweather Island*. From the southern end of this island there extends a reef of rocks, in a direction nearly due S., for about two hundred and fifty yards, bare in some places and awash in many at low water. On the southern extremity of this reef is *Point Rock*, awash at low

Point Rock Shoal.

water, lying due S. from Black Rock Light-house, distant four hundred yards; and shoal water extends to the southward from it about three hundred and fifty yards farther and is generally known as *Point Rock Shoal*. A red spar-buoy (No. 2) is placed in two fathoms on this shoal and bears from Penfield's Reef Light-house N. by E. $\frac{3}{4}$ E., a mile and an eighth; from Black Rock Light-house S. $\frac{3}{4}$ W., six hundred yards; and from Bridgeport Harbor Light-house SW. by W. $\frac{3}{4}$ W., a little over two miles distant. When to the northeastward of this buoy there are no dangers until you reach Bridgeport Bar, for description of which, and the dangers in the harbor, see pages 458-459.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING BRIDGEPORT HARBOR.

II. *From the Westward*.—When between Eaton's Neck and Sheffield Island, having Norwalk Light-house bearing N. $\frac{1}{4}$ W., distant two miles and three-eighths, and Eaton's Neck Light-house S. $\frac{1}{4}$ E., distant a little over three miles and a quarter, the course is E. by N. $\frac{1}{8}$ N., which will lead past the Norwalk Islands and clear of all dangers until you come abreast of Pine Creek Point. Here you will have about ten fathoms, with Penfield's Reef Light-house bearing NE. by N. $\frac{3}{8}$ N., distant nearly two miles and a half, and seen nearly midway between Bridgeport Harbor Light-house and Black Rock Light-house,—the former bearing NE. $\frac{1}{2}$ N. and the latter NE. by N. $\frac{3}{4}$ N. From this position steer NE. until within three-quarters of a mile of Bridgeport Harbor Light-house, with the Outer Beacon bearing N. $\frac{1}{2}$ E. and seen exactly midway between the two tall factory chimneys in East Bridgeport. Steer in on this range and follow the directions previously given for the harbor.

The above courses pass five-eighths of a mile to the eastward of Penfield's Reef Light-house; the same distance to the eastward of Black Rock Beacon; nearly three-quarters of a mile to the eastward of *The Cows*; and about a mile and a quarter to the eastward of the red buoy on *Point Rock Shoal*.

Or, with Penfield's Reef Light-house bearing NE. by N. $\frac{3}{8}$ N. and Bridgeport Harbor Light-house NE. $\frac{1}{2}$ N., as before, steer for the latter until within about one-third of a mile of it, when haul to the eastward, bring the Outer Beacon between the two tall chimneys above mentioned, and steer into the harbor as above directed.

The above course passes three-eighths of a mile to the eastward of Penfield's Reef Light-house; about a third of a mile to the eastward of Black Rock Beacon; eight hundred yards to the eastward of *The Cows*; and a little over three-quarters of a mile to the eastward of the red spar-buoy on *Point Rock Shoal*.

BLACK ROCK HARBOR

is formed by a cove of irregular shape lying at the confluence of two shallow streams and about two miles to the westward of Bridgeport Entrance. The eastern side of the harbor is protected by *Fairweather Island*, a long, low, narrow island with a white light-tower on its southern end. It is about three-quarters of a mile long N. by E. and S. by W., very irregular in shape and for the most part covered at high water. Its northern end, which lies

Fairweather Island.

abreast of the village of **Black Rock**, is about six hundred yards to the southwestward of **Short Beach Point**, (the western end of **Short Beach**,) with which it is connected at low water; and from this northern end the island is covered at high water to within half a mile of the light-house. There are in fact two islets joined by a rocky reef, and it is on the southernmost of the two (which is never covered) that the light-house is built. This southern island is composed of marsh and grass, destitute of trees, but has one or two houses upon it. **Black Rock Light-house** is a stone tower thirty-three feet high, standing near the southwestern end of Fairweather Island, and shows a fixed white light, of the fifth order, from a height of forty-three feet above the sea, visible twelve miles. Its geographical position is

Latitude 41° 8' 30" N.
Longitude 73° 13' 4" W.,

and it bears from Penfield's Reef Light-house **N. by E. $\frac{1}{2}$ E. Nearly**, about a mile and a half; from Middle Ground Light-house **NW. $\frac{1}{2}$ N.**, a little over seven miles; and from Bridgeport Harbor Light-house **W. by S. $\frac{1}{2}$ S.**, nearly two miles distant.

On its southern side Black Rock Harbor is protected by a long narrow sand spit called **Fairfield Bar**. It extends to the southeastward from Shoal Point for a little over a mile, and **Penfield's Reef Light-house** is built a little to the southward of its eastern end. (See also page 458.)

Shoal Point is a mere flat sand point backed by marsh, and forms the western point of entrance to Black Rock Harbor. The western shore extends to the northward from this point in a nearly **NE. by N.** direction for about a mile to the mouth of a very narrow and shallow stream called **Fairfield Creek**. This shore is all low, being composed of a flat sand bench backed by marsh, behind which is seen a cultivated and thickly settled country. The spires and houses in the village of **Fairfield** are especially prominent. **Shoal Point.**

To the westward of the mouth of **Fairfield Creek** the shore-line takes an abrupt turn nearly **E SE.** for about a quarter of a mile and then nearly **NE.** for three-eighths of a mile, thus skirting the base of a smooth gently sloping hill between sixty and seventy feet high called **Grover's Hill**. On approaching the harbor from the eastward Fairweather Island will appear in range with this hill. Its surface shows many cultivated fields, interspersed with orchards, small clumps of trees and handsome houses, but its summit is covered only with grass. The village of **Black Rock** lies at the base of this hill, on its eastern side, and extends along the western shore of the harbor for about three-quarters of a mile to what is called **The Cove**. **Grover's Hill.**

Anchorage is found in Black Rock Harbor in from ten to twelve feet and abreast of the village in from six to eight feet, but strangers must not attempt to reach this latter anchorage. The harbor is nearly half a mile wide between Fairweather Island and Grover's Hill, but becomes gradually narrower towards its head, where, abreast of the village, it is only about one hundred and fifty yards wide. It is, however, almost entirely unobstructed as far up as the usual anchorage,—it being only necessary to keep in mid-channel after rounding the buoy on Point Rock Shoal.

DANGERS

IN APPROACHING AND ENTERING BLACK ROCK HARBOR.

When abreast of the red buoy on Stratford Point Shoal, with Stratford Point Light-house bearing **NE. $\frac{1}{2}$ N.**, distant two miles, and Penfield's Reef Light-house **W. $\frac{1}{2}$ N.**, distant four miles and three-eighths, Bridgeport Harbor Light-house will bear **NW. $\frac{1}{4}$ N.** and Black Rock Light-house **NW. by W. $\frac{3}{4}$ W.** Here you will have about four fathoms and must steer **W. by N. $\frac{1}{4}$ N.**, which will lead, with not less than three and a half fathoms, to the entrance to the outer harbor. When nearly up with the entrance a red spar-buoy will soon be seen well to the northward of the course, bearing about **NW. $\frac{1}{4}$ N.** and about three-quarters of a mile off. This is on Point **Point Rock Shoal.** Rock Shoal, making off to the southward from Fairweather Island, and already described in the approaches to Bridgeport Harbor. (See pages 458 and 460.) The buoy is marked No. 2, placed in two fathoms on the shoal,—Black Rock Light-house bearing **N. $\frac{3}{4}$ E.**, distant six hundred yards, and Penfield's Reef Light-house **S. by W. $\frac{3}{4}$ W.**, distant one mile and an eighth. The course passes well to the southward of it.

On the southern side of the entrance, and about a quarter of a mile to the northeastward of Penfield's Reef Light-house, will be seen a spindle and large cage supported on iron screw-piles,—the whole being painted red. This is known as **Black or Huncher's Rock Beacon**, and is built upon **Black Rock**, which lies about two hundred and fifty yards to the eastward of the eastern end of **Fairfield Bar** and about six hundred yards to the northeastward of Penfield's Reef Light-house. This beacon bears from that light-house **NE. $\frac{1}{2}$ E.**; from Black Rock Light-house **S. $\frac{3}{4}$ W.**; and from the red buoy on Stratford Point Shoal **W.** **Black Rock.**

About an eighth of a mile to the northward of Black Rock Beacon lies a group of rocks, some bare and some awash at low water, called **The Cows**. This reef makes off to the northeastward from the eastern extremity of **Fairfield Bar** and has already been described in the approaches to Bridgeport Harbor. It always shows itself, and Black Rock Beacon is a sufficient guide to keep vessels away from it in the day-time; but at night, when in its vicinity, they should not go to the southward of Stratford Point Light-house bearing **E. $\frac{1}{2}$ N.** (See also pages 458 and 460.) **The Cows.**

When fairly between Point Rock Shoal buoy and Black Rock Beacon the course turns abruptly to the northward, passing to the westward of the buoy; and there are no dangers as far up as the anchorage, except *the flats making off from both shores*. Fairweather Island, abreast of the light-house, should receive a berth to the eastward of not less than two hundred yards; and the southern end of Grover's Hill, on the opposite shore, should not be approached nearer than four hundred yards.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING BLACK ROCK HARBOR.

I. From the Eastward.—1. From off Stratford Point.—When abreast of the red buoy on Stratford Point Shoal, with the light-house bearing **NE. $\frac{1}{2}$ N.**, distant two miles, and Penfield's Reef Light-house **W. $\frac{1}{2}$ N.**, distant four miles and three-eighths, Bridgeport Harbor Light-house will bear **NW. $\frac{1}{4}$ N.** and Black Rock Light-house **NW. by W. $\frac{3}{4}$ W.** Here there will be about four fathoms, and **W. by N. $\frac{1}{4}$ N.** will lead, with not less than three and a half fathoms, about midway between The Cows and the red buoy on Point Rock Shoal. On this course, when Black Rock Light-house bears **N. $\frac{5}{8}$ E.** (with Point Rock Shoal buoy in range with it) and Penfield's Reef Light-house **SW. by S. $\frac{3}{4}$ S.**, steer **N. by W.**, which course will lead into the harbor with not less than eleven feet at low water. When abreast of the light-house, having it bearing **E. by N.**, distant four hundred yards, steer **N. by E. $\frac{3}{4}$ E.**, carrying not less than ten feet, and anchor with the light-house bearing anywhere between **SE.** and **S. by E. $\frac{1}{4}$ E.**

The above courses pass a little over half a mile to the southward of the red buoy on Stratford Point Shoal; the same distance to the northward of Black Rock Beacon; three-eighths of a mile to the northward of The Cows; eight hundred yards to the southward, and two hundred yards to the westward, of the red buoy on Point Rock Shoal; three hundred yards to the eastward of the flats off Grover's Hill; and about four hundred yards to the westward of Black Rock Light-house.

Or, with the wind to the southward, you may continue the **W. by N. $\frac{1}{2}$ N.** course until the light-house bears **NE. $\frac{1}{2}$ N.**, and anchor in from sixteen to eighteen feet under the shelter of Fairfield Bar.

2. To enter from the Eastward, having come through the main passage of the North Channel of Long Island Sound.—On the **W. by S. $\frac{1}{8}$ S.** course from between Falkner's Island and Indian Reef, when just past Middle Ground Light-house, with Stratford Point Light-house bearing **NE. by N. $\frac{1}{2}$ N.**, distant three miles and three-quarters, and Middle Ground Light-house **SE. by S. $\frac{5}{8}$ S.**, distant two miles and a quarter, Penfield's Reef Light-house will bear **NW. by W. $\frac{1}{2}$ W.** and Black Rock Light-house **NW.**; and **NW. $\frac{1}{2}$ W.** will lead, with not less than three and a half fathoms, to the entrance to the harbor. On this course, when Black Rock Light-house bears **N. $\frac{5}{8}$ E.**, distant nearly three-quarters of a mile, and Penfield's Reef Light-house **SW. by S. $\frac{3}{4}$ S.**, distant three-quarters of a mile, the former will be in range with the red buoy on Point Rock Shoal and **N. by W.** must be steered towards the eastern base of Grover's Hill, following the directions given above.

The **NW. $\frac{1}{2}$ W.** course for the entrance to the harbor passes half a mile to the northward of Black Rock Beacon; three-eighths of a mile to the northward of The Cows; and eight hundred yards to the southward of Point Rock Shoal buoy.

Or, on the NW. $\frac{1}{2}$ W. course, when Black Rock Light-house bears **N. $\frac{5}{8}$ E.** and Penfield's Reef Light-house **SW. by S. $\frac{3}{4}$ S.**, as before, steer **W. by N. $\frac{1}{2}$ N.**, and anchor under shelter of Fairfield Bar in from sixteen to eighteen feet.

II. To enter Black Rock Harbor from the Westward.—On the **E. by N. $\frac{1}{8}$ N.** course through the Sound, when between Sheffield Island and Eaton's Neck, with Norwalk Light-house bearing **N. $\frac{1}{4}$ W.**, distant two miles and three-eighths, and Eaton's Neck Light-house **S. $\frac{1}{4}$ E.**, distant a little over three miles and a quarter, continue the course, as though intending to enter the Thimbles Channel, until Penfield's Reef Light-house bears **NE. by N. $\frac{3}{8}$ N.**, distant two miles and three-eighths, and Bridgeport Harbor Light-house **NE. $\frac{1}{2}$ N.**, distant five miles and a quarter, when steer for the latter, carrying not less than six and a half fathoms, until Penfield's Reef Light-house bears **W. by N.**, distant half a mile, and Black Rock Light-house **N. $\frac{1}{4}$ W.** Now steer **N. by W.** for the eastern base of Grover's Hill and follow the directions given for the harbor.

The above courses pass nearly half a mile to the eastward of Penfield's Reef Light-house; four hundred yards to the eastward of Black Rock Beacon; three hundred yards to the eastward of The Cows; and about two hundred yards to the westward of Point Rock Shoal buoy.

LIGHT-HOUSES.

NAME.	Latitude.			Longitude West.			Fixed or Revolving.	Interval of Flash.	Height above sea-level.	Distance visible in nautical miles.			
				In arc.		In time.							
	°	'	"	°	'	"					h.	m.	s.	m.	s.	Feet.
Bridgeport Harbor Light-house	41	9	24	73	10	48	4	52	43.2	Fixed red.	-----	56	12½
Black Rock Light-house	41	8	30	73	13	4	4	52	52.3	Fixed.	-----	43	12
Penfield's Reef Light-house	41	7	3	73	13	11	4	52	53.0	Fl'g red.	0 5	54	13

TIDES.

Corrected Establishment	11 ^h 11 ^m
Mean Rise and Fall of tides	6.5 ft.
Mean Rise and Fall of Spring tides	8.0 ft.
Mean Rise and Fall of Neap tides	4.7 ft.
Mean duration of Rise	6 ^h 1 ^m
Mean duration of Fall	6 ^h 7 ^m
Mean duration of Stand	0 ^h 30 ^m
Rise of highest tide observed	8.8 ft.

VARIATION OF THE COMPASS.

The magnetic variation off Bridgeport Entrance for 1880 is 8° 30' W., with an approximate annual increase of about 2½'.

PORT JEFFERSON HARBOR.

This harbor lies on the southern side of the Sound, directly opposite to Bridgeport, the entrance bearing S. by E. from Bridgeport Harbor Light-house. It is the first harbor met with, on this side of the Sound, to the westward of Plum Gut, is fit only for vessels of light draught, and cannot be entered by strangers, being barred at its mouth by a shoal extending across the entrance with not more than three feet upon it at low water. Once over the bar, however, the harbor affords excellent anchorage in from three to five fathoms at low water and completely land-locked.

The harbor is formed by a cove of irregular shape making into the northern shore of Long Island in about a S SE. direction for a mile and a half, and the village of Port Jefferson is situated at its head. The entrance is very narrow,—being only about one hundred yards wide; but the anchorage ground inside the bar has an average width of about half a mile.

The eastern point of entrance is formed by a long flat sand spit, called **East Beach**, making to the westward from **Mount Misery Point**; while the western point of entrance is formed by the eastern extremity of **Setauket Beach**, a narrow strip of sand extending to the southeastward from **Old Field Point**. The narrow entrance embraced between these points is protected by two jetties or breakwaters extending in a northwesterly direction. The eastern jetty extends from the eastern point of entrance about two hundred and fifty yards, and it is proposed to prolong it to the edge of the nine feet curve, which will give it a whole length of three hundred and fifty yards. In 1877 this jetty was in such a dilapidated condition as to render an entrance to the harbor impossible during easterly gales, as the sea made a clean breach over it and prevented ingress or egress. It is not known whether it has since been put in thorough repair.

The western jetty is in thorough repair, and is about one hundred and sixty yards long and its summit four feet above high water. It will probably be prolonged two hundred yards farther. This jetty extends from the eastern end of **Setauket Beach** in a northwesterly direction, and the best water in crossing the bar is about midway between it and the eastern jetty.

On the western end of **East Beach** is placed a small bug light, sustained by private enterprise for the convenience of vessels using this harbor, especially the steam packet plying between this harbor and Bridgeport.

The shores of the harbor are about equally divided between wooded and cleared lands. The eastern shore is almost all wooded,—being formed by a wooded hill, about one hundred and eighty feet high, called **Mount Misery**.

The western face of the hill presents steep cliffs from twenty to forty feet high, with outcropping bare ledges here and there; and behind this a rather gentle rise to its wooded summit. The western shore, which is called **Dyer's Neck**, shows an almost unbroken line of thick woods,—the land rising to a height of one hundred and forty feet, with cleared summits. This shore also shows steep faces from twenty to forty feet high. The village of **Port Jefferson** occupies the whole of the southern shore and a small portion of the western shore.

At the northwestern extremity of **Dyer's Neck** makes in a narrow, crooked and very shallow inlet called **Setauket Harbor**. It is contained between **Dyer's Neck** on the east and **Strong's Neck** on the west, and has an average width of between two hundred and fifty and three hundred yards, with a depth in its extremely narrow and crooked channel of not less than three feet at mean low water.

Strong's Neck is a long peninsula making to the northward from the mainland for about one mile and a quarter,—its northern extremity coming within two hundred and fifty yards of **Setauket Beach**. It is almost entirely under cultivation, and presents an undulating outline varying in height from ten to eighty feet, with gentle slopes, and diversified with alternate grass lands, cultivated fields and small groves of trees. **Miller's Point**, its eastern extremity, **Strong's Neck**.

which also forms the western point of entrance to Setauket Harbor, is remarkable as a round thinly wooded hill terminating to the eastward in a steep bluff eighty feet high. **Strong's Point**, its northern extremity, terminates in a round somewhat steep hillock forty feet high, surrounded by marsh; while its northeastern end, which is about four hundred yards to the southeastward of this hillock, is a steep bluff eighty feet high, with its summit covered with grass and a single line of pine trees.

On the western side of Strong's Neck makes in a large but very shallow cove about five-eighths of a mile in diameter and called **Conscience Bay**. The entrance to it is through a very narrow passage leading between Setauket Beach on the northeast and Strong's Neck on the southwest, and then by a still narrower passage between Strong's Neck on the east and Old Fields on the west. The passage between Setauket Beach and Strong's Neck is about two hundred yards wide, with a depth of from two to four feet at mean low water in a very narrow and extremely crooked channel; while the passage between Strong's Point and Old Fields is only about seventy-five yards wide and diminishes to about fifty a quarter of a mile to the southward. The latter passage runs in a southwesterly direction (about **SW. $\frac{1}{2}$ S.**) for half a mile, when it opens out into the broad bay above mentioned, called Conscience Bay. It is dry in many places at low water and in no place has more than six feet, while the bay itself is entirely bare at low spring tides.

A very narrow and shallow stream runs to the southward from the southern end of this bay to the village of Setauket, about half a mile above.

The western shores of Conscience Bay are formed as above mentioned by **Old Fields** and **Crane Neck**,—the former presenting an almost unbroken line of level, cultivated fields, dotted here and there with houses and orchards; while the latter is a thickly wooded country except close to the shore-line on its eastern side, where a narrow belt of cultivated and settled land is seen.

Crane Neck separates Conscience Bay from Smithtown Bay on the west.

DANGERS

IN APPROACHING PORT JEFFERSON HARBOR.

The only danger met with in approaching this harbor from the eastward is **Mount Misery Shoal**, with six feet at low water. It lies off Mount Misery Point at a distance of three-quarters of a mile, is six hundred and fifty yards long **E. N. E.** and **W. S. W.**, and its eastern end is marked by a black spar-buoy (No. 11) placed in fourteen feet,—Old Field Point Light-house bearing **W. $\frac{3}{4}$ N.** Nearly, and Middle Ground Light-house **N. $\frac{1}{4}$ W.** There is a passage with thirteen feet between this shoal and Mount Misery Point.

When past Mount Misery Shoal a spar-buoy, painted white and black in perpendicular stripes, will be seen, bearing about **SW.** and three-quarters of a mile off. This is known as the "Off-shore Buoy," and vessels run for it in order to get the range for passing between the jetties. It is placed in three fathoms at lowest tides, and bears from the black buoy on Mount Misery Shoal **SW.** by **W. $\frac{1}{4}$ W.**, distant a little over a mile, and from Old Field Point Light-house **E.** by **S. $\frac{3}{4}$ S.**, distant seven-eighths of a mile. When up with this buoy the passage between the two jetties is plainly visible and vessels must steer midway between them to enter the harbor.

SAILING DIRECTIONS

FOR APPROACHING PORT JEFFERSON HARBOR.

I. **From the Eastward.**—Bring Middle Ground Light-house to bear **SW.** by **W. $\frac{3}{4}$ W.** and Old Field Point Light-house **SW. $\frac{1}{2}$ S.** and steer for the latter, carrying not less than fourteen fathoms, until within two miles and three-quarters of it, with Middle Ground Light-house bearing **N. $\frac{1}{4}$ W.** and the summit of Mount Misery **S. $\frac{1}{2}$ E.** Here the depth will be twenty-four fathoms and **SSW.** will lead safely, with not less than four fathoms, to the perpendicularly-striped buoy off the entrance. Here vessels must anchor and take a pilot.

The above course avoids Mount Misery Shoal, passing five-eighths of a mile to the westward of it.

II. **From the Westward.**—Bring Old Field Point Light-house to bear **SE.** by **S. $\frac{1}{4}$ S.**, distant one mile and a half, and Middle Ground Light-house **NE.** by **N.**, distant four miles and an eighth, and steer **SE.**, which will bring you up with the perpendicularly-striped buoy off the entrance, where you must take a pilot.

SMITHTOWN BAY.

During easterly gales good anchorage is found under Crane Neck Point in from three to five fathoms. As before mentioned, (see page 364,) this bay is formed by that great curve in the northern shore of Long Island which extends from Crane Neck to The Broken Land, and into which flow the waters of **Stony Brook**, **Nissequague River** and **Sunken Meadow Creek**. It is unobstructed, has from five to eight fathoms in it at low water, and, as above mentioned, affords excellent shelter during easterly and northeasterly gales. **Crane Neck Point**, its eastern point of entrance, is also the northwestern extremity of Crane Neck, and will appear as a high, bluff, sandy head, with steep precipitous faces ranging in height from sixty to one hundred and twenty feet. It is mostly wooded, and its northwestern slopes are terraced and show a series of yellow sandy faces with dark-looking bushes clinging to them. The beach at the base of the head is strewn with boulders, and the point itself is shoal in its approaches and should receive a berth of not less than half a mile.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING SMITHTOWN BAY.

No directions are necessary for making an anchorage under Crane Neck other than, *if coming from the eastward*, to give the point a berth to the southward of half a mile, round it to the westward,—being careful not to approach it nearer than half a mile,—and anchor under Crane Neck in from three and a half to eight fathoms.

In coming from the westward bring Crane Neck Point to bear **SE.**, distant two miles and three-eighths, and Old Field Point Light-house **E.** by **S.** $\frac{3}{8}$ **S.**, distant three miles and three-quarters, and steer **SE.** by **S.**, anchoring at discretion.

SOUTHPORT HARBOR.

This anchorage lies on the northern side of Long Island Sound, about three miles to the westward of Penfield's Reef Light-house. It is at the mouth of Mill River, is very seldom used and is fit only for vessels of small draught. The entrance to it is between Kensie's Point on the east and Farms' Point on the west, a distance of one mile and five-eighths. The harbor is very shoal; but it is intended to improve it by dredging so as to obtain a depth of four feet at low water. Strangers cannot enter it and it is seldom used as an anchorage,—the superior shelter offered by Black Rock and Bridgeport inducing navigators to pass it by.

Kensie's Point, the eastern point of entrance, shows an almost perpendicular face about ten feet high to the southward, and thence grassy land, for the most part under cultivation, rises with a very gentle slope to a height of about seventy feet above the sea.

Farms' Point, or **Frost's Point**, the western point of entrance, is low, nearly level, cultivated and settled. The beach in front of it is covered with boulders to a distance of a quarter of a mile from shore and should not be approached from the southward nearer than three-eighths of a mile.

The eastern shore of the harbor from **Kensie's Point** to the mouth of Mill River is formed by a sand beach backed by marsh. At its northwestern extremity and the eastern point of entrance to the river begins a stone breakwater, which extends in a southwesterly direction for about three hundred and fifty yards. On its off-shore end is built a granite beacon surmounted by an iron shaft and ball; and about a quarter of a mile to the southward of this is a similar beacon, marking the eastern limits of the entrance and generally known as **Southport Beacon**.

Mill River is a very narrow stream, of little importance,—on the western bank of which, close to its mouth, is built the village of **Southport**.

The western shore of the harbor is composed almost entirely of level cultivated lands, but is very irregular in outline,—being much cut up by coves and other indentations. A shallow stream, called **Sasco Creek**, flows into the harbor about five-eighths of a mile to the westward of Mill River; and has for its western point of entrance a level, cleared and cultivated point of land known as **Jennings' Point**. It is faced by a sand beach, off which there are innumerable boulders; and it should not be approached from the southward nearer than a quarter of a mile. From **Jennings' Point** to **Farms' Point** the distance is about five-eighths of a mile.

DANGERS

IN APPROACHING SOUTHPORT HARBOR.

I. *From the Eastward*.—The only danger met with in approaching this harbor from the eastward is **Pine Creek Point Shoal**, which extends to the southward from **Pine Creek Point** for about half a mile and is dry at low water. There are many rocks on this shoal which are bare at half tide, and a red spar-buoy has been placed off its southern end for the convenience of vessels bound either to **Black Rock** or **Southport**.

Kensie's Point should receive a berth to the northeastward of not less than a quarter of a mile to avoid the flats which make off from it to the southwestward; and **Jennings' Point**, on the western side of the harbor, should not be approached nearer than a quarter of a mile.

SAILING DIRECTIONS

FOR APPROACHING SOUTHPORT HARBOR.

I. *From the Eastward*.—With **Penfield's Reef Light-house** bearing **NE.** by **N.** $\frac{3}{8}$ **N.**, distant two miles and three-eighths, **Bridgeport Harbor Light-house** **NE.** $\frac{1}{2}$ **N.**, five miles and three-eighths, and **Stratford Point Light-house** **NE.** by **E.** $\frac{3}{4}$ **E.**, distant seven miles and a half, you will have ten fathoms, with **Great Captain's Island Light-house** bearing **W.** $\frac{3}{8}$ **S.**, distant eight miles and a quarter. Now steer **NW.** by **N.**, which will lead up to the entrance, where you must anchor, about three hundred yards to the southward of **Southport Beacon**, in ten feet at low water. Wishing to go farther up you must take a pilot.

The above course passes half a mile to the westward of **Pine Creek Point Shoal** and a quarter of a mile to the westward of the shoals off **Kensie's Point**.

DANGERS

IN APPROACHING SOUTHPORT HARBOR.

II. *From the Westward*.—The only danger met with in approaching the harbor from this direction is Cockenoe's Island Shoal, which extends to the southeastward from Cockenoe's Island for about one mile and a quarter. It is bare in some places, awash in others, and has scattered over its surface many rocks which are always out. A mile and an eighth E. by *Cockenoe's Island Shoal* S. $\frac{1}{2}$ S. from the northeastern end of the island is a rock awash, known as *George's Rock*; and about six hundred and fifty yards to the southward of this will be seen a red can-buoy. This buoy is of the second class, marked No. 20, and placed in three fathoms near a *nine feet spot* at the southeastern extremity of the shoal. It bears from Penfield's Reef Light-house W. by S. $\frac{1}{2}$ S., five miles and three-eighths; from Middle Ground Light-house W. by N. $\frac{1}{4}$ N., ten miles and a quarter; and from Old Field Point Light-house NW. $\frac{1}{2}$ W., eleven miles and an eighth distant. From this buoy Southport Beacon bears NE., distant three miles and an eighth.

In standing to the northward towards Farms' Point give it a berth of not less than nine hundred yards to avoid the dangerous rocks which make off from it to the southward for five hundred yards.

SAILING DIRECTIONS

FOR APPROACHING SOUTHPORT HARBOR.

II. *From the Westward*.—On the E. by N. $\frac{1}{8}$ N. course through the Sound, bring Norwalk Light-house to bear NW. by W. $\frac{1}{4}$ W., distant three miles, and Eaton's Neck Light-house SW. by S. $\frac{1}{2}$ S., distant four miles and three-quarters, where you will have between eleven and twelve fathoms and NE. $\frac{1}{2}$ N. will lead directly for Southport Beacon. Anchor, when within three hundred yards of the beacon, in ten feet water, and if bound farther up take a pilot.

The above course passes six hundred yards to the eastward of the red can-buoy on Cockenoe's Island Shoal; half a mile to the eastward of the rocks off Farms' Point; and six hundred yards to the eastward of the rocks off Jennings' Point.

WESTPORT HARBOR.

This harbor lies near the mouth of the Saugatuck River, a little over two miles to the westward of Farms' Point, and about six miles to the westward of Penfield's Reef Light-house. The entrance is between Cedar Point on the east and Seymour's Point on the west and is five-eighths of a mile wide, but has only a very narrow channel with six feet at low water over the bar. It is not available for strangers, as the dangers are not buoyed, and the more convenient anchorage under Cockenoe's Island is generally resorted to. Saugatuck River is but a narrow arm of the Sound and heads at the village of Westport, about two miles and a half above its mouth. Its channel is very winding, obstructed by mud flats, and very dangerous to navigate, even by the smallest vessels, without a pilot.

Cedar Point, the eastern point of entrance, is a long narrow sand point faced by a great mass of rocks. It is backed by marsh, and this again by level cultivated land thickly dotted with houses.

Seymour's Point, the western point of entrance, is composed entirely of marsh faced by a narrow strip of sand. It is very shoal,—dry flats extending to the eastward from it for a quarter of a mile.

The eastern bank of the river above Cedar Point has a general course about NW. by W. for nearly a mile and is composed of low, level, grassy land, faced by marsh and backed by a somewhat hilly and undulating country. It then turns abruptly to the northward, running about NNE. for two miles to the village of Westport. The banks are somewhat higher, showing low, steep faces, with occasional small groves of trees and many houses. The river is crossed by the New York and New Haven Railroad about a mile above Seymour's Point. Here it is only about one hundred and fifty yards wide.

The western bank above Seymour's Point is somewhat higher than the eastern and more hilly in outline. The shore shows low, steep faces, and the summits are for the most part grass land with a few trees here and there, and thickly dotted with houses.

The village of Westport occupies both banks of the river at its head, but is of little commercial importance.

DANGERS

IN APPROACHING WESTPORT HARBOR.

In approaching Westport Harbor from the eastward the only danger met with, to which such vessels as could enter the river would pay any attention, is Cockenoe's Island Shoal, above described as a long shoal making off to the southeastward from the island of that name. It is bare in some places, awash in others, and has scattered over its surface many rocks which are always out; but the most dangerous part of the shoal to vessels bound into the Saugatuck is *George's Rock*, which is awash at low water and lies one mile and an eighth E. by S. $\frac{1}{2}$ S. from the northeastern end of Cockenoe's Island. A red can-buoy of the second

class, marked No. 20, is placed about six hundred yards to the southward of this rock, marking the southeastern extremity of the shoal. Penfield's Reef Light-house bearing **E. $\frac{5}{8}$ N.** clears Cockenoe's Island Shoal and leads half a mile to the northward of George's Rock.

When past George's Rock and approaching the bar a bare rock will be seen, on the western side of the entrance, about a quarter of a mile to the eastward of Seymour's Point. This is called **Seymour's Rock**, and the flats extend to the eastward from it for three hundred and fifty yards with from three to five feet at mean low water.

The channel across the bar is exactly midway between this rock and Cedar Point,—its centre being four hundred and fifty yards distant from both; but strangers cannot cross the bar without a pilot.

SAILING DIRECTIONS

FOR APPROACHING WESTPORT HARBOR.

I. Coming from the Eastward.—Bring Penfield's Reef Light-house to bear **NE.** by **N. $\frac{3}{8}$ N.**, distant two miles and three-eighths, Bridgeport Harbor Light-house **NE.** by **N. $\frac{1}{2}$ N.**, a little over five miles and a quarter, and Black Rock Light-house **NE.** by **N. $\frac{7}{8}$ N.**, distant three miles and seven-eighths, where you will have ten fathoms, with Eaton's Neck Light-house bearing **SW. $\frac{5}{8}$ W.** and Norwalk Light-house **W. $\frac{3}{8}$ S.**,—the latter being distant eight miles and a quarter. Now steer **W.** by **N. $\frac{3}{4}$ N.**, which will lead up to the bar, where you must anchor in from twelve to fifteen feet as soon as you come in line between Cedar Point and the northeastern extremity of Cockenoe's Island. If bound into the river take a pilot.

The above course passes five-eighths of a mile to the northward of George's Rock and about six hundred yards to the northward of the northeastern extremity of Cockenoe's Island Shoal.

II. Coming from the Westward.—On the **E.** by **N. $\frac{7}{8}$ N.** course through Long Island Sound, when Norwalk Light-house bears **NW.** by **W. $\frac{1}{4}$ W.**, distant three miles, and Eaton's Neck Light-house **SW.** by **S. $\frac{1}{2}$ S.**, distant four miles and three-quarters, steer **NE.** by **N. $\frac{1}{2}$ N.** towards Southport Entrance until you come abreast of the red buoy on the southeastern end of Cockenoe's Island Shoal bearing **NW. $\frac{1}{2}$ W.**, six hundred yards distant. Now steer **N.** by **E. $\frac{1}{2}$ E.** for three-quarters of a mile until the northeastern extremity of Cockenoe's Island bears **W.** and Penfield's Reef Light-house **E.** by **N.**, when **NW.** by **W. $\frac{3}{4}$ W.** will lead up to the bar.

The above courses pass between five and six hundred yards to the eastward of the red buoy on the southeastern end of Cockenoe's Island Shoal; three-eighths of a mile to the eastward, and half a mile to the northward, of George's Rock; and four hundred yards to the northward of the northeastern end of Cockenoe's Island Shoal.

COCKENOE'S ISLAND HARBOR

is the name given to the anchorage contained between Cockenoe's Island on the east and Goose Island on the west,—these two being the easternmost of the Norwalk Islands. The passage between them is three-quarters of a mile wide, but much obstructed by sunken rocks and shoals, which diminish the width of the available channel between the lines of six feet at low water to about five hundred yards.

Cockenoe's Island, which lies on the eastern side of the anchorage, is crescent-shaped, with the horns to the northward, and has a diameter of half a mile. Only its eastern portion is composed of good land,—the rest of the island being a mere narrow strip of sand and marsh. The eastern half has a perfectly level surface, entirely under cultivation, with a single house upon it, and shows yellow sand bluffs with steep faces, separating the lower cultivated lands, and fringed at their base with a narrow sand beach strewn with boulders. A somewhat remarkable bluff stands upon this eastern shore about midway between the northeastern and southern ends of the island; and, being the highest land on it, is used as a landmark by vessels coming in. There is no passage between the island and Seymour's Point.

**Cockenoe's
Island.**

Goose Island, on the western side of the harbor, lies about three-quarters of a mile **SW.** by **W.** from Cockenoe's Island, and is a mere narrow low sand spit, about three hundred yards long **N.** by **E.** and **S.** by **W.**, covered with grass, and has a single house upon it. It is surrounded by flats, and at low water its boundaries are extended by the bare sands to a length of eight hundred yards; and, at extreme low springs, it is connected with Chimon's Island, three-quarters of a mile to the westward of it.

Goose Island.

Hay Island, three-eighths of a mile to the westward of Goose Island, and the **Calf Pasture Islands**, three-quarters of a mile to the northwestward of it, have been already described on page 363, and do not properly belong to a description of this harbor; but there is still another islet, lying about three hundred and fifty yards from the mainland, about midway between Seymour's Point and Calf Pasture Point. It is called Sprite Island, and serves as a landmark in coming in to the anchorage from the eastward.

Hay Island.

Sprite Island is about three hundred yards long **E NE.** and **W SW.**, nearly level, entirely bare of trees, and shows steep faces to the southward fringed with boulders. The middle of the island is the highest, where there is a sort of hillock with perpendicular faces,—the land sloping gently both to the eastward and westward. At low water this island is connected with the mainland by mud flats, and must not be approached from the southward nearer than eight hundred yards by vessels drawing six feet.

DANGERS

IN APPROACHING AND ENTERING COCKENOE'S ISLAND HARBOR.

In approaching this harbor vessels must not come too near Cockenoe's Island on account of the *dangerous shoal which makes off from it to the southward*, forming the western arm of Cockenoe's Island Shoal. This arm extends in a **SE. $\frac{3}{4}$ S.** direction from the prominent hillock on the eastern shore, previously mentioned, for three-quarters of a mile, and has upon it many dangerous rocks. Ten feet at low water is found on its southeastern extremity three-quarters of a mile from the island and the same distance **W. by S. $\frac{1}{4}$ S.** from the red buoy on the southeastern end of the shoal; and six hundred yards to the northward of this is a rock awash, called *Dunder Rock*, which bears from the hillock on the eastern side of the island **SE. $\frac{1}{2}$ S.**, distant half a mile, and from the middle of Goose Island **E. $\frac{1}{2}$ N.**, distant one mile and an eighth.

Between eight and nine hundred yards to the northwestward of Dunder Rock and close in with the southern shore of Cockenoe's Island lie two rocks, always out, known as **Haycock Rocks**; and four hundred yards to the southwestward of these and the same distance from the south shore **Channel Rock**. of the island lies Channel Rock, awash at low water. This rock bears from Dunder Rock **W. by N. $\frac{3}{8}$ N.**, a little over half a mile; from the northwestern extremity of Cockenoe's Island **S. by E. $\frac{1}{2}$ E.**; and from the middle of Goose Island **NE. by E. Easterly**, distant five-eighths of a mile. It is on the eastern side of the channel and is not buoyed. Vessels to avoid it must not go the eastward of the middle and highest part of Sprite Island bearing **NW. $\frac{1}{4}$ N.**

On approaching the entrance there will be seen to the westward of the course, bearing about **NW. by W.** and half a mile off, a black spar-buoy. This is on Peck's Ledge, with three feet at low water, which lies near the northeastern end of the shoals making off from Goose Island. It is six hundred yards from the northern end of the island, and the buoy is placed in eight feet about **Peck's Ledge**. one hundred yards to the northeastward of the shoal of the rock,—Sprite Island bearing **NW. by N.**, distant seven-eighths of a mile; the northwestern end of Cockenoe's Island **N. by E. $\frac{3}{8}$ E.**, about eleven hundred yards; and the northern end of Goose Island **SW. by S. $\frac{1}{4}$ S.**, distant three-eighths of a mile. There is no safe passage to the southward of this ledge, as the *flats off Goose Island* come within one hundred yards of it with four feet at mean low water, and a group of sunken rocks, known as *The Harrow Teeth*, lie about two hundred yards to the southwestward of it and four hundred yards to the northward of Goose Island.

When past Channel Rock the western shore of Cockenoe's Island should not be approached nearer than three hundred yards on account of the *flats making off from it*. The best water is about two hundred yards to the eastward of Peck's Ledge buoy.

In making the anchorage vessels should not approach the Calf Pasture Islands nearer than a quarter of a mile or Sprite Island nearer than three-eighths of a mile on account of the *flats which surround them*.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING COCKENOE'S ISLAND HARBOR.

I. From the Eastward.—On the course **W. by S. $\frac{1}{4}$ S.** through the Sound, when Norwalk Light-house bears **W. by N.**, distant four miles and a half, and Eaton's Neck Light-house **SW. $\frac{1}{2}$ S.**, distant six miles and three-eighths, the hillock on the eastern side of Cockenoe's Island will bear **NW. by N. $\frac{3}{8}$ N.** and **NW. $\frac{1}{2}$ N.** will lead directly into the harbor, heading exactly for the middle and highest part of Sprite Island. Anchor on this course, in from eight to ten feet, as soon as the hillock on Cockenoe's Island bears **E. by S. $\frac{1}{4}$ S.**

The above course passes nearly half a mile to the westward of the southwestern end of Cockenoe's Island Shoal; the same distance to the westward of Dunder Rock; three hundred and fifty yards to the westward of Channel Rock; and about one hundred and seventy-five yards to the eastward of the black buoy on Peck's Ledge. It carries not less than fourteen feet at low water until past that buoy; after which the water shoals gradually and the lead will be the best guide to the anchorage.

II. From the Westward.—A vessel from the westward wishing to make this anchorage should, when to the eastward of the line between Norwalk and Eaton's Neck light-houses, on the **E. by N. $\frac{1}{4}$ N.** course through the Sound, bring the former to bear **NW. by N. $\frac{1}{4}$ N.** and the latter **S. by W. $\frac{1}{4}$ W.**, when the prominent hillock on the eastern end of Cockenoe's Island will bear **NE. by N. $\frac{1}{2}$ N.** and

that course if steered will lead, with not less than sixteen feet, up to the entrance. On this course, when the southern extremity of Goose Island is nearly abeam, bearing about NW. $\frac{3}{4}$ W., distant nine hundred yards, you will have sixteen feet, and N. $\frac{1}{2}$ W. will lead safely up to the buoy on Peck's Ledge, carrying not less than thirteen feet. When up with the buoy pass to the eastward of it, (giving it a berth to the westward of about two hundred yards,) and steer NW. $\frac{1}{2}$ N. towards the middle of Sprite Island, anchoring at discretion.

The above courses pass three hundred and fifty yards to the eastward of the southern end of Goose Island Shoals; a quarter of a mile to the eastward of Goose Island; the same distance to the westward of Channel Rock; three hundred yards to the eastward of The Harrow Teeth; and two hundred yards to the eastward of Peck's Ledge buoy.

SHEFFIELD ISLAND HARBOR AND NORWALK RIVER.

Norwalk River cannot be entered by strangers,—the approach to it being through a very narrow and crooked channel full of rocks and shoals, very few of which are buoyed. There is, however, a good and safe anchorage between Sheffield Island and the main, which is frequently resorted to by coasters,—being easy of access and well sheltered from all winds except those from the west. The entrance to it is between Norroaton Point on the north and Sheffield Island on the south, and is five-eighths of a mile wide with a depth of from ten to fourteen feet at low water; but there are many dangerous shoals in the approaches, which will be described in place.

Norroaton Point is low, rocky, and covered with a thick growth of scrub. The land back of it is composed of a great number of high, steep, wooded hills, with very irregular outline; but in its immediate vicinity it is mostly low and marshy. It is shoal in its approaches,—there being a seven feet rock three-eighths of a mile to the southwestward of it. **Norroaton Point.**

Sheffield Island, on the south side of the entrance, is the westernmost as well as the largest of the Norwalk Islands. It is of very irregular shape, about a mile long E. by N. and W. by S., low, level, and for the most part sandy, with a thick growth of bushy trees about midway of its length,—in the middle of which will appear a large white house with flag-staff in front of it. Its eastern end is almost entirely marshy, while the middle of the island is occupied by cultivated fields; and its western end terminates in a long, narrow, curved sand spit, locally known as **The West Hook**. The beach surrounding the island is strewn with boulders, especially on the southern side, where the land descends precipitously. **Sheffield Island.**

About a quarter of a mile from the end of West Hook and close to the grove of trees above mentioned will be seen a two-story grey stone house surmounted by a low tower and lantern; and a little to the northeastward of this a smaller house painted white. The tower is Norwalk Light-house, on the keeper's dwelling, and shows a fixed white light, of the fourth order, varied at intervals of one minute by red flashes, and visible twelve and a half miles. The dwelling stands upon a low point about six feet above high water, and the light is fifty-two feet above the mean level of the Sound. Its geographical position is **Norwalk Light-house.**

Latitude 41° 2' 53" N.
 Longitude 73° 25' 11" W.,

and it bears from

	Miles.
Penfield's Reef Light-house, W. by S. $\frac{1}{4}$ S.	nearly 10
Stratford Point Light-house, W. by S. $\frac{1}{4}$ S.	about 15 $\frac{1}{2}$
Middle Ground Light-house, W. $\frac{1}{4}$ N.	14 $\frac{1}{2}$
Old Field Point Light-house, NW. by W. $\frac{1}{4}$ W.	14 $\frac{1}{2}$
Eaton's Neck Light-house, N. $\frac{1}{4}$ W.	5 $\frac{1}{2}$
Great Captain's Island Light-house, E. by N. $\frac{3}{4}$ N.	a little over 10
Execution Rocks Light-house, NE. by E. $\frac{1}{4}$ E.	a little over 18

There is no fog-signal.

The northern shore of Sheffield Island Harbor from Norroaton Point to Beacon Point (at the entrance to Norwalk River) is much cut up by coves and other indentations and presents a very irregular surface outline,—being in places rugged and bare, in others hilly and wooded, and in others flat and marshy. There are many outlying rocks, scarcely any of which are buoyed; and the numerous islands are themselves surrounded by shoals, rendering the approach to the river extremely dangerous for strangers.

The first of these islands met with to the eastward of Norroaton Point is Tavern Island, a small islet about two hundred yards long, with a rocky hillock at its western end on which is a tall flag-staff. Its surface is dotted with low trees, and there is a large lone tree at its eastern end and a house near the centre of the island. It lies about five-eighths of a mile to the eastward of Norroaton Point; seven hundred yards to the southward of Wilson's Point, (the first point on the north shore to the eastward of Norroaton Point;) and nearly half a mile to the northward of the north point of Sheffield Island,—the usual anchorage being on a line between that point and Tavern Island. There is no passage between the island and Wilson's Point,—the area between the two being occupied by flats and ledges, many of them **Tavern Island.**

bare at low water. Two small islets about fifty yards in diameter lie to the northward of the island, two hundred yards from its northern end,—one bearing about NE. by N. and the other nearly due N. At low water they are connected with the island by a narrow sand spit of a crescent shape strewn with boulders.

On the northern shore, between Norroaton Point and Wilson's Point, makes in **Wilson's Creek**, which is nearly a quarter of a mile wide at its mouth, but is bare at low water and of no importance. Wilson's Point, its eastern point of entrance, is a smooth gently sloping point, covered only with grass, and with a single house on its summit, about a quarter of a mile inland. There is a grove of trees a little to the eastward of the point. On its eastern side, between it and Beacon Point, makes in another shallow creek, also bare at low water, and sometimes known as **Cedar Creek**. Its shores are for the most part composed of marsh, with occasional wooded hammocks, and the flats extend from its mouth three-eighths of a mile to the southward with from two to four feet at low water.

In the mouth of Cedar Creek lie several small islets which merit only a passing mention. Of these, the first to the eastward of Wilson's Point is called **Webb's Hammock**, and lies in the southern edge of the marsh, about four hundred yards to the eastward of that point, with which it is connected at low water. It is about seventy-five yards long E. by S. and W. by N., is but little elevated above the surrounding marsh, and has a few trees upon it. A little over four hundred yards to the eastward of it, and about a quarter of a mile to the northward of Tavern Island, is **Tavern Island Hammock**, which is covered at high water. It is a mere mass of stone, about six hundred yards long N. and S., and lies close in with the marsh. About an eighth of a mile to the eastward of Tavern Island Hammock is **Fort Molly**, an islet about forty yards long and very narrow and lying about N NE. and S SW. From the easternmost of the islets north of Tavern Island it bears about N. by E., four hundred yards distant, and it is about one hundred yards to the eastward of the marshy point at the entrance to the creek. A little over three hundred yards to the northeastward of Fort Molly, and almost exactly in the middle of the entrance to the creek, is **Cedar Hammock**, a round rocky islet, about fifty yards in diameter, with grassy summit, and surrounded by bare ledges and mud flats.

Beacon Point lies nearly half a mile to the eastward of Cedar Hammock and is the southern extremity of a neck of marshy land forming the western bank of the Norwalk River. At its southern end this peninsula terminates in a sort of island of firm grassy land, with somewhat steep faces and nearly level surface, forming the true western point of entrance to Norwalk River; although the name has been given to it from the beacon built in the marsh about a quarter of a mile to the eastward of it. The land in the background appears as a mass of steep, rugged, wooded hills, with the steeples and white houses in the village of Norwalk scattered along their eastern and southern slopes. In the summer the village appears in the midst of a thick growth of trees. The beacon at the entrance to Norwalk River is a granite structure surmounted by a spindle and cage, and is built in the marsh close to the water's edge. It is generally known as **Norwalk Beacon**.

About a quarter of a mile S. by E. from the middle of the southern end of Beacon Point lies a rocky ledge, part of which is always out, and known as **White Rock**. It is about one hundred yards long at low water in a N. by E. and S. by W. direction and is surrounded by shoal water. Three hundred and fifty yards to the southward of it lies **Tree Hammock**, about fifty yards in diameter, and surrounded by flats strewn with boulders; and an eighth of a mile to the westward of this, and four hundred and fifty yards to the southward of White Rock, is **Sandy Hammock**, which is only about twenty-five yards in diameter. A dangerous reef, strewn with boulders, makes to the northward from Sandy Hammock for an eighth of a mile,—the channel passing between its northern end and White Rock.

Between Tree Hammock and the eastern end of Ram Island, about two hundred and fifty yards from each, lies **Ram Island Hammock**, a mere mass of stones, about seventy-five yards long N. and S. and covered at high water. This line of islets, beginning with White Rock and ending with Ram Island Hammock, forms the eastern boundary of Sheffield Island Harbor and strangers must not attempt to pass to the eastward of them.

Next to the eastward of Sheffield Island, with which it is connected at low water by a mud flat mixed with stones, lies **Ram Island**. It is nearly eight hundred yards long E. and W. with an average width of about two hundred and fifty yards, and is composed of level cultivated lands dotted at nearly regular intervals with tall lone trees. Near its western end stands a clump of thick low scrub, above which project the tops of a few taller trees; and another clump of bushy trees stands near its southeastern end. On the northwestern side the fast land is fringed with marsh, sand and mud flats,—the last mentioned being strewn with stones and boulders.

Between Ram and Sheffield islands, and off the mouth of the large shallow cove formed by these islands, with their connecting mud flat, lie a number of ledges,—one of which is always out and the others are bare at half tide. They are four in number, and the general name **Dog Islands** has been given to them.

About an eighth of a mile to the southeastward of Norwalk Beacon and on the western side of the entrance to Norwalk River lies **Long Beach Island**, about two hundred and fifty yards in diameter and composed entirely of marsh. At low water a bare sand spit, covered with pebbles, extends to the southeastward two hundred and fifty yards and then to the eastward three hundred and fifty yards. The channel into Norwalk River passes between this sand spit and Round Beach Island, a little over a quarter of a mile to the eastward. Long Beach Island is one-third of a mile to the northeastward of White Rock, five-eighths of a mile to the northward of Ram Island, and about the same distance to the southwestward of Calf Pasture Point,—the eastern point of entrance to the river.

When passing to the southward of Long Beach Island you also pass to the northward of a nearly level sandy islet called Chimon's Island. It shows steep yellow faces to the northward and has a single house standing in cultivated grounds about midway between its eastern and western ends. The island is highest near the middle, slightly undulating, and has no trees except one large bushy tree near the house. A sand beach, thickly strewn with boulders, surrounds it, and at low water extends to the southward to within fifty yards of Copps' Island. There is good anchorage in from three to five fathoms in the pocket between this island and Ram Island, but it is not often used, as it cannot be reached from the Sound by vessels drawing over four feet except at high water. **Chimon's Island.**

Betts' Island, next to the northeastward of Chimon's Island, is in reality two islands, extending to within one hundred and fifty yards of the northern side of Chimon's. The westernmost is about one hundred yards in diameter, formed of bare sand, and joined at half tide by a strip of shingle, about three hundred yards long, to the eastern and largest island, which is about one hundred and fifty yards long E. and W. and composed of sand covered with grass, with steep faces descending to a beach fringed with boulders. The low, nearly level and grassy island seen to the eastward of this is Hay Island. **Betts' Island.**

Standing to the northward into the river you will pass between Long Beach Island and a small bare islet, composed of pebbles and rocks, which lies about three-eighths of a mile to the eastward of Long Beach and about two hundred yards to the southward of Calf Pasture Point. This is Round Beach Island. The fast land on it is only about sixty yards long in a N. and S. direction,—the rest of the island being composed of marsh, for the most part covered at high water.

Calf Pasture Point, the eastern point of entrance to Norwalk River, is composed entirely of marsh land fringed with mud and sand, and is very shoal in its approaches,—there being no passage between it and Round Beach Island, nor between it and the Calf Pasture Islands to the eastward. Back of the point the land is comparatively low, slightly undulating, cleared, cultivated and settled, and rises gradually to the hilly country back of the village of Norwalk.

Norwalk River is five-eighths of a mile wide between Calf Pasture and Beacon points, but gradually diminishes in width until abreast of the village, where it is only about one hundred yards wide. Six feet at low water may be taken up to the stone bridge at the village through a channel not less than sixty feet wide, and it is proposed by the U. S. Engineers to increase this width to one hundred feet. This improvement will probably be completed before the publication of this work. Both banks of the river are marshy, but backed by level, cultivated and settled lands. Its general course from its mouth to the railroad bridge, nearly a mile and a half above, is N. N. W.; but from the bridge it follows a winding course, with a general direction about N. N. E., to the village.

South Norwalk is situated on the west bank, at the railroad crossing, and was formerly known as Old Wells. It is now a suburb of the village itself. Norwalk occupies both banks, at the head of navigation, a little over two miles and a half above the mouth. It has some manufacturing interest, but is of little commercial importance.

DANGERS

IN APPROACHING AND ENTERING SHEFFIELD ISLAND HARBOR.

Coming from the westward, the first danger met with by vessels bound into this harbor is Long Neck Point Shoal, extending to the southward from Long Neck Point for a quarter of a mile, and is not buoyed. It is bare in places at low water, and to avoid it you should not stand to the northward of Norwalk Light-house bearing E. N. E. until to the eastward of the point.

When past Long Neck Point look out on the eastern side of the passage for Green's Ledge,—the red can-buoy* on which will soon be seen, bearing about E. N. E. and three-quarters of a mile off. This ledge makes off from the western end of Sheffield Island in a W. by S. $\frac{1}{2}$ S. direction for a mile and a half and is bare in places at low water a quarter of a mile from the island. Six feet at low water is found about midway of its length and half a mile from The West Hook, and eight feet but a short distance inside the buoy. The buoy is in sixteen feet water, is of the second class, marked No. 22, and bears from Norwalk Light-house W. by S. $\frac{1}{2}$ S., distant a mile and an eighth; from the red buoy on Smith's Rock E. by N. $\frac{1}{4}$ N., distant two miles and three-eighths; and from Norroaton Point S. W. $\frac{1}{4}$ S., distant one mile. Vessels must not approach this buoy nearer than four hundred and fifty yards. **Green's Ledge.**

On the northern side of the entrance, Fish Island (a marshy islet on the eastern side of the entrance to Long Neck Cove) must not be approached nearer than a quarter of a mile to avoid Fish Island Reef, which makes to the southward for about two hundred and fifty yards and is not buoyed. This reef has many bare and sunken rocks upon it, but is easily avoided by not standing to the northward of the southern end of Norroaton Point bearing E. N. E. **Fish Island Reef.**

When past Green's Ledge buoy and standing into the harbor you must be careful not to go to the southward of the northern point of Sheffield Island bearing E. by N. $\frac{1}{4}$ N. to avoid the northern edge of that shoal, which extends without interruption from the buoy to the island. Also, do not approach Norroaton Point from the southward nearer than three hundred yards in order to avoid Norroaton Point Shoal, which extends to the southward from that point for one hundred and fifty yards with less than six feet at low water. **Norroaton Point Shoal.**

There is also a ledge with from seven to nine feet three-eighths of a mile SW. by W. $\frac{1}{2}$ W. from Norroaton Point and nearly a mile W. by N. $\frac{3}{4}$ N. from Norwalk Light-house, which is dangerous to vessels of large draught. It is not buoyed, but may be avoided when in its vicinity by not going to the northward of the middle of Tavern Island bearing NE. by N.

Tavern Island should receive a berth to the northward of about two hundred yards to avoid the flats off its southwestern side, which have from two to four feet at low water upon them and are marked by a black spar-buoy; and on the southern side of the harbor the Dog Islands should not be approached nearer than an eighth of a mile. Vessels seeking anchorage in Sheffield Island Harbor must not go to the eastward of the line between Cedar Hammock and the eastern end of Sheffield Island; and it is safest not to proceed even so far,—the usual anchorage being on a line between the middle of Tavern Island and the northern point of Sheffield Island. Those bound to Norwalk must take a pilot.

Only one of the shoals off the entrance to Norwalk River is buoyed, viz: White Rock, which has a red spar-buoy (No. 2) placed in six feet water close to the ledge. Vessels using the

White Rock. western channel, which passes between Long Beach Island and Beacon Point, pass to the northward of this buoy; while those who pass between White Rock and Tree Hammock go well to the southward of it notwithstanding its color.

It must also be remarked that on the southern side of Green's Ledge, about four hundred yards due S. from The West Hook of Sheffield Island, there is a tall wooden spindle, surmounted by a cage, built upon a reef of rocks extending to the southward from the main body of the ledge. This is **Great Reef Spindle**, and is of use mainly as a guide to vessels passing through Long Island Sound. There is another reef of bare rocks about two hundred and fifty yards to the westward of the spindle, but this latter always shows itself.

Great Reef Spindle bears from

Norwalk Light-house, SW. by S. $\frac{1}{4}$ S.-----	700 yards.
The buoy on Green's Ledge, E. $\frac{1}{2}$ N.-----	1 $\frac{1}{2}$ miles.
Smith's Rock buoy, E. by N.-----	3 $\frac{1}{4}$ "
The buoy on The Cows, E. by N. $\frac{1}{2}$ N.-----	5 "

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING SHEFFIELD ISLAND HARBOR.

A vessel which has come through the Main Channel of Long Island Sound, when, on the E. by N. $\frac{7}{8}$ N. course, Great Captain's Island Light-house is nearly abeam bearing N. by W. $\frac{2}{3}$ W., and Eaton's Neck Light-house is in range with Lloyd's Point—the latter bearing E. four miles and three-quarters distant—may steer NE. $\frac{3}{4}$ E., which course will lead to the entrance to the harbor with not less than three and three-quarter fathoms. On this course, when Norwalk Light-house bears E. $\frac{3}{4}$ N., distant a mile and three-eighths, and the southern extremity of Norroaton Point is directly ahead bearing NE. $\frac{3}{4}$ E., distant one mile, you will have four and a half fathoms and ENE. will lead safely to the anchorage. Anchor in from ten to thirteen feet, with the light-house bearing S. by W.

The above courses pass three-quarters of a mile to the southward of the red buoy on The Cows; five-eighths of a mile to the southward of Smith's Rock; three-eighths of a mile to the southward of Long Neck Point Shoal; a quarter of a mile to the northward of the red buoy on Green's Ledge; nine hundred yards to the southward of Fish Island; five-eighths of a mile to the northward of Great Reef Spindle; a quarter of a mile to the southward of Norroaton Point; and four hundred yards to the southward of Tavern Island.

Or, when past Execution Rocks Light-house you may bring it to bear SW. by W. $\frac{3}{4}$ W. and steer NE. by E. $\frac{3}{4}$ E., which will lead directly towards Norwalk Light-house. On this course, when off Shippan Point, with Eaton's Neck Light-house bearing SE., distant five and a half miles, you will have eleven fathoms and must steer NE. $\frac{3}{4}$ E. for Norroaton Point, following the directions given above.

The NE. by E. $\frac{3}{4}$ E. course towards Norwalk Light-house passes five-eighths of a mile to the southward of the red buoy on The Cows.

Coming from the Southern side of the Sound.—Bring Eaton's Neck Light-house to bear SSE. and steer N NW. until Norwalk Light-house bears E. by N. $\frac{1}{4}$ N., nearly two miles distant, when you will have three and three-quarter fathoms, with Green's Ledge buoy nearly abeam. Now steer NE. $\frac{3}{4}$ E. towards Norroaton Point for a little over half a mile, or until Norwalk Light-house bears E. $\frac{3}{4}$ N., when ENE. will lead to the anchorage.

The N NW. course from off Eaton's Point passes half a mile to the westward of the red buoy on Green's Ledge and seven-eighths of a mile to the eastward of Long Neck Point Shoal.

Coming from Huntington Bay.—When in the mouth of the bay, in six fathoms, with Eaton's Neck Light-house bearing **E.**, distant one mile and a quarter, steer **N. $\frac{3}{4}$ W.**, which course will lead, with not less than four fathoms, to the entrance. When in three and three-quarter fathoms, with Long Neck Point bearing **W. $\frac{3}{4}$ N.**, nearly a mile, and Norwalk Light-house **E. by N. $\frac{1}{4}$ N.**, a mile and seven eighths distant, steer **NE. $\frac{3}{4}$ E.** towards Norroaton Point and follow the directions previously given.

Coming from the vicinity of Oyster Bay.—When clear of the bay, bring Eaton's Neck Light-house to bear **E. by S. $\frac{1}{2}$ S.** and Lloyd's Point (middle of the point) **S. $\frac{3}{4}$ E.** and steer **NE. by N. $\frac{1}{2}$ N.**, which course will lead to the entrance. When in three and three-quarter fathoms, with Long Neck Point bearing **W. $\frac{3}{4}$ N.**, nearly a mile, and Norwalk Light-house **E. by N. $\frac{1}{4}$ N.**, a mile and seven-eighths distant, steer **NE. $\frac{3}{4}$ E.** towards Norroaton Point and follow the directions previously given.

LIGHT-HOUSE.

NAME.	Latitude.	Longitude West.		Fixed or Revolving.	Interval of Flash.	Height above sea-level.	Distance visible in nautical miles.
		In arc.	In time.				
	° ' "	° ' "	h. m. s.		m. s.	Feet.	
Norwalk Light-house.....	41 2 53	73 25 11	4 53 41	F. V. R. F.	1 0	52	12 $\frac{1}{2}$

TIDES.

Corrected Establishment at Sheffield Island.....	10 ^h 58 ^m
Mean Rise and Fall of tides.....	7.4 ft.
Mean Rise and Fall of Spring tides.....	8.2 ft.
Mean Rise and Fall of Neap tides.....	6.6 ft.
Mean duration of Rise.....	6 ^h 13 ^m
Mean duration of Fall.....	6 ^h 13 ^m
Mean duration of Stand.....	0 ^h 19 ^m
Rise of highest tide observed.....	9.1 ft.

VARIATION OF THE COMPASS.

The magnetic variation for 1880, off Sheffield Island, is 8° 20' W., with an approximate annual increase of 2 $\frac{1}{4}$ '.

DARIEN RIVER.

Darien River is the next harbor to the westward of Sheffield Island Harbor.—**Scotch Cove**, which lies between Fish Island and Long Neck Point, being unfit for anchorage. The river empties into the Sound between Long Neck on the east and Norroaton Neck on the west,—being half a mile wide at its entrance but nearly bare at low water. It is sometimes called **Good Wives River**.

Long Neck Point, the southern end of Long Neck and the eastern point of entrance to the river, is smooth, gently sloping and grassy, and entirely under cultivation. It is comparatively bold-to and may be approached from the westward within four hundred yards with not less than three fathoms; but on its southern side makes out Long Neck Point Shoal to a distance of three hundred and fifty yards,—rendering it unsafe to approach the point on that side nearer than six hundred yards.

Long Neck, which forms the eastern bank of the river, is composed of nearly level, very gently sloping, cultivated land, fringed with marsh, with a few houses here and there.

Norroaton Neck, which forms the western bank, is almost entirely marsh, dotted at intervals with small clumps of trees. The southern point of the neck terminates in a beach thickly strewn with boulders.

About a mile above its mouth the river is crossed by a bridge, where is a small settlement called **Ring's End**; and above this the stream is known as **Gorman's Pond**,—the bridge being of the nature of a causeway and cutting off all communication. Near Ring's End and thence to **Darien**, about three-eighths of a mile inland, the land is all low, nearly level, cultivated and thickly settled. At low water the stream is a mere thread and at spring tides it is bare. Strangers cannot enter it; and the only anchorage is under Long Neck, where there is shelter for small vessels in easterly winds.

DANGERS

IN APPROACHING AND ENTERING DARIEN RIVER.

I. *From the Eastward.*—In approaching this harbor from the eastward the first danger met with is **Long Neck Point Shoal**, which makes off to the southward from Long Neck Point for about three hundred and fifty yards and has from two to ten feet upon it at low water. It is not buoyed, but is easily avoided by giving the point a berth to the northward of seven hundred yards, or by not going to the northward of **Norwalk Light-house bearing E NE.**

On the western side of the approach look out for Smith's Rock, on the southern extremity of a ledge half a mile long **N.** and **S.** and for the most part bare at low water. A red spar-buoy (No. 24) is placed on its southern end in twelve feet,—Norwalk Light-house bearing **E.** by **N.** $\frac{1}{2}$ **N.**, distant three miles and five-eighths; Long Neck Point **NE.** $\frac{1}{2}$ **E.**, nearly one mile; Shippan Point **W.** $\frac{1}{2}$ **S.**, one mile and a half; and Great Captain's Island Light-house **W.** by **S.** $\frac{3}{4}$ **S.**, six miles and a half distant.

When past Smith's Rock there are no dangers until up with Long Neck Point, to which a berth of three hundred yards should be given; and a red spar-buoy will be seen ahead, bearing about **NNW.** and four hundred yards off. This is on what is called The Middle, a detached shoal, with four feet at low water and from seven to eleven feet on all sides of it, which lies

The Middle. four hundred yards **NW.** by **W.** from Long Neck Point and a quarter of a mile **SE.** from the southern end of Norroaton Neck. The buoy is marked No. 2. On its western side there is a passage one hundred and fifty yards wide, with from ten to eleven feet at low water, between The Middle and a number of bare and sunken rocks known as The Clumps, which form part of the long shoal extending to the southward from Norroaton Neck for four hundred and

The Clumps. fifty yards. The southernmost of The Clumps are two rocky islets lying **E NE.** and **W SW.** from each other, fifty yards apart, and known as The Brothers. One hundred and fifty yards to the northward of the northernmost of The Brothers and two hundred yards from the southern end of Norroaton Neck is a rock with two feet at mean low water; and one hundred and fifty yards **N NE.** from the northernmost of The Brothers and an eighth of a mile to the northward of the red buoy on The Middle is a small bare rock, not named. Above this the river is all flats and at low springs is nearly bare.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING DARIEN RIVER.

I. From the Eastward.—On the **W.** by **S.** $\frac{1}{8}$ **S.** course from between The Middle Ground and Stratford Point, when Norwalk Light-house bears **N.** $\frac{1}{4}$ **W.**, distant two miles and three-eighths, and Eaton's Neck Light-house **S.** $\frac{1}{4}$ **E.**, distant three miles and three-eighths, Long Neck Point will bear **NW.** by **W.** and **NW.** by **W.** $\frac{1}{2}$ **W.** must be steered, carrying not less than five fathoms, until Norwalk Light-house bears **E.** by **N.** $\frac{1}{2}$ **N.** and Shippan Point **W.** $\frac{3}{4}$ **S.**; when **NW.** by **N.** $\frac{3}{4}$ **N.** must be steered for the southern end of Norroaton Neck. Anchor on this course, when within a quarter of a mile of the southern end of that neck and two hundred yards to the southwestward of the buoy on The Middle, with Long Neck Point bearing **E.** by **S.** $\frac{1}{2}$ **S.**

The above courses pass a quarter of a mile to the southward of Long Neck Point Shoal; five-eighths of a mile to the eastward of Smith's Rock; and a quarter of a mile to the westward of Long Neck Point.

Or, you may, if on the northern side of the Sound, bring Norwalk Light-house to bear **NE.** $\frac{1}{4}$ **E.**, distant two miles and an eighth, and Long Neck Point **NW.** **Westerly**, distant a mile and a half, and steer **NW.** by **W.** $\frac{1}{2}$ **W.**, as before.

DANGERS

IN APPROACHING AND ENTERING DARIEN RIVER.

II. From the Westward.—In approaching this anchorage from the westward the first danger met with lies off Shippan Point and is known as The Cows. These are a group of detached rocks, bare at low water, three-quarters of a mile due **S.** from Shippan Point, and are marked

The Cows. by a red can-buoy* of the second class, placed in two fathoms on their southern side. The buoy (No. 26) bears from Great Captain's Island Light-house **E.** $\frac{3}{4}$ **N.**, distant four miles and three-quarters; and from it the red buoy on Smith's Rock bears **NE.** by **E.** $\frac{1}{2}$ **E.**, one mile and three-quarters, and Long Neck Point **NE.** by **E.**, nearly two miles and three-quarters distant.

To avoid The Cows, when in their vicinity, you should not go to the northward of Norwalk Light-house bearing **E NE.**

When past The Cows look out on the west side of the passage for Smith's Rock,—the buoy which will first be seen a little to the westward of the course into the harbor, bearing about **N.** by **E.** and nearly one mile off. This is a red spar-buoy (No. 24), placed off the southern end

Smith's Rock. of a ledge bare at low water, and half a mile long **N.** and **S.** It lies off Norroaton Bay and there is no passage to the northward of it. This buoy bears from the buoy on The Cows **NE.** by **E.** $\frac{1}{2}$ **E.**, one mile and three-quarters; from Long Neck Point **SW.** $\frac{1}{2}$ **W.**, nearly one mile; and from the southern end of Norroaton Neck **S.** by **W.** $\frac{1}{2}$ **W.**, seven-eighths of a mile distant. When past it the dangers are the same and are met with in the same order as when approaching from the eastward.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING DARIEN RIVER.

II. *From the Westward.*—On the course E. by N. $\frac{7}{8}$ N. through the Sound, when Great Captain's Island Light-house bears N. by W. $\frac{5}{8}$ W. and is nearly abeam, and Lloyd's Point E., four miles and three-quarters distant, steer NE. $\frac{3}{4}$ E. until Eaton's Neck Light-house bears SE., five miles and a half, and Long Neck Point NE. by N. $\frac{1}{4}$ N., one mile and three-quarters distant; when steer NNE. into the harbor, anchoring about three hundred yards to the southwestward of the red buoy on The Middle, with Long Neck Point bearing E. by S. $\frac{1}{2}$ S.

The above courses pass three-quarters of a mile to the southward of the red buoy on The Cows; three hundred yards to the eastward of Smith's Rock buoy; three-eighths of a mile to the westward of Long Neck Point Shoal; and a quarter of a mile to the westward of Long Neck Point.

Or, bring Norwalk Light-house to bear NE. by E. $\frac{3}{4}$ E., Long Neck Point NE. by N. $\frac{1}{4}$ N., and Eaton's Neck Light-house SE., and steer NNE., which course will lead to the red buoy on The Middle. This course passes three hundred yards to the eastward of the red buoy on Smith's Rock.

Or, you may bring Norwalk Light-house to bear ENE. and steer for it until Long Neck Point bears NE. by N., when NNE. will lead into the harbor, as before. The above courses pass a quarter of a mile to the southward of the red buoy on The Cows and three hundred yards to the eastward of the red buoy on Smith's Rock.

HUNTINGTON BAY.

This bay lies on the southern side of the Sound, between Eaton's Neck on the east and Lloyd's Neck on the west. It lies nearly N. and S., is two miles and a half long with an average width of one mile and a quarter, and affords excellent anchorage in from three to six fathoms, and good shelter in easterly, westerly and southerly winds, but is entirely open to the northward. At its southern end it is connected, by a passage nearly half a mile wide, with Northport Bay, a large bay of irregular shape, embraced between Eaton's Neck on the north and Little and Great necks on the south; and separated on the northeast from Long Island Sound by a strip of Beach called East Beach, which joins Eaton's Neck to the mainland. This bay lies nearly E. and W., is a little over two miles long and a mile and a quarter wide at its widest part, and is in no place less than five-eighths of a mile in width. It can be safely entered from Huntington Bay, through a channel about one hundred yards wide, with not less than three and a half fathoms, and affords most excellent anchorage in from four to nine fathoms, sheltered from all winds.

On the western shore of Huntington Bay opens Lloyd's Harbor, a shallow cove about three-quarters of a mile in diameter, with from two to ten feet in it at low water. At its western end makes in a shallow creek from two to three hundred yards wide, which extends to the westward one mile and a half, terminating about three hundred yards from the eastern shore of Oyster Bay and thus nearly separating Lloyd's Neck from the mainland.

Eaton's Point, the eastern point of entrance to Huntington Bay, is a bold bluff between eighty and ninety feet high, with a precipitous face about thirty feet high towards the north. Its western slopes are wooded, but its summit and eastern side are cleared, and on top of the bluff is built the light-house with the keeper's dwelling close to it. This light-house is known as Eaton's Neck Light-house, and is a stone tower sixty-three feet high, painted white. It shows a fixed white light, of the third order, from a height of one hundred and forty-seven feet above the sea, visible eighteen miles. The keeper's dwelling, also painted white, is remarkable for the peculiar black appearance of its windows. The geographical position of Eaton's Neck Light-house is

Latitude 40° 57' 12" N.
Longitude 73° 23' 45" W.,

and it bears from

	Miles.
Old Field Point Light-house, W. $\frac{1}{2}$ N.	a little over 12 $\frac{1}{2}$
Middle Ground Light-house, W. by S. $\frac{1}{2}$ S.	14 $\frac{1}{2}$
Southwest Ledge Light-house, SW. by W. $\frac{1}{4}$ W.	a little over 27
Stratford Point Light-house, SW. by W. $\frac{1}{4}$ W.	17 $\frac{1}{2}$
Penfield's Reef Light-house, SW. $\frac{1}{4}$ W.	about 12 $\frac{1}{2}$

From this light-house Norwalk Light-house bears N. $\frac{1}{4}$ W., about five miles and three-quarters; Great Captain's Island Light-house W. by N. $\frac{5}{8}$ N., nearly ten miles and a half; and Lloyd's Point (on the western side of the entrance) W. $\frac{1}{4}$ N., a little over four miles distant.

To the northwestward of the light-house and on the edge of the bluff will be seen a small white building with a tall pipe of the same color projecting from its roof. This contains the fog-signal, which is a second-order steam siren (in duplicate) and gives blasts nine seconds long at intervals of thirty-five seconds.

Lloyd's Neck, which forms the western shore of the bay, is a large peninsula lying nearly **E. and W.**, three miles long, half a mile wide at its eastern extremity, and gradually increases in width to its western end, where it is one mile and three-quarters wide. Its surface is hilly and for the most part wooded, except on its southern side, where there is considerable cleared land dotted with houses. On its southern side makes in Lloyd's Harbor, above mentioned, which separates it from West Neck. Its eastern extremity, which abuts upon the bay, is called **East Fort**, from an old earthwork on its summit. It is a steep bluff, about eighty feet high, with perpendicular face. It is cleared near the top on the edge, but the rest of the surface is thickly wooded; and at its base is a remarkable tall boulder whose peculiar appearance renders the point unmistakable.

The eastern shores of the bay are formed by Eaton's Neck, of which Eaton's Point is the northern end. It is composed of a series of gently sloping hills separated by narrow valleys, and its surface appears, therefore, undulating. It is diversified with wooded and cultivated lands, the summits being for the most part cleared. A prominent feature on approaching the bay is a remarkable perpendicular sandy cliff about one hundred feet high, with nearly level summit,—on which stand two tall Lombardy poplars. This cliff is about one mile and a half to the southward of Eaton's Point. Eaton's Neck terminates to the southwestward in a long, flat, sandy point, dotted with hillocks and clumps of low scrub and called

Eaton's Neck. **West Beach.** It forms the northern point of entrance to Northport Bay, which here makes in to the eastward by a passage half a mile wide. The southern side of the neck is indented by two large coves called Cow Harbor and Duck Island Harbor,—both opening out of Northport Bay. The former, which is the westernmost, makes in between Winkle or Gardiner's Point on the east and the southern end of West Beach on the west and has from five to seven feet at low water. The latter, which is only separated from the Sound by a strip of beach fifty yards wide, makes in between Duck Island on the east and Winkle Point on the west and has from six to sixteen feet. Both of these harbors are convenient anchorages for small vessels.

On the western side of Huntington Bay from East Fort the shore trends about **S. by W.** for nearly one mile, terminating in what is known as **East Beach**,—the northern point of entrance to Lloyd's Harbor. East Beach is a mere narrow strip of sand commencing about a quarter of a mile below East Fort and extending to the southward for about three-quarters of a mile. On its southern end will be seen a square white tower attached to a dwelling house (also white) and surmounted by a lantern. This is Lloyd's Harbor Light-house, and shows a fixed white light, of the fifth order, from a height of forty feet above high water, visible twelve miles. Its geographical position is

Latitude	40° 54' 55" N.
Longitude	73° 26' 4" W.

and it bears from Eaton's Neck Light-house **SW. Nearly**, distant three miles.

The entrance to Lloyd's Harbor is about nine hundred yards wide; but the available channel is only about three hundred and fifty yards wide, with a depth of from seven to thirteen feet at low water. The harbor is only available for small vessels, and much better anchorage is found in Northport Harbor, on the eastern side of the bay.

The southern shore of Lloyd's Harbor is formed by West Neck, which is composed almost entirely of cultivated lands dotted here and there with groves of trees. The land rises somewhat steeply to a height of about one hundred feet, with a level cleared summit, almost entirely under cultivation. On the east the land descends to a low, level, cleared point with steep faces and occasional small groves of trees, forming the western point of entrance to Huntington Harbor, a long and narrow cove extending to the southeastward for one mile and a quarter. This point is called **Kellum's Point**. It is very shoal in its approaches and should be given a berth of about seven hundred yards.

Huntington Harbor is a cove of irregular shape making into the northern shore of Long Island between East and West necks. At its entrance, between Kellum's Point and East Neck, it is only about two hundred and fifty yards wide; but it soon widens to about four hundred yards, which width it keeps to its head, where is situated the village of **Huntington**. **East Neck**, its eastern point of entrance, is the western extremity of Great Neck, which forms the southern shore of Huntington Bay. It is bare of trees except at its southwestern end, where there is a rather steep wooded hill about sixty feet high. The eastern shore of Huntington Harbor, which is formed by the western side of **Great Neck**, has a very irregular outline, rises somewhat steeply from the beach to a height of from eighty to one hundred feet, and is bare of trees. The shore near the water's edge is dotted with houses and there are a number of projecting wharves. The thickly clustered houses in the village of Huntington are seen at the head of the harbor and along the slopes of the hills.

The western shore of the harbor is formed by the eastern end of West Neck, and shows high land varying in height sixty to ninety feet, for the most part cleared, but with occasional small groves of trees. Into this western shore, about eighths of a mile below the entrance, there makes in a small shallow creek, terminating in a mill-dam separating it from a pond about three hundred and fifty yards in diameter. There is a small settlement here.

Not more than eight feet at low water can be taken into Huntington Harbor, and this only through a narrow and crooked channel which is not buoyed and is entirely unsafe for strangers.

The southern shores of Huntington Bay are formed by Great Neck, which is hilly and undulating, shows cleared and wooded lands alternately, and varies in height from forty to one hundred feet. The northeastern point of this neck forms the point of entrance to Northport Bay and West Beach forms the northern point. It is a bluff about eighty feet high, thinly wooded on its eastern side, and showing precipitous sandy faces about twenty feet high to the northward.

On the northern shore of Northport Bay, between West Beach and **Winkle** or **Gardiner's Point**, makes in **Cow Harbor**, or **Price's Bend** as it is sometimes called. It is a shallow cove, about three-quarters of a mile long **N NW.** and **S SE.**, three-quarters of a mile wide at its mouth, but rapidly contracting until at its head it is only three hundred yards wide. It is fit only for small vessels, — anchorage being limited to a depth of from five to seven feet at low water.

On the eastern side of **Winkle Point** makes in another cove, of very irregular shape, called **Duck Island Harbor**. Its eastern point of entrance, known as **Duck Island Bluff**, is the southwestern extremity of **Duck Island**, — a neck of land connected with the outside beach by salt-meadow, and formed by two hills about one hundred feet high, separated by low, sandy and marshy land, and looking, when seen from the southeastward, like two separate islands. It lies **NE.** and **SW.** and is half a mile long. Its northeastern end is formed by a hill one hundred feet high with wooded slopes and grassy summit, and low cliffs about twenty feet high on its northern and eastern sides. The southwestern end of the island is formed by **Duck Island Bluff**, — a very remarkable looking round hill about one hundred feet high, thinly wooded, and showing a perpendicular bluff about forty feet high at its southern end. Between this bluff and **Winkle Point** the entrance to **Duck Island Harbor** is half a mile wide; but it rapidly contracts to a width of an eighth of a mile three-eighths of a mile above **Winkle Point**. This narrow passage is called **The Narrows**, and is embraced between the sand beach on the western side of **Duck Island** and a similar beach, called **Clam Shell Beach**, on the south side of **Eaton's Neck**. Between the two eleven feet at low water may be carried.

**Duck Island
Harbor.**

Beyond **The Narrows** the harbor spreads out to a width of three-eighths of a mile and is all shallow, — having from two to six feet water in it. Its northern shore is formed by **Walnut Neck**, an island of fast land surrounded by marsh and very similar in appearance to **Duck Island**. It lies **NW.** and **SE.**, is about three-eighths of a mile long, and is composed of two thinly wooded hills one hundred feet high, with steep faces about fifteen feet high to the southward. At the base of the hills is a narrow strip of sand extending to the southeastward into a point known as **Walnut Point**. On the eastern side of **Walnut Neck** an arm of the harbor extends to the northwestward for about three-eighths of a mile, between the neck and **East Beach**. It is of no importance, as it is almost entirely bare at low water.

Walnut Neck.

The southern shore of Northport Bay is indented by two large coves, forming convenient harbors for small vessels. The westernmost, which is called **Centreport Harbor**, makes in between **Little Neck Point** on the east and **Great Neck Point** on the west, — its eastern shores being formed by **Little Neck** and its western shores by **Great Neck**. It is a long and narrow cove of irregular shape, running in a **S SE.** direction for a little over one mile to the village of **Centreport**, where it is crossed by a dike, separating it from a pond about six hundred yards long. The harbor is shoal, — not more than two feet at low water being found in the channel beyond **Centreport Beach**.

**Centreport
Harbor.**

Little Neck Point, the eastern point of entrance, is the northern extremity of **Little Neck**, and appears as a thinly wooded, somewhat steep hill, about one hundred feet high. From this point the western side of **Little Neck** is faced by a narrow strip of beach, called **Centreport Beach**, three-quarters of a mile long, extending in a **SW.** by **S.** direction nearly over to **Great Neck**, — leaving a passage but a little over one hundred yards wide into the inner harbor. **Little Neck Point**, **Little Neck**, which, as above mentioned, forms the eastern shore of the harbor, is composed of a series of thinly wooded hills from sixty to one hundred and fifty feet in height and presents an undulating appearance. **Great Neck**, which forms the western shore, has a very similar appearance, — the hills varying in height from one hundred to one hundred and fifty feet. There is a small settlement close to the beach, about five-eighths of a mile below **Great Neck Point**, on the banks of a very small stream making into the low lands between the hills.

Great Neck Point is the northern extremity of **Great Neck**, and appears as a thickly wooded hill about eighty feet high, with precipitous sandy face to the northward about thirty feet high. It is fringed with a narrow sand beach, which extends along the whole northern and eastern face of the neck to the head of the harbor.

On the western side of the harbor, directly opposite to the southern end of **Centreport Beach**, there is a small clearing, with a few houses in it, at the base of a hill about one hundred feet high, having a perpendicular face about twenty feet high on its eastern side, marking the western point of entrance to the inner harbor. Above this the land is hilly and wooded except on the low shore at the base of the hills, which becomes more and more thickly settled as you approach the village.

On the southern side of **Centreport Beach** the harbor spreads out into a nearly circular basin about six hundred yards in diameter, but very shoal, and obstructed in the middle by a sand bar bare at extreme low tides. From the southern end of this basin to the dam the harbor varies in width from one hundred and fifty to three hundred yards and at low spring tides is entirely bare.

The easternmost of the two coves indenting the southern shore of Northport Bay is called **Northport Harbor**, has good anchorage in from six to ten feet at low water, and is entirely unobstructed. Its entrance, between **Bluff Point** on the east and **Little Neck Point** on the west, is three-quarters of a mile wide, but it rapidly contracts to three-eighths of a mile, which width it keeps without sensible variation to the head of the cove, about a mile above **Bluff Point**. The village of **Northport** is built upon its eastern bank, about five-eighths of a mile above **Bluff Point**, occupying a narrow strip of low land between two wooded hills.

Northport Harbor.

Bluff Point, the eastern point of entrance to **Northport Harbor**, is a nearly circular hill about one hundred and twenty feet high, showing a very steep slope to the northwestward and thinly wooded. A narrow strip of sand skirts the base of this hill and extends along the whole of the eastern shore to the head of the cove. This eastern shore is composed of a number of hills varying in height from eighty to one hundred and twenty feet, with wooded slopes, but

Bluff Point.

their summits for the most part cleared. Houses are scattered at intervals along the beach and at the village there is a large wharf. Just to the southward of the narrow valley in which the village stands the shore shows perpendicular sandy faces about twenty feet high, and has a somewhat gentle rise from the top of the cliff to a height of about one hundred and fifty feet, for the most part wooded. Beyond this it is mostly marsh fringed with beach, and backed by fast land, gently sloping, and for the most part under cultivation. The settlement extends all along this shore just back of the marshes.

The western shore of the harbor is formed by Little Neck, which, when viewed from the eastward, appears hilly and undulating, thinly wooded, and faced by a narrow sand beach. The hills vary in height from sixty to two hundred feet, with narrow valleys between them, and show precipitous faces from ten to twenty feet high on the harbor side. Directly opposite the village the beach which skirts the shore extends out in a **SSE.** direction towards the middle of the harbor, forming a bare spit, about four hundred and fifty yards long, called **Northport Beach.** It is fringed with marsh and diminishes the available width of the harbor at this point to about a quarter of a mile.

DANGERS

IN APPROACHING AND ENTERING HUNTINGTON BAY.

I. From the Eastward.—In approaching this harbor from the eastward the first danger met with lies off Eaton's Point and is known as Eaton's Point Shoal. It extends to the northeastward for about nine hundred yards with from two to six feet water; and there is not more than sixteen feet for five-eighths of a mile to the northward of this,—a long shoal making to the northward for that distance. There is a black spar-buoy (No. 13) on the northern extremity of this shoal in fifteen feet water,—bearing from

	Miles.
Eaton's Neck Light-house, N. $\frac{5}{8}$ E.	$12\frac{3}{4}$
Old Field Point Light-house, W. $\frac{1}{2}$ N.	$14\frac{1}{2}$
Middle Ground Light-house, W. by S. $\frac{1}{4}$ S.	$14\frac{1}{2}$

From this buoy Norwalk Light-house bears **N. $\frac{3}{8}$ W.**, distant four miles and seven-eighths, and the black buoy on Lloyd's Point Shoal **W. $\frac{3}{8}$ S.**, distant a little over four miles and a quarter. Between the northeastern end of the shoalest part of the reef and buoy No. 13 there exists a channel about half a mile wide with not less than sixteen feet, but as the buoy is liable to get out of position it is best for strangers not to attempt to pass through.

In beating in do not approach East Fort nearer than five hundred yards, as there is a bare rock and a number of rocks awash about two hundred yards from that point. Also, the western shore of Eaton's Neck should not be approached nearer than five or six hundred yards, as there is less than eighteen feet at a distance of four hundred yards from that shore.

On the western side of the bay look out for *East Beach Flats*, which extend off from that beach between eight and nine hundred yards and have five feet at low water more than a quarter of a mile from shore. They are not marked in any way and the only safe guide in avoiding them is the lead,—sounding frequently, and not standing into less than four fathoms.

Lloyd's Harbor is all flats and no intelligible description can be given of its dangers,—none of which are marked. The best water in entering is close under the southern end of East Beach, which may be approached within fifty yards with not less than twelve feet. The usual anchorage is just to the southwestward of the point, in ten feet at low water; but small vessels frequently haul directly around the point and come to on its western side, where they lie aground at low water in soft mud.

If bound into *Huntington Harbor* you will see, on approaching the entrance, two spar-buoys,—one red and one black,—marking the limits of the channel. The red buoy is on the western side of the entrance and marks the northeastern extremity of Kellum's Point Reef, a very dangerous reef making off from Kellum's Point in a **NE. $\frac{1}{2}$ E.** direction four hundred yards. It is nearly all bare at low water, and has a sunken rock with two feet upon it at its northeastern end. This is called *Pelt Rock*, and the buoy, which is marked No. 2, is placed in seven feet water close to it. It bears from Eaton's Neck Light-house **SW. $\frac{1}{2}$ S.**, a little over three miles; from East Fort **S. by W. Westerly**, one mile and an eighth; and from Lloyd's Harbor Light-house **S. $\frac{1}{2}$ E.**, three-eighths of a mile distant. The deepest water in entering is close to this buoy.

The black spar-buoy on the eastern side of the entrance marks Mulligan's Reef, which makes off from the northern side of East Neck for about four hundred and fifty yards, is bare at low water three hundred yards from shore, and has six feet at its northwestern end. The buoy is marked No. 1 and is distant from the red buoy on Kellum's Point Reef about one hundred and fifty yards in a southeasterly direction, which is here the width of the channel.

Strangers cannot enter Huntington Harbor, nor can any intelligible description be given of the numerous flats and other dangers by which it is obstructed. A pilot can always be obtained, either at Eaton's Neck Light-house or at Lloyd's Harbor, by making the usual signal.

If bound into Northport Bay the first danger met with, on approaching the passage between West Beach and Great Neck, is West Beach Flats, which make off to the southward for six hundred yards from the southern end of West Beach and have from one to five feet upon them at low spring tides. A black spar-buoy (No. 1) is placed on the southern edge of these flats to mark the northern limits of the channel, and bears from the southern end of West Beach **S. by E. $\frac{1}{4}$ E.**, six hundred and fifty yards distant, and from Lloyd's Harbor Light-house **E. by S. $\frac{3}{4}$ S.**, a little over one mile and a half distant. On coming up with it a black spar-buoy will be seen a little to the northward of the course and about three-eighths of a mile off; and a red spar-buoy a little to the southward of the course and half a mile off. The former is on the eastern end of West Beach Flats, which here send off an arm to the eastward between eight and nine hundred yards long with from seven to twelve feet upon it at low water. The buoy is marked No. 3, placed in sixteen feet at mean low water, and bears from the black buoy on the southern end of the flats **E. by N. $\frac{3}{4}$ N.**, a quarter of a mile, and from the southern extremity of West Beach **SE. by E. $\frac{1}{2}$ E.**, nearly half a mile distant.

**West Beach
Flats.**

The red buoy on the southern side of the channel marks the northern end of Great Neck Flats, which make in a northeasterly direction from the northern shore of that neck about a quarter of a mile to the eastward of Great Neck Point. These flats extend off shore four hundred yards with from two to four feet upon them at low spring tides; and the buoy, which is marked No. 2, is placed in thirteen feet just clear of their northeastern end. It bears from Great Neck Point **E. by N. Northerly**, three-eighths of a mile; from the southern extremity of West Beach **SE. $\frac{3}{4}$ E.**, five-eighths of a mile; and from Little Neck Point **W. $\frac{1}{2}$ S.**, about fourteen hundred yards distant. When past this buoy an unobstructed anchorage about one mile in diameter, with from four to nine fathoms in it, is open before you, and you may anchor at discretion, on the eastern side of West Beach, in from four to seven fathoms; off the entrance to Duck Island Harbor in from four to six fathoms; or in the entrance to Centreport Harbor in from four to seven fathoms.

**Great Neck
Flats.**

Vessels intending to enter Northport Harbor should, when abreast of the red spar-buoy on Great Neck Flats, steer to the northeastward about for the middle of the wooded hillock on East Beach. On this course there are no dangers; but, if beating in, Duck Island Bluff should not be approached nearer than six hundred yards to avoid Duck Island Shoal, which extends to the southwestward from the foot of the bluff for four hundred and fifty yards and has from two to four feet upon it at low spring tides. It is not buoyed, but it is easily avoided by not standing to the northward of the southern extremity of West Beach bearing **W. by S.**

**Duck Island
Shoal.**

On the southern side of the entrance do not approach Little Neck Point nearer than a quarter of a mile to avoid *Little Neck Point Shoal*, which makes to the northward from that point for an eighth of a mile and has from two to eight feet upon it. It is not buoyed, and in order to avoid it you should not stand farther to the southward than to bring the southern extremity of West Beach to bear **W. $\frac{1}{4}$ N.**

East Beach, between Duck Island Bluff and the mainland, should not be approached nearer than a quarter of a mile, as the flats extend off from it for from two to four hundred yards with a depth of from one to six feet at low springs.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING HUNTINGTON BAY.

I. From the Eastward.—1. Having come through the Main Channel of Long Island Sound.—On the **W. by S. $\frac{1}{8}$ S.** course through the Sound, when exactly between Norwalk Light-house and Eaton's Neck Light-house,—the former bearing **N. $\frac{1}{4}$ W.**, two miles and three-eighths, and the latter **S. $\frac{1}{4}$ E.**, three miles and a quarter distant,—steer **S. by W. $\frac{1}{4}$ W.**, which will lead with not less than five fathoms into the bay, and with not less than three and a half fathoms to the anchorage under East Neck. Vessels may anchor in from four to five fathoms about three-eighths of a mile to the northward of East Neck, where they will be sheltered from all except northerly winds.

Wishing to enter Lloyd's Harbor.—When the light-house bears **W. $\frac{1}{4}$ N.**, a little over half a mile distant, in three and a half fathoms, steer **W. $\frac{1}{2}$ S.**, carrying not less than twelve feet, until to the westward of the southern point of East Beach, in ten feet at low water, where you may anchor; or, haul directly around the point to the northward and come to on its western side, where you may lie aground at low water in soft mud.

Wishing to enter Huntington Harbor.—When Lloyd's Harbor Light-house bears **W. $\frac{1}{4}$ N.**, a little over half a mile distant, as before, steer **SW. $\frac{3}{8}$ W.**, which course will lead midway between the red buoy on Pelt Rock and the black buoy on Mulligan's Reef. Beyond this you cannot go without a pilot.

Sailing Directions--Huntington Bay. The course into the bay passes three-quarters of a mile to the westward of the western edge of Eaton's Point Shoal; one hundred and fifty yards to the eastward of East Beach Flats; and three-eighths of a mile to the westward of the shoals off the western side of Eaton's Neck.

2. Having come through the South Channel of Long Island Sound.—On the $W. \frac{1}{4} N.$ course from off Friar's Head, when Eaton's Neck Light-house bears $S.$, distant one mile and an eighth, and Lloyd's Point $W.$ by $S. \frac{1}{2} S.$, distant nearly four miles and a quarter, you will have four and a half fathoms and must steer $SW.$ by $S. \frac{1}{4} S.$ for about one mile and a half until Eaton's Neck Light-house bears nearly $E.$ by $N.$, a little over three-quarters of a mile distant. Here you will have six fathoms, and $S. \frac{3}{4} W.$ will lead, with not less than three and a half fathoms, to the anchorage under Great Neck. In anchoring you should not approach the Great Neck shore nearer than six hundred yards.

Wishing to enter Lloyd's Harbor.—When the light-house bears $W.$ by $S. \frac{1}{2} S.$, a little over a mile distant, and East Fort $NW.$ by $W.$ Nearly, seven-eighths of a mile distant, steer $SW. \frac{1}{2} W.$ until the light-house bears $W. \frac{1}{4} N.$, distant a little over half a mile; when $W. \frac{1}{2} S.$ will lead into the harbor, as before.

Wishing to enter Huntington Harbor.—Continue the $SW. \frac{1}{2} W.$ course from the above position, which will lead midway between the red buoy on Pelt Rock and the black buoy on Mulligan's Reef.

The above courses pass a quarter of a mile to the westward of the western edge of Eaton's Point Shoal; three hundred and fifty yards to the westward of the shoals off the western shore of Eaton's Neck; and three-eighths of a mile to the eastward of East Beach Flats.

On the above courses, to enter Northport Bay.—Continue the $S. \frac{1}{4} W.$ course until within three-eighths of a mile of the south shore of the bay and Lloyd's Harbor Light-house bears $NW.$ by $W. \frac{1}{4} W.$ Now steer $SE.$ by $E. \frac{1}{4} E.$ for about six hundred yards until the southern extremity of West Beach bears $NE.$ by $N. \frac{1}{2} N.$, about eight hundred and fifty yards distant, and the northern extremity of Little Neck Point $E. \frac{3}{4} N.$ Steer for the latter for about a quarter of a mile, carrying not less than three and a half fathoms, until up with the black buoy on the southern end of West Beach Flats. Pass about fifty yards to the southward of this buoy, in three and a half fathoms, and steer $E. \frac{1}{2} N.$, which course will lead, with not less than three and three-quarter fathoms, into the bay, passing about midway between the black buoy on the southeastern end of West Beach Flats and the red buoy on the northeastern end of Great Neck Flats. When to the eastward of these buoys you may anchor anywhere in from five to nine fathoms, well sheltered from all winds. *But, if bound into Northport Harbor,* when you come abreast of the red buoy on Great Neck Flats steer $E NE.$ Northerly, about for the middle of the wooded hillock on East Beach, until the summit of Bluff Point bears $SE.$ by $E. \frac{1}{4} E.$, where you will have fifteen feet and must steer for the point, carrying not less than eleven feet for a quarter of a mile, until the middle of Duck Island Bluff bears $NW.$ by $N. \frac{1}{2} N.$; and $SE.$ by $S. \frac{1}{4} S.$ will lead safely into the harbor. Anchorage is found in this harbor in from six to ten feet at low water, sheltered from all winds.

The above courses pass two hundred yards to the northward of the northern edge of the shoals off Great Neck; one hundred and fifty yards to the southward of the southern end of the shoals off Eaton's Neck; fifty yards to the southward of the black buoy on the southern end of West Beach Flats; about one hundred yards to the southward of the black buoy on the southeastern end of those flats; one hundred and fifty yards to the northward of the red buoy off Great Neck Flats; a quarter of a mile to the southward of Duck Island Shoal; a little over one hundred yards to the northward and two hundred yards to the eastward of Little Neck Point Shoal.

To enter Duck Island Harbor.—On the $E NE.$ Northerly course towards the wooded hillock on East Beach, when Little Neck Point and the summit of Bluff Point are exactly in range on a bearing of $E.$ by $S. \frac{3}{4} S.$ and the middle of Duck Island Bluff bears $NE.$ by $N. \frac{1}{2} N.$, distant five-eighths of a mile, steer $N.$ by $E. \frac{1}{4} E.$, which will lead safely into the harbor, where you may anchor in from four to nine feet at low water.

To enter Price's Bend.—When between the red buoy on Great Neck Flats and the black buoy on the southeastern end of West Beach Flats round the latter to the northward, giving it a berth to the westward of two hundred yards, and steer $N. \frac{1}{4} W.$ into the Bend, anchoring under Winkle Point in from seven to eleven feet at low water.

To enter Centreport Harbor.—When abreast of the red spar-buoy on Great Neck Flats round it to the southward, giving it a berth to the westward of about one hundred and fifty yards, and steer **SE. by S. $\frac{1}{4}$ S.** for three-eighths of a mile, until Little Neck Point bears **NE. $\frac{1}{4}$ E.** Here you must anchor in four fathoms and wait for a pilot, as you cannot pass beyond Centreport Beach without one.

Or, on the W. $\frac{1}{4}$ N. course through the South Channel of Long Island Sound, when Eaton's Neck Light-house bears **S. by E. $\frac{1}{2}$ E.**, distant nearly one mile and a quarter, and East Fort **SW. by S. $\frac{1}{4}$ S.**, distant two miles and three-quarters, steer **S. by W. $\frac{3}{8}$ W.**, which will lead with not less than five fathoms into the bay, and with not less than three and a half fathoms to the anchorage under East Neck. *On this course, wishing to enter Lloyd's Harbor:* When the light-house bears **W. by S. $\frac{1}{2}$ S.**, distant nearly one mile, steer **W SW.**, and anchor, when to the westward of the southern end of East Beach, in from ten to thirteen feet at low water. *Or, wishing to enter Huntington Harbor:* With Lloyd's Harbor Light-house bearing **W. by S. $\frac{1}{2}$ S.**, as before, steer **SW. $\frac{3}{8}$ W.**, which will lead about midway between the red buoy on Pelt Rock and the black buoy on Mulligan's Reef.

The above courses pass three-eighths of a mile to the westward of the western edge of Eaton's Point Shoal; four hundred yards to the westward of the flats off the western shore of Eaton's Neck; and six hundred yards to the eastward of East Beach Flats.

On the S. by W. $\frac{3}{8}$ W. course, to enter Northport Bay.—With East Fort bearing **NW. $\frac{1}{4}$ W.**, distant three-quarters of a mile, and Lloyd's Harbor Light-house **W. by S. $\frac{1}{2}$ S.**, distant nearly one mile, steer **S. $\frac{1}{4}$ E.** until the latter bears **NW. by W. $\frac{1}{4}$ W.**, when steer **SE. by E. $\frac{3}{4}$ E.** and follow the directions previously given.

DANGERS

IN APPROACHING AND ENTERING HUNTINGTON BAY.

II. From the Westward.—In approaching this harbor from the westward there is but one danger met with before entering the bay. This lies off Lloyd's Point and is known as Lloyd's Point Shoal. It has fourteen feet at low water near its northern end; and a rock called *Morris' Rock*, with two feet, lies half a mile to the eastward of Lloyd's Point. A black spar-buoy, marked No. 15, is placed in three fathoms just clear of the northern end of the shoal; but small vessels frequently pass to the southward of it, giving it a berth to the northward of three hundred yards and carrying not less than fourteen feet. The whole of the northern shore of Lloyd's Neck is shoal and should not be approached nearer than half a mile. About six hundred yards to the eastward of **Northeast Bluff** a reef of rocks makes to the northward for about three-eighths of a mile with from one to two feet upon it; and about midway between this reef and East Fort there is another reef, which has a rock awash upon it, four hundred yards from shore. Neither of these is buoyed, and to avoid them it is necessary, as above mentioned, not to approach the northern shore of the neck nearer than a mile.

When up with East Fort the dangers in the bay are the same as those described in the approaches from the eastward, on pages 478–479.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING HUNTINGTON BAY.

II. From the Westward.—On the **E. by N. $\frac{3}{8}$ N.** course from off Sands' Point, when Eaton's Neck Light-house bears **E. by S. $\frac{1}{4}$ S.** and Lloyd's Point **SE. $\frac{3}{8}$ E.** you will have ten fathoms and must steer for the light-house, carrying not less than eight fathoms, until East Fort bears **SE. $\frac{3}{4}$ S.** and Lloyd's Point **SW. by W. $\frac{3}{4}$ W.** The tidal current sets directly across this course,—the flood running to the southwestward and the ebb to the northeastward at the rate of about one mile an hour,—so that care must be taken to keep Eaton's Neck Light-house bearing **E. by S. $\frac{1}{4}$ S.** When East Fort bears **SE. $\frac{3}{4}$ S.** and Lloyd's Point **SW. by W. $\frac{3}{4}$ W.**, as above mentioned, you will have eight fathoms and must steer **SE. $\frac{1}{4}$ S.**, about for the middle of the woods on West Beach, carrying not less than four and three-quarter fathoms. On this course, when East Fort bears **W. $\frac{1}{2}$ S.** Nearly, distant about half a mile, and Eaton's Neck Light-house **NE. $\frac{3}{8}$ E.**, distant one mile and three-quarters, you will have five fathoms, and, *if bound into Lloyd's Harbor or Huntington Harbor*, must steer **S. by W. $\frac{1}{4}$ W.**, and follow the directions for those harbors on page 479; or, *if bound into Northport Bay*, you must steer **S. $\frac{3}{4}$ E.** until Lloyd's Harbor Light-house bears **NW. by W. $\frac{1}{4}$ W.**; after which the directions for entering the bay must be followed. (See page 480.)

The above courses pass three-eighths of a mile to the northward of the black spar-buoy on Lloyd's Point Shoal; five-eighths of a mile to the northeastward of the reef to the eastward of Northeast Bluff; three-eighths of a mile to the eastward of the rock awash about one mile to the westward of East Fort; six hundred yards to the eastward of the bare rocks off East Fort; and from one hundred and fifty to four hundred yards to the eastward of East Beach Flats, according as you are bound for Lloyd's Harbor or Northport Bay.

LIGHT-HOUSES.

NAME.	Latitude.	Longitude West.			Fixed or Revolving.	Height above sea-level.	Distance visible in nautical miles.
		In arc.		In time.			
	° ' "	° ' "	h. m. s.		Feet.		
Eaton's Neck Light-house	40 57 12	73 23 45	4 53 35.0	Fixed.	147	18	
Lloyd's Harbor Light-house	40 54 55	73 26 4	4 53 44.3	Fixed.	40	12	

TIDES.

	Huntington Bay.	Lloyd's Harbor.
Corrected Establishment	10 ^h 51 ^m	11 ^h 1 ^m
Mean Rise and Fall of tides	7.6 ft.	7.6 ft.
Mean Rise and Fall of Spring tides	8.9 ft.	8.8 ft.
Mean Rise and Fall of Neap tides	6.2 ft.	6.5 ft.
Mean duration of Rise	6 ^h 12 ^m	6 ^h 20 ^m
Mean duration of Fall	6 ^h 13 ^m	6 ^h 7 ^m
Mean duration of Stand	0 ^h 15 ^m	0 ^h 15 ^m
Rise of highest tide observed	9.6 ft.	9 ft.

CURRENTS.

Off Huntington Bay the current of ebb sets about NE. by E. $\frac{1}{2}$ E. with a velocity of about one mile and a quarter per hour; while the current of flood sets about SW. $\frac{1}{2}$ S. with nearly the same velocity. (See Current Table for Long Island Sound.)

VARIATION OF THE COMPASS.

The magnetic variation for 1880, in the vicinity of Eaton's Point, is 8° 16' W., with an approximate annual increase of 2 $\frac{1}{2}$ '.

STAMFORD HARBOR.

This harbor lies on the northern side of the Sound, at the mouth of a shallow stream called Mill River. Its eastern point of entrance is formed by Shippan Point, which separates it from Westcott's Cove on the east. (See page 370.) Shippan Point is about two miles and a half W. by S. $\frac{1}{2}$ S. from Long Neck Point, and appears, when viewed from the southward, very gently sloping, cleared, cultivated, dotted with a few trees and, at some distance back from the shore, crowned with a thick growth of bushy trees. It is very foul in its approaches and vessels should not attempt to pass inside The Cows, which lie three-quarters of a mile to the southward of it.

The western point of entrance to Stamford Harbor is called Peck's Point and lies three-quarters of a mile NNW. from Shippan Point. It is low and marshy, terminates to the southward in a flat sand beach thickly strewn with boulders, and is backed by a nearly level country under fine cultivation.

Stamford Harbor is about five-eighths of a mile in diameter, but so full of shoals as to be very dangerous to enter without a pilot. From eleven to thirteen feet is found at the usual anchorage, which is just under Shippan Point; but vessels may pass three-eighths of a mile to the northward of this anchorage with not less than seven feet at low water. None of the shoals (with one exception only) are buoyed; and in the absence of such marks strangers should not attempt to enter the harbor except in cases of emergency.

Off the mouth of Mill River, a little over eight hundred yards NE. by E. $\frac{1}{2}$ E. from Peck's Point and five-eighths of a mile NW. $\frac{1}{2}$ N. from Shippan Point, lies a very small low islet, covered with grass and surrounded at low water by marsh. It is called Grassy Island, lies nearly N. and S., is fifty yards long at high water and two hundred and fifty at low water. There are also a number of bare rocks scattered over the area between the island and the mouth of the river.

Mill River has a general course about due N. for a little over one mile and a quarter to the village of Stamford. It is about a quarter of a mile wide at its mouth, but rapidly contracts its banks to a width of about two hundred yards, which it keeps, with little variation, for half a mile, where a long level point, thickly dotted with houses, suddenly projects from its western bank,—diminishing the width of the stream to thirty yards. Here also the river is crossed by a bridge or causeway, preventing farther navigation. The bridge carrying the New York and New Haven Railroad crosses the stream about an eighth of a mile above this causeway and a quarter of a mile below the village. The channel is a mere thread at low water and not more than two feet can be taken up to the causeway. Both banks are composed of low level lands in many places fringed with marsh, under fine cultivation and well settled.

DANGERS

IN APPROACHING AND ENTERING STAMFORD HARBOR.

I. From the Eastward.—In approaching this harbor from the eastward the first danger met with is called *The Cows*. They are a group of bare rocks three-quarters of a mile due **S.** from Shippan Point with an eighteen feet channel to the northward of them, which is not, however, safe for strangers. A red can-buoy* of the second class, marked No. 26, is placed on their southern side in two fathoms at low water,—Norwalk Light-house bearing **E.** by **N.** $\frac{3}{4}$ **N.**, five miles and a quarter, and Great Captain's Island Light-house **W.** $\frac{3}{4}$ **S.**, four miles and three-quarters distant. *The Cows.*

In standing to the northward on a wind vessels should go about as soon as Norwalk Light-house bears **E NE.** or Great Captain's Island Light-house **W.** $\frac{1}{2}$ **S.**, in order to avoid *The Cows*.

When past *The Cows*, and hauling up for the entrance to the harbor, Shippan Point should receive a berth to the northeastward of not less than half a mile to avoid the dangerous Shippan Point Shoals, which make off in a **SW.** by **S.** direction for about eight hundred yards and are not marked except by the bare rocks upon them. These shoals are composed of a great mass of bare and sunken rocks; and there are a number of rocks *awash* about one hundred yards outside of their southern limits, so that it is unsafe in going into the harbor to give this point a berth of less than five-eighths of a mile to the northeastward and a quarter of a mile to the eastward. *Shippan Point Shoals.*

On the western side of the eastern entrance, and almost exactly in the middle of the harbor, lies Stamford Middle Ground, a rocky shoal, bare in places at low water and in others having from two to four feet upon it, which extends nearly **N NE.** and **S SW.** for about five-eighths of a mile. Its southern end is marked by a bare rock; about three hundred yards to the northeastward of this is another small bare rock near the eastern edge of the bank; three hundred and fifty yards to the northward of this is another, marking the middle of the shoal; and about the same distance still farther to the northeastward is still another bare rock about an eighth of a mile to the southward of the northern extremity of the shoal. These rocks are excellent marks for avoiding the Middle Ground, as by giving them a berth of two hundred yards to the eastward you will pass clear of all danger. Off the eastern side of the Middle Ground, to the northeastward of the bare rock at its southern end and nearly opposite the southwestern extremity of Shippan Point, is placed a black nun-buoy of the second class, marked No. 1. This buoy marks the southeastern end of what is locally known as *Harbor Ledge*, which forms part of the Middle Ground. It bears from the buoy on *The Cows* **NW.** $\frac{1}{4}$ **W.**, seven-eighths of a mile distant. *Stamford Middle Ground.*

After passing Shippan Point and fairly in the harbor do not approach the eastern shore nearer than four hundred and fifty yards, as it is all flat,—*two feet at low water being found in several places* two hundred and fifty yards from shore, and in no place more than five feet at that distance.

There is equally good water on both sides of the Middle Ground;—what is known as the **Western Channel** passing to the westward of the shoal, between it and Greenwich Neck, and carrying not less than thirteen feet to the usual anchorage; but vessels from the eastward invariably enter by the **Eastern Channel**.

To the eastward of the northern end of Stamford Middle Ground, nearly three hundred yards from the northernmost bare rock and three hundred and fifty yards to the southward of Grassy Island, is a detached shoal spot with five feet at low water; and one hundred and fifty yards to the northward of this, and over two hundred yards to the southeastward of Grassy Island, is another shoal with four feet. Neither is buoyed, and they are not easily avoided except by those who are thorough local pilots, the usual anchorage is, however, some distance to the southward of these shoals; and they do not therefore, interfere with the movements of vessels seeking shelter.

Above Grassy Island the harbor is all flat and so studded with bare and sunken rocks as to render an intelligible description of its dangers impossible.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING STAMFORD HARBOR.

I. From the Eastward.—On the **W.** by **S.** $\frac{1}{4}$ **S.** course through the Sound, when Eaton's Neck Light-house bears **SE.** $\frac{1}{2}$ **S.**, about three miles and three-eighths distant, Great Captain's Island Light-house will bear **W.** $\frac{1}{4}$ **N.** Steer for the latter until the middle of the entrance to Stamford bears **N.** $\frac{1}{4}$ **W.**, when the woods on the western end of Greenwich Point will bear **NW.** by **W.** $\frac{3}{4}$ **W.** and you will have ten fathoms. Now steer **N.** $\frac{1}{4}$ **W.**, which will lead safely to the anchorage with not less than twelve feet at low water. Anchor in sticky bottom, with Shippan Point bearing **E SE.**, distant about three-eighths of a mile.

Sailing Directions--Stamford Harbor. The above courses pass half a mile to the westward of The Cows; one hundred and fifty yards to the westward of the extreme southwestern end of Shippan Point Shoals; a quarter of a mile to the eastward of the bare rock on the southern end of Stamford Middle Ground; six hundred yards to the westward of Shippan Point; and three hundred and fifty yards to the eastward of the bare rock near the centre of Stamford Middle Ground.

Or, on the W. by S. $\frac{1}{8}$ S. course as before, when Eaton's Neck Light-house bears S. by E. $\frac{1}{2}$ E., distant three miles and an eighth, and Norwalk Light-house N. by E. $\frac{1}{4}$ E., distant two miles and three-quarters, steer W. Northerly for Great Captain's Island Light-house until the eastern extremity of Greenwich Point bears NW. by W. $\frac{3}{4}$ W., distant two miles, and the low bluff on the eastern end of Shippan Point NE. by N. $\frac{1}{8}$ N., about the same distance. Here you will have fifteen fathoms, the harbor will be well open, and N. $\frac{1}{4}$ W. will lead to the anchorage with not less than twelve feet at low water.

The above courses pass three-quarters of a mile to the southward and half a mile to the westward of the red buoy on The Cows.

Or, coming from Huntington Bay.—When Lloyd's Point bears SW. by W. $\frac{3}{4}$ W., distant one mile and three-eighths, and Eaton's Neck Light-house E. by S. $\frac{1}{4}$ S., distant three miles, you will have eight fathoms and must steer NW. $\frac{3}{8}$ W. until the eastern extremity of Greenwich Point bears NW. by W. $\frac{3}{4}$ W., two miles, Great Captain's Island Light-house W. Northerly, four miles and a quarter, and the low bluff on the eastern side of Shippan Point NE. by N. $\frac{1}{8}$ N., two miles distant. Now steer N. $\frac{1}{4}$ W. to the anchorage, as before.

DANGERS

IN APPROACHING AND ENTERING STAMFORD HARBOR.

II. From the Westward.—Vessels from the westward usually anchor on the western side of Stamford Middle Ground; though it is not unusual for them to anchor in the Eastern Channel, between the Middle Ground and Shippan Point. In the latter case the dangers are the same as those already described on page 483; while in the former the first danger met with lies off the eastern end of

Greenwich Point Shoal. It is a dangerous ledge, covered with sunken rocks and rocks awash,—the former having from two to three feet upon them at low tides,—and extends in a SE. by E. direction over six hundred yards. *Woolsey's Rock*, which is awash at low water, lies near the eastern edge of the shoal, a quarter of a mile SE. by E. $\frac{3}{4}$ E. from Greenwich Point and nearly two miles W. $\frac{1}{4}$ S. from the red buoy on The Cows. Neither the shoal nor the rock is buoyed; and to avoid them vessels in beating should not go to the northward of Great Captain's Island Light-house bearing W. $\frac{3}{4}$ S.; and in going into the harbor should not approach the point nearer than eight hundred yards.

When past Greenwich Point look out, on the western side of the passage, for a detached six feet shoal, which lies about a quarter of a mile from the western shore and nearly five-eighths of a mile SW. $\frac{3}{8}$ S. from Peck's Point. This shoal bears W. $\frac{1}{2}$ S. from Shippan Point, distant one mile and an eighth; and, as it is not marked in any way, the only direction that can be given for avoiding it is not to go to the westward of Peck's Point bearing NE. by N. $\frac{1}{2}$ N.

About eight hundred yards E. $\frac{1}{2}$ S. from the "six feet spot," and three hundred yards NW. by W. $\frac{3}{4}$ W. from the bare rock at the southern end of the Middle Ground, lies a sunken rock, with two feet at low water, called *Saul's Rock* and sometimes *Tod's Rock*. The only rule that can be given for avoiding it is to give the bare rock on the southern end of the Middle Ground a berth to the eastward of not less than a quarter of a mile.

Nearly a quarter of a mile to the northeastward of the "six feet spot" is the southernmost of a group of rocks covering an area of about three hundred yards square. Most of them are awash at low water and a large portion of the ledge is bare at low spring tides. They are called *Hull's Rocks*, and their eastern extremity is a quarter of a mile SW. by S. $\frac{1}{2}$ S. from Peck's Point; six hundred yards N. by W. $\frac{3}{4}$ W. from *Saul's Rock*; and about nine hundred yards NW. $\frac{3}{4}$ N. from the bare rock on the southern end of the Middle Ground.

An eighth of a mile to the northward of *Hull's Rocks*, and about the same distance SW. by S. $\frac{1}{2}$ S. from Peck's Point, lies another sunken rock, called *Peck's Point Rock*. Both this rock and *Hull's Rocks* may be avoided by not going to the westward of the middle of *Grassy Island* bearing NE.

As before remarked, this harbor is not recommended to strangers except in cases of emergency.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING STAMFORD HARBOR.

II. *From the Westward.*—On the **E.** by **N.** $\frac{1}{2}$ **N.** course from off Sands' Point, when just past Matinicock Point, with Great Captain's Island Light-house bearing **N.** by **E.** $\frac{1}{4}$ **E.**, three miles and seven-eighths, and Execution Rocks Light-house **W.** by **S.** $\frac{1}{2}$ **S.**, five miles and three-eighths distant, you will have nine fathoms and must steer **NE.** towards Shippan Point. *If intending to enter through the Western Channel:* When Great Captain's Island Light-house bears **W.** **Northerly**, nearly three miles distant, steer **NE.** by **N.** $\frac{1}{2}$ **N.**, which will lead to the anchorage with not less than twelve feet water. Anchor, with Shippan Point bearing **E.** by **S.** $\frac{1}{2}$ **S.**, in from twelve to thirteen feet, soft bottom.

The above courses pass about six hundred and fifty yards to the eastward of the eastern end of Greenwich Point Shoal; three-eighths of a mile to the eastward of Woolsey's Rock; about a quarter of a mile to the westward of the bare rock on the southern end of Stamford Middle Ground; the same distance to the eastward of the "six feet shoal;" an eighth of a mile to the westward of Saul's Rock; the same distance to the eastward of the eastern end of Hull's Rocks; a quarter of a mile to the westward of the bare rock near the centre of Stamford Middle Ground; and about two hundred yards to the eastward of Peck's Point Rock.

But, if intending to enter by the Eastern Channel: Continue the **NE.** course towards Shippan Point until within eight hundred yards of it, with the eastern extremity of Greenwich Point bearing **W.** by **S.** $\frac{1}{2}$ **S.**, distant a mile and three-quarters, when steer **N.** $\frac{1}{4}$ **W.**, carrying not less than twelve feet to the anchorage. Anchor in twelve feet, sticky bottom,—Shippan Point bearing **E SE.**, distant about three-eighths of a mile.

The above courses pass half a mile to the eastward of the eastern end of Greenwich Point Shoal; eleven hundred yards to the eastward of Woolsey's Rock; four hundred and fifty yards to the eastward of the bare rock on the southern end of Stamford Middle Ground; one hundred and fifty yards to the westward of the extreme southwestern point of Shippan Point Shoals; and six hundred yards to the westward of Shippan Point.

Or, you may bring Execution Rocks Light-house to bear SW. by **W.** $\frac{3}{4}$ **W.** and steer **NE.** by **E.** $\frac{3}{4}$ **E.** until Great Captain's Island Light-house bears **NW.** by **N.**, a little over two miles distant. Here you will have nine fathoms and must steer **NE.** for Shippan Point, following the directions given above.

Or, on the E. by **N.** $\frac{1}{2}$ **N.** course from off Sands' Point, when abreast of Oak Neck, in seven and a half fathoms, with Lloyd's Point bearing **E.** $\frac{1}{4}$ **S.** and Great Captain's Island Light-house **NW.** $\frac{1}{4}$ **N.**, steer **NE.** by **N.** $\frac{1}{4}$ **N.** to enter by the Eastern Channel. On this course, when within about eight hundred yards of Shippan Point, with the eastern end of Greenwich Point bearing **W.** by **S.** $\frac{1}{2}$ **S.**, distant one mile and three-quarters, steer **N.** $\frac{1}{4}$ **W.**, as before, to the anchorage.

These courses pass seven-eighths of a mile to the eastward of Greenwich Point Shoal; three-quarters of a mile to the westward of the red buoy on The Cows; a quarter of a mile to the eastward of the bare rock on the southern end of Stamford Middle Ground; and one hundred and fifty yards to the westward of the southwestern end of Shippan Point Shoals.

Or, coming from the vicinity of Great Captain's Island Harbor, bring Great Captain's Island Light-house to bear **W.** **Northerly** and steer **E.** **Southerly** until the eastern end of Greenwich Point bears **N.** by **W.** $\frac{1}{2}$ **W.**, seven-eighths of a mile distant. Shippan Point will now bear **NE.** and that course may be steered to enter by the Eastern Channel; or **NE.** by **N.** $\frac{1}{2}$ **N.** to enter by the Western Channel.

III. *Coming from the Eastward, to make the Anchorage on the eastern side of Greenwich Neck.*—Bring Great Captain's Island Light-house to bear **W.** **Northerly** and steer for it until past The Cows, with the low bluff on the eastern side of Shippan Point bearing **NE.** by **N.** $\frac{1}{4}$ **N.** and the eastern end of Greenwich Point **NW.** by **W.** $\frac{3}{4}$ **W.** Now steer **NW.** $\frac{2}{3}$ **W.** and anchor in three fathoms about a quarter of a mile from the shore.

Or, from the vicinity of Huntington Bay.—Bring Lloyd's Point to bear **SW.** by **W.** $\frac{3}{4}$ **W.**, distant one mile and three-eighths, and Eaton's Neck Light-house **E.** by **S.** $\frac{1}{4}$ **S.**, distant three miles, and steer **NW.** $\frac{3}{4}$ **W.**, which will lead safely to the anchorage.

Or, from off Oyster Bay.—With Eaton's Neck Light-house bearing **E. by S. $\frac{1}{4}$ S.**, Lloyd's Point **SE. $\frac{1}{2}$ E.**, and Great Captain's Island Light-house **W NW.**, steer **N. by W. $\frac{3}{4}$ W.**, which will lead to a comfortable anchorage under the eastern shore of Greenwich Neck in from fifteen to seventeen feet at low water. This course passes half a mile to the eastward of Greenwich Point Shoal; five-eighths of a mile to the westward of the bare rock on the southern end of Stamford Middle Ground; half a mile to the westward of Saul's Rock; and two hundred yards to the westward of the "six feet shoal."

Or, on the NE. course for Shippan Point, when Great Captain's Island Light-house bears **W. $\frac{1}{4}$ N.**, distant two miles and three-quarters, steer **N. by E. $\frac{3}{4}$ E.** and anchor at discretion in from fourteen to seventeen feet at mean low water. This course passes about three hundred yards to the eastward of Greenwich Point Shoal; a quarter of a mile to the eastward of Woolsey's Rock; and two hundred yards to the westward of the "six feet shoal."

OYSTER BAY.

Oyster Bay lies on the southern side of the Sound and is the next harbor to the westward of Huntington Bay. It is of very irregular shape,—being divided into two parts by Centre Island, the eastern side of which forms also the western shore of the bay. The entrance lies between Lloyd's Point on the east and Centre Island Point on the west and is a little over two miles and an eighth wide; but rapidly contracts to about one mile and a quarter abreast of Northwest Bluff, which width it keeps for about one mile until you come abreast of the eastern point of Centre Island, where it divides,—one arm running to the southward between West Neck and Cove Neck, and the other to the southwestward and westward between Centre Island on the north and Cove Neck and the mainland on the south. The former is called **Cold Spring Harbor** and the latter **Oyster Bay Harbor**. Not less than six fathoms can be taken into the bay through a channel about three hundred yards wide; and good anchorage is found between West Neck and Centre Island in from three to seven fathoms at low water. From fifteen to seventeen feet is found in Cold Spring Harbor and from two to five fathoms in Oyster Bay Harbor.

Lloyd's Point, the eastern point of entrance, is, as already described on page 366, low, flat and sandy, and has a long grove of low trees a little way back from its northern end. It is the northwestern extremity of **Lloyd's Neck**.

Centre Island Point. Centre Island Point, the western point of entrance, is the northern end of Centre Island, and appears, when viewed from the northward, as a precipitous bluff nearly one hundred feet high with a group of tall straight trees on its summit. These trees are somewhat remarkable from the fact that the rest of the growth in this vicinity is low scrub and small bushes. The bluff descends gently to the westward, terminating in a narrow flat sand beach, called **Centre Island Beach**, connecting the island with Oak Neck.

From Lloyd's Point the eastern shore of the bay takes a general direction about **SW. by S. $\frac{1}{4}$ S.** for one mile and a half, and then about **SE. by S.** for three-quarters of a mile to the northern end of Lloyd's Beach, by which Lloyd's **Northwest Bluff** Neck is joined to West Neck. The land is composed of meadow backed by steep wooded hills for about one mile to the southward of Lloyd's Point, where a steep precipitous bluff, called Northwest Bluff, rises from the beach to a height of over one hundred feet. It has a grassy level summit except at the edge of the cliff, where there is a clump of scrubby trees.

From Northwest Bluff to the southward the land descends gently for about a quarter of a mile, terminating in sandy cliff from twenty to forty feet high, and connected by a narrow strip of low grassy land with West Fort, named **West Fort**, like East Fort, from the earthwork on its summit. The hill is a nearly perpendicular bluff with low scrub clinging to the face of the cliff, and a large and handsome house on its summit standing amid cleared fields. The most of the bluff is, however, covered with woods.

About six hundred yards to the southward the high lands terminate in the flat sand of **Lloyd's Beach**,—a narrow strip of sand extending to the southeastward for seven-eighths of a mile to the mouth of **Brick-yard Creek**, in Cold Spring Harbor. The beach is backed by rolling hilly country, forming the western shore of West Neck, and ranging in height from twenty to one hundred and twenty feet. The hills are for the most part cleared but show occasional clumps of trees. On the beach at the mouth of Brick-yard Creek and extending about a quarter of a mile to the southward will be seen what appears to be a small settlement, composed of low houses and sheds, with several wharves projecting out to the edge of the channel. This is **The Brick-yards**, and behind it rise steep clay bluffs, their summits fringed with a line of large trees.

From **The Brick-yards** the eastern shore has a general course nearly due **S.** for one mile and three-quarters to the head of Cold Spring Harbor, where is the village of **Cold Spring**. It presents an unbroken line of steep thickly wooded bluffs, skirted by a narrow sand beach at their base.

The western shore of Oyster Bay is formed by the northeastern end of Centre Island. This island is, in reality, a peninsula,—being joined to the mainland at its northern end by Centre Island Beach, as above mentioned. It **Centre Island** is very irregular in shape, lies nearly **NNE.** and **SSW.**, is about two miles long, hilly and undulating, but nowhere very high, and is for the most part thickly wooded. Its northeastern face, from Centre Island Point, extends in about a **SE. by S.** direction for nearly one mile and an eighth; and here the land is much lower and not so steep.

except about five-eighths of a mile below the point, where there is a low sand cliff about twenty feet high, behind which the land rises with a very gentle slope and is crowned with a line of low firs with an occasional tall oak or maple. On the southern side of this hill a strip of marsh land about three hundred and fifty yards wide separates it from another hill about eighty feet high, with gentle slopes, dotted with low fir and cedar trees, and terminating to the southward in a flat sandy point forming the eastern point of the island. With these exceptions this shore shows gently sloping cleared lands, skirted by a narrow sand beach and dotted with occasional trees. From this point to Cooper's Bluff (the western point of entrance to Cold Spring Harbor and the southern point of entrance to Oyster Bay Harbor) the distance is five-eighths of a mile with a channel four hundred yards wide between them, through which from five to eight fathoms may be taken at low water.

Cooper's Bluff is the northeastern extremity of Cove Neck and appears as a high cliff of yellow sand, thickly clothed on top and on its eastern and northern sides with low scrub.

Cove Neck is a peninsula about one mile and a quarter long and with an average width of three-quarters of a mile, which extends nearly due N. from the mainland between the harbors of Cold Spring and Oyster Bay. It is composed for the most part of a hilly and rolling country, descending rather steeply to the eastward,—the slopes being covered thickly with low scrub. On its eastern side it shows low sand cliffs, descending to a flat beach, and these extend for about one mile and a quarter to the southward of Cooper's Bluff, where lower and more nearly level land begins and extends to the head of the harbor, seven-eighths of a mile to the southeastward. **Cove Neck.**

Between Cooper's Bluff and The Brick-yards the entrance to Cold Spring Harbor is seven-eighths of a mile wide, and this width it keeps for about one mile, when it begins to contract until at the head of the harbor it is but a quarter of a mile wide.

A light-house will shortly be established as a guide to Cold Spring Harbor.

The southern shore of Centre Island, which forms the northern side of the entrance to Oyster Bay Harbor, is for the most part low and wooded, though occasional cleared fields are seen. It is comparatively bold-to and may be approached anywhere within three hundred and fifty yards with not less than five fathoms; and it terminates to the southwestward in a sandy point, behind which the land rises with a gentle slope to a height of about eighty feet. It is almost entirely cleared, but there are here and there a few low trees. This is the southeastern point of the island; and hence the northern shore of the harbor, which is also the southern side of Centre Island, runs nearly due W. for about half a mile,—being composed of gently sloping grassy lands rising to a height of about forty feet.

The southern shore of Oyster Bay Harbor is occupied for the most part by the village of **Oyster Bay**, which is beautifully situated on low, flat, grassy lands a little way back from the edge of the shore and at the base of a line of hills ranging in height from sixty to one hundred and twenty feet. The village is surrounded by orchards and beautifully cultivated lands, but has no commerce and is not connected with New York by rail.

At the southeastern end of the harbor is **The Cove**, at the head of which is the usual landing-place, known as **Cove Landing**. It is contained between the flat shores of Cove Neck on the east and **De Kay's Hill**, a grassy hill, eighty feet high, with precipitous faces, on the west. It is six hundred yards wide at its mouth and about four hundred and fifty yards long, but the channel is narrow and shallow and fit only for small boats.

At the southwestern end of Centre Island the irregularly shaped cove, in the southern part of which is situated Oyster Bay Harbor, turns abruptly to the northward with a width of about five-eighths of a mile, and then to the northeastward, spreading out into a shallow bay about seven-eighths of a mile wide at its mouth and one mile and a quarter long, which is embraced between the western shore of Centre Island on the east, Oak Neck and Centre Island Beach on the north, and Mill Neck on the west. At its northwestern end it receives the waters of a shallow creek called **Mill Neck Creek**, the entrance to which is about one hundred and fifty yards wide. Good anchorage is found in this harbor in from three to five fathoms at low water; but not more than fourteen feet can be taken into it, as there is a bar with that depth at its mouth. As before mentioned, its eastern shore is formed by Centre Island, which, viewed from this direction, shows a gently rolling country, for the most part thickly wooded, and showing occasional cleared fields, a few houses, and here and there a perpendicular sandy bluff. Its northern shore, which is formed by parts of **Oak Neck** and Centre Island Beach, is composed of low flat, grassy land backed by woods. Its western shore, which is formed by the eastern face of **Mill Neck**, shows a hilly country of moderate height, for the most part wooded, but showing occasional cleared fields. At the base of the higher land is a narrow strip of low, level, grassy land dotted with occasional houses.

DANGERS

IN APPROACHING AND ENTERING OYSTER BAY.

Coming from the eastward and intending to enter this bay navigators must give Lloyd's Point a good berth to the southward, as shoal water extends to the northward and northeastward from it for nearly half a mile. Vessels of less draught than ten feet may, however, cross this shoal in fourteen feet three hundred yards from the point; but from the northeastward it should not be approached nearer than five-eighths of a mile, as there is a dangerous **Lloyd's Point Shoal.** sunken rock with two feet at low water, called **Morris' Rock**, about half a mile due E. from the northern extremity of the point. The shoal off Lloyd's Point is called **Lloyd's Point Shoal** and is marked by a black spar-buoy (No. 15) placed in three fathoms on its northern end. To avoid it do not, when in its vicinity, stand to the southward of **Eaton's Neck Light-house** bearing E. by S.

On the western side of the entrance vessels beating into the bay must beware of Centre Island Reef, a long shoal making off to the northward from Centre Island Point for about one mile. It is thickly strewn with bare and sunken rocks and in its deeper parts has from three to seven feet upon it at low water. A black spar-buoy (No. 17) is placed about three-quarters of a mile to the northward of Centre Island Point and a quarter of a mile to the southward of the northern end of the reef,—there being seventeen feet at low water some distance outside of it. Large vessels should, therefore, give this buoy a berth to the southward of not less than half a mile. From the black spar-buoy on Lloyd's Point Shoal it bears **SW.** by **W.** $\frac{1}{2}$ **W.**, distant two miles and a half, and from Execution Rocks Light-house **E.** $\frac{3}{4}$ **N.**, distant nine miles and three-quarters. The proper position for this buoy would be in three and a quarter fathoms, with Lloyd's Point Shoal buoy bearing **E NE.** and Execution Rocks Light-house **W.** by **S.**; and such change will be recommended.

On the eastern side of the approach the shore should receive a berth of not less than a quarter of a mile to avoid the flats making off from Lloyd's Neck for about two hundred and fifty yards with six and seven feet at low water. They are not buoyed and are somewhat abrupt, so that great care is necessary to avoid them.

On the western side of the entrance the channel is very much obstructed by Centre Island Shoal, which makes off to the eastward from Centre Island for nearly a mile or to within six hundred yards of the eastern shore,—leaving an available channel only about three hundred and fifty yards wide. The shoal has from two to five feet upon it; and on its eastern end is placed a red spar-buoy (No. 2), bearing from the black buoy on Centre Island Reef **SE.** by **E.**, two miles, and from West Fort **SW.**, a quarter of a mile distant. This buoy will be visible, (when off Northwest Bluff,) bearing about **SE.**, and three-quarters of a mile off; and from its position close under the eastern shore a stranger would be apt to think it wrongly colored, but they must be careful to pass to the eastward of it.

When past Centre Island Shoal buoy, vessels bound into Cold Spring Harbor meet with no dangers,—it being only necessary to keep off the banks; but, if bound into Oyster Bay Harbor, the eastern point of Centre Island must receive a berth to the westward of not less than four hundred yards in order to avoid East Point Shoal, which makes off from that point for about three hundred yards with from one to four feet at low water. So also with the northern end of Cove Neck, off which dangerous reefs extend for a quarter of a mile and are not buoyed. Cooper's Bluff should receive a berth to the southward of about six hundred yards and Smith's Point (the northwestern point of the neck) a berth to the southward of not less than a quarter of a mile.

The southeastern shore of Centre Island must not be approached nearer than three hundred yards to avoid the flats on that side; while the southern shore of the harbor, opposite the village, must not be approached by vessels drawing more than sixteen feet nearer than eight hundred yards, as all of this shore is flat,—although affording good anchorage for small vessels in from nine to ten feet water under the western side of Cove Neck and off the mouth of The Cove.

The southern shore of Centre Island is bold-to and may be approached within one hundred and fifty yards with not less than three fathoms; while its southwestern end should receive a berth to the eastward of about two hundred and fifty yards from vessels intending to anchor between the island and Mill Neck.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING OYSTER BAY.

I. *From the Eastward.*—On the **W.** by **S.** $\frac{1}{8}$ **S.** course through the Sound, when Great Captain's Island Light-house bears **W.** by **N.** $\frac{1}{4}$ **N.**, distant five miles and a half, and the western extremity of Northwest Bluff **S.** $\frac{1}{4}$ **W.**, distant two miles and a half, you will have thirteen fathoms and **S.** by **W.** will lead, with not less than six fathoms, to abreast of the bluff. Here is good anchorage and it is not advisable to proceed farther without a pilot. But, wishing to enter the inner harbor, when you have just passed Northwest Bluff and are exactly in line between it and Centre Island Point,—the bluff bearing **E.** by **N.** $\frac{1}{2}$ **N.** and the point **W.** by **S.** $\frac{1}{2}$ **S.**,—West Fort will bear **SE.** by **E.**, about three-quarters of a mile off, and **SE.** $\frac{1}{4}$ **S.** will lead safely, with not less than four fathoms, to abreast of the red buoy on Centre Island Shoal. Pass to the eastward of this buoy, giving it a berth of about two hundred yards, and, if bound into Cold Spring Harbor, steer **S.** $\frac{1}{4}$ **E.**, and anchor at discretion in from fifteen to seventeen feet, soft bottom. But, if bound into Oyster Bay Harbor, round the buoy on Centre Island Shoal to the southward and steer **SW.** $\frac{1}{4}$ **W.**, which will lead, with not less than five fathoms, between the eastern point of Centre Island and Cove Neck. On this course, when Smith's Point bears **SE.** southerly, about four hundred yards off, and the large wharf on the south side of the

harbor S. by W. $\frac{1}{2}$ W., distant one mile and a quarter, steer SW. by S. $\frac{1}{2}$ S. for about five-eighths of a mile. You may continue this course and anchor off the village in from nine feet to three fathoms; or, wishing to anchor between Mill Neck and Centre Island, when the southeastern end of the island bears NW. $\frac{1}{2}$ W., three hundred and fifty yards off, steer W. $\frac{1}{4}$ N., carrying not less than three and a quarter fathoms and keeping about two hundred yards from the southern shore of the island. On this course, when the southwestern end of Centre Island bears NE. by E., about three hundred and fifty yards off, and Allen's Point (the northeastern extremity of Mill Neck) N. by W. $\frac{3}{4}$ W., steer for the latter, carrying not less than fourteen feet, and anchor, when over the bar, in from three to five fathoms, soft bottom.

Or, you may, when abreast of Smith's Point and the wharf in Oyster Bay bears S. by W. $\frac{1}{2}$ W., as before, steer for the wharf, and anchor in from nine to ten feet off the mouth of The Cove.

The above courses pass three-quarters of a mile to the westward of the black buoy on Lloyd's Point Shoal; one mile and a quarter to the eastward of the black buoy on Centre Island Reef; three-eighths of a mile to the westward of Northwest Bluff; one hundred and fifty yards to the westward of the flats making out from Lloyd's Neck a quarter of a mile below Northwest Bluff; two hundred yards to the eastward of the red buoy on the eastern end of Centre Island Shoal; six hundred yards to the southward of that shoal; one hundred yards to the southward of East Point Shoal; the same distance to the northward of the ledges off Smith's Point; three hundred and fifty yards to the southeastward of the southeastern point of Centre Island; two hundred yards to the southward of the southern end of the island; and three hundred and fifty yards to the westward of its southwestern end.

Or, having come through the South Channel of Long Island Sound.—On the W. $\frac{1}{4}$ N. course through this channel, when Lloyd's Point bears S. by E. $\frac{3}{8}$ E., distant a little over one mile and an eighth, and Great Captain's Island Light-house W. by N. $\frac{3}{8}$ N., distant nearly six miles, steer S. by W. $\frac{1}{2}$ W., nearly for the eastern point of Centre Island. On this course, when exactly between Centre Island Point and Northwest Bluff,—the former bearing W. by S. $\frac{1}{2}$ S. and the latter E. by N. $\frac{1}{2}$ N.,—West Fort will bear SE. by E. and the eastern edge of Cooper's Bluff S. $\frac{5}{8}$ E. Now steer SE. $\frac{1}{4}$ S., which will bring you up with the red buoy on the eastern end of Centre Island Shoal. When up with this buoy follow the directions for the harbor previously given.

The above courses pass half a mile to the westward of the black buoy on Lloyd's Point Shoal; six hundred and fifty yards to the westward of Northwest Bluff; one hundred and fifty yards to the westward of the flats making out from the eastern shore about a quarter of a mile below Northwest Bluff; and two hundred yards to the eastward of the red buoy on Centre Island Shoal.

II. *From the Westward, to enter Oyster Bay.*—On the E. by N. $\frac{1}{8}$ N. course from off Sands' Point, when Great Captain's Island Light-house bears NW. $\frac{3}{4}$ W., three miles and seven-eighths, Northwest Bluff SE. $\frac{3}{8}$ E., two miles and three-quarters, and Eaton's Neck Light-house E. $\frac{5}{8}$ S., nearly seven miles distant, you will have nine fathoms, and SE. $\frac{1}{4}$ S. will lead with not less than five fathoms as far up as Northwest Bluff, and with not less than four fathoms to abreast of the red buoy on the eastern end of Centre Island Shoal. Pass about two hundred yards to the eastward of this buoy and follow the directions for the harbor previously given.

The above course passes half a mile to the eastward of the black buoy on Centre Island Reef; three-quarters of a mile to the eastward of Centre Island Point; three-eighths of a mile to the westward of Northwest Bluff; one hundred and fifty yards to the westward of the flats to the southward of Northwest Bluff; and two hundred yards to the eastward of the red buoy on Centre Island Shoal.

Or, you may bring Execution Rocks Light-house to bear W. by S. $\frac{1}{4}$ S. and steer E. by N. $\frac{1}{4}$ N. until you come abreast of Centre Island Point, having it bearing S. by E. $\frac{1}{4}$ E., distant one mile and a half. Great Captain's Island Light-house will now bear NW. $\frac{1}{2}$ W. and Eaton's Neck Light-house will be exactly in range with Lloyd's Point. The depth will be seven and a half fathoms and the course SE. $\frac{1}{4}$ S., which will bring you up with the red buoy on the eastern end of Centre Island Shoal, as before.

The above courses pass three-quarters of a mile to the northward and half a mile to the eastward of the black buoy on Centre Island Reef.

TIDES.

Corrected Establishment	11 ^h 7 ^m
Mean Rise and Fall of tides	7.3 ft.
Mean Rise and Fall of Spring tides	9.2 ft.
Mean Rise and Fall of Neap tides	5.4 ft.
Mean duration of Rise	6 ^h 8 ^m
Mean duration of Fall	6 ^h 24 ^m
Mean duration of Stand	0 ^h 25 ^m
Rise of highest tide observed	10.4 ft.

VARIATION OF THE COMPASS.

The magnetic variation at Oyster Bay for 1880 is 8° 18' W., with an approximate annual increase of 2 1/4'.

GREENWICH COVE AND COS COB HARBOR.

On the northern side of Greenwich Neck, between it and Elias' Point, is the entrance to Greenwich Cove, a large but very shallow cove running to the north-eastward and having anchorage in from six to twelve feet at low water. Between Elias' Point on the north and Pelican Point (the northwestern end of Greenwich Neck) on the south, the entrance is six hundred yards wide; but this width is diminished by several outlying islets off Pelican Point, so as to leave an available channel of only about two hundred yards. The general direction of Greenwich Cove is NE. by E. and SW. by W. and its length about one mile, with an average width, after passing the entrance, of a little over half a mile; but it is extremely shallow, and is, moreover, occupied by several marshy and rocky islets lying nearly in the middle of the cove and leaving but a very narrow channel between them and the northern shore,—all the southern part of the harbor being bare at low spring tides.

Flat Neck Point, the western extremity of Greenwich Point, is easily recognized by the thick grove of trees upon it,—all the rest of the neck being bare. **Pelican Point**, the northwestern point of the neck, is bare of trees, somewhat undulating, and surrounded by marsh, from which a strip of sand and meadow, covered at high water, makes off to the northwestward for about two hundred and fifty yards, where there is a small sand islet

called **Pelican Island** marking the southern limits of the entrance. All this part of the shore is shoal and, between Flat Neck Point and Pelican Point, should receive a berth of not less than four hundred and fifty yards to the eastward to avoid the flats.

Elias' Point, the northern point of entrance to the cove, is a narrow strip of sand backed by marsh, and this again by cleared fields and occasional clumps of woods. In the background a number of very prominent white houses will appear, forming part of the village of **Greenwich**. The most remarkable of these is the **Americus Club House**, a very tall building with mansard roof and two towers.

The shores of Greenwich Cove are composed entirely of marsh, faced by a sand beach covered at high water, and backed by nearly level land, finely cultivated and well settled. The northern shores are backed by somewhat higher ground than that on the eastern side,—the hills in some places showing steep slopes to the southward,—and there are occasional groves of trees.

In the middle of the harbor is a group of three islets,—one of which is rocky and surrounded by marsh and is known as **Greenwich Island**; while the others are mere strips of marsh and are covered at extreme high tides. **Greenwich Island** lies about nine hundred yards to the eastward of Elias' Point and the same distance from Pelican Island,—bearing E. 1/4 N. from the former and NE. 3/4 E. from the latter. The fast land, which is of moderate height and bare of trees, is about one hundred and fifty yards long NNE. and SSW.; but a sand spit extends to the northward from it about sixty yards, and marsh to the southward about one hundred and seventy-five yards, making the whole length of the island about three hundred yards. A marshy islet about two hundred and fifty yards long N.

Greenwich Island. by E. and S. by W. lies about one hundred yards to the southwestward of Greenwich Island; and another, a little less than one hundred yards in diameter, lies on the eastern side of the island close to its southern end. These islets are surrounded by flats,—the whole of the cove between them and the eastern shore having only from one to three feet at low water; but they serve as excellent channel marks, as they lie on the northern edge of the flats,—the channel passing to the northward of them.

A quarter of a mile to the westward of Elias' Point is **Todd's Point**, the eastern point of entrance to Cos Cob Harbor, or **Mianus River** as it is sometimes called. This river is a very shallow arm of the Sound, running in a NNE. direction for one mile and three-quarters to the village of Mianus. At its mouth, between Todd's Point on the east and

Mianus River. Quarry Ball Island on the west, it is nearly half a mile wide, but rapidly diminishes until at Mianus it is a mere brook. The river affords anchorage for small vessels in from seven to fifteen feet at low water; but not more than two feet can be taken up to Studwell's Point, seven-eighths of a mile above the mouth, and not even small boats can reach Cos Cob or Mianus at extreme low tide.

Todd's Point, the eastern point of the entrance to the river, is a rocky hillock with steep faces to the southward, and is connected with the mainland by a strip of sand and marsh. It is partly wooded, as is also the point of land two hundred yards to the northward of it; but the country to the northward and northeastward of it is almost entirely under cultivation and nearly level.

Quarry Ball Island, the western point of entrance, is in reality a part of the mainland, though separated from the firm ground to the northward by marsh. It is a flat grassy point, with thick woods appearing behind it to the northward, and is surrounded by shoals, so that it is not safe to approach it nearer than two hundred yards.

Both banks of the Mianus River are fringed with marsh which is covered at high water, at which times the river appears to flow among cultivated fields,—the land being nearly level, well settled, and for the most part bare of trees. The exception to this description is on the western bank, seven-eighths of a mile above the mouth, where a steep thinly wooded bluff projects into the river and is known as Studwell's Point. On the western side of this bluff makes in a **Studwell's Point** cove, bare at half tide, and called **Studwell's Cove**; while on its eastern side is **Cos Cob Creek**, also bare at half tide, on the western bank of which is situated the settlement of **Cos Cob**. About five-eighths of a mile above Cos Cob is the village of **Mianus**, occupying both banks of the stream, which is here but little over fifty yards wide and is barred by a bridge or causeway which effectually closes it to navigation.

In the mouth of the river lie three rocky islets in a line nearly due **N.** and **S.** The southernmost, called **Bluff Island**, is about one hundred and fifty yards long **NW.** and **SE.**; and at its centre is higher and steeper than any of the others, whence its name. A ledge of rocks, bare at half tide, lies about eighty yards to the westward of the **Bluff Island**. and is known as **Bluff Island Ledge**. The centre of **Bluff Island** is about a quarter of a mile to the westward of **Todd's Point** and about the same distance **SE. $\frac{1}{4}$ S.** from **Quarry Ball Island**; but there is no passage between it and **Todd's Point**,—the channel passing on its western side.

A little over two hundred yards to the northward of **Bluff Island** lies **Rocky Island**, which is merely a bare ledge, very irregular in shape, about one hundred and twenty yards long in a **NW.** and **SE.** direction. It is exactly in the middle of the river,—being about four hundred and fifty yards from either shore,—and the channel passes close along its western side with from seven to nine feet at low water.

Three hundred yards to the northward of **Rocky Island** and one hundred and fifty yards from the western bank of the river lies **Goose Island**, a flat rocky islet, with its surface covered with grass, and about one hundred yards long **NW.** and **SE.** At low water it is joined to the mainland by a strip of sand on which there are many small detached rocks.

It may also be remarked that off **Quarry Ball Island** there are a number of rocks bare at low water,—the outermost of which is one hundred and fifty yards from shore and renders a near approach dangerous.

DANGERS

IN APPROACHING AND ENTERING GREENWICH COVE.

I. From the Eastward.—The entrance to this anchorage from the eastward is between **Flat Neck Point** on the east and **Little Captain's Island** on the west and is nearly one mile and a quarter wide. **Little Captain's Island**, as before described on page 371, is in reality two very small islands joined at low water by a strip of sand beach strewn with boulders. From the easternmost islet, which is the smallest, extends a long and very dangerous reef, called **Little Captain's Island East Reef**, which has many bare rocks and rocks awash upon it and is marked by a **Little Captain's Island East Reef** buoy. This reef lies nearly **NE.** and **SW.** and is about five-eighths of a mile long, with depths, where it is not bare, of from two to six feet at low water. Seven hundred yards **E.** by **N. $\frac{1}{2}$ N.** from the island is a rock awash, and close to it another with two feet at low water; and about one hundred and fifty yards to the eastward of this is placed a black spar-buoy (No. 1) in twelve feet water,—**Great Captain's Island Light-house** bearing **W SW.**, distant nearly one mile and a quarter; and **Flat Neck Point NE.** by **E. $\frac{1}{2}$ E.**, distant nearly seven-eighths of a mile. From this buoy the middle of the entrance to **Cos Cob Harbor** bears about **N.** by **E.**, and **Elias' Point NE. $\frac{1}{2}$ N.**, one mile and a quarter distant.

On the eastern side of the entrance look out for **Flat Neck Point Shoal**, which makes off from **Flat Neck Point** to the westward for more than a quarter of a mile with less than six feet at low water. There are many bare rocks and rocks awash at low water scattered **Flat Neck Point Shoal**. A red spar-buoy (No. 2) is placed in fifteen feet about two hundred yards to the westward of the shoal,—**Great Captain's Island Light-house** bearing **SW.** by **W. $\frac{1}{2}$ W.**, **Flat Neck Point E.** by **N. Northerly**, three-eighths of a mile, and **Bluff Island** (at the entrance to **Cos Cob Harbor**) **N.** by **W. $\frac{1}{4}$ W.**, nearly one mile distant.

It must also be remarked that the southern shore of **Greenwich Neck** from **Greenwich Point** to **Flat Neck Point** is very shoal and must receive a berth to the northward of not less than half a mile.

If standing to the westward on a wind beware of a very dangerous sunken rock called **Cove Rock**, which lies about nine hundred yards **SW. $\frac{3}{4}$ W.** from **Todd's Point** and about six hundred yards **S.** by **W.** from **Bluff Island**. To avoid it when bound into **Greenwich Cove** do not stand to the northward of **Elias' Point** bearing **NE.** by **E. $\frac{3}{4}$ E.**, or to the westward of **Great Captain's Island Light-house** bearing **SW. $\frac{1}{2}$ W.** A buoy should be placed upon this rock, as it is directly in the way of vessels bound into **Cos Cob Harbor** from the eastward.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING GREENWICH COVE.

I. From the Eastward.—**1. On the W.** by **S. $\frac{1}{2}$ S.** course through the Sound, when **Great Captain's Island Light-house** bears **W NW.**, four miles and three-quarters, **Eaton's Neck Light-house E.**

Sailing Directions--Greenwich Cove. by **S. $\frac{1}{4}$ S.**, five miles and three-quarters, and the woods on Flat Neck Point **NW. $\frac{1}{4}$ N.**, three miles and five-eighths distant, you will have ten fathoms and **NW. $\frac{1}{2}$ W.** will lead safely between Flat Neck Point Shoal and Little Captain's Island East Reef. On this course, when Great Captain's Island Light-house bears **WSW.** and you are nearly abreast of the black buoy on the East Reef, Elias' Point will bear **N.** by **E. $\frac{3}{8}$ E.**, and you must steer that course for about half a mile until you bring the southern end of Horse Neck Point to bear **W. $\frac{1}{4}$ N.** and Pelican Island **NE.** by **E. $\frac{1}{8}$ E.**,—the latter being distant about nine hundred yards. Great Captain's Island Light-house will now bear **SW. $\frac{3}{4}$ W.** **Westerly**, and **NE. $\frac{3}{4}$ E.** **Easterly** will lead safely to the anchorage. Or, you may anchor on the **NW. $\frac{1}{2}$ W.** course in from three to five fathoms,—Great Captain's Island Light-house bearing **SW.** by **W.**

The above courses pass three-eighths of a mile to the southward of the shoal ground south of Greenwich Neck; about six hundred yards to the eastward of the black buoy on Little Captain's Island East Reef; two hundred yards to the westward of the red buoy on Flat Neck Point Shoal; a quarter of a mile to the eastward of Cove Rock; six hundred yards to the southward of Elias' Point; and one hundred yards to the northward of Pelican Island.

Or, you may bring Great Captain's Island Light-house to bear W. Northerly and steer for it until the eastern extremity of Greenwich Point bears **NE.** by **N. $\frac{3}{4}$ N.**, distant nearly one mile, where you will have twelve fathoms and must steer **NW. $\frac{1}{2}$ W.**, as before, following the directions given above for the harbor.

Or, you may bring Great Captain's Island Light-house to bear W. $\frac{3}{4}$ N. and steer for it until the western edge of the woods on Flat Neck Point bears **NW.** by **N. $\frac{1}{2}$ N.**, distant nearly one mile and a half; when steer **NW. $\frac{1}{2}$ W.**, as before, and follow the directions for the harbor.

2. From the Westward, outside Great and Little Captain's Islands.—In approaching Greenwich Cove by this passage there are no dangers, except the shoal water surrounding Great and Little Captain's islands, until you come up with Little Captain's Island East Reef at the entrance. It is only necessary to keep about a quarter of a mile from Great and Little Captain's islands until you come up with the buoy on this reef; beyond which the dangers are the same as those described in the approaches from the eastward. A good rule in coming in from the Sound is to bring the southern end of the woods on Flat Neck Point to bear **NE. $\frac{1}{2}$ E.**, distant about four miles, and Great Captain's Island Light-house **NE. $\frac{3}{4}$ N.**, distant two miles and a quarter, and steer **NE. $\frac{1}{2}$ E.** for the woods until within seven-eighths of a mile of them, with Great Captain's Island Light-house bearing **W.** by **S. $\frac{1}{4}$ S.**, one mile and a quarter distant. You will now be about abreast of the black buoy on Little Captain's Island East Reef and may steer either **N.** by **E. $\frac{3}{8}$ E.** for Elias' Point, carrying not less than seventeen feet, or **NE.** by **N. $\frac{1}{2}$ N.**, carrying not less than fourteen feet. On either of these courses, when Great Captain's Island Light-house bears **SW. $\frac{3}{4}$ W.** **Westerly**, steer **NE. $\frac{3}{4}$ E.** **Easterly** into the cove and anchor in from nine to twelve feet about three hundred yards to the northeastward of Pelican Island.

DANGERS

IN APPROACHING AND ENTERING GREENWICH COVE.

II. From the Westward, inside Great and Little Captain's Islands.—This passage, though not fit for strangers, is very commonly used by vessels of light draught either when making an anchorage in Great Captain's Island Harbor or wishing to enter Greenwich Cove or Mianus River. Twelve feet at low water can be taken through it, with the aid of a pilot, as far as abreast of Cove Rock; but as very few of the shoals are buoyed strangers must not attempt to pass through. The passage on the *outside* of Great and Little Captain's islands is much safer and quite as direct and should always be used by those unacquainted with the locality.

To enter the *inside* passage you first pass between Great Captain's Island on the east and Manursing Island on the west. On approaching this latter island look out for **Glover's Reef.** Glover's Reef, which lies off the southern end of that island at a distance of five hundred yards, is awash in some places at low water, and is not buoyed. Vessels must, therefore, give the southeastern end of the island a berth to the westward of about half a mile. About three-quarters of a mile **E. $\frac{1}{4}$ N.** from the southeastern end of Manursing Island and a little over one mile and a quarter **SW.** by **W. $\frac{3}{4}$ W.** from Great Captain's Island Light-house will be seen a black spar-buoy. This is on **Blue-fish Reef Shoal**, a small detached shoal, with fifteen feet at low water, which lies about three-eighths of a mile **SE.** by **S. $\frac{1}{4}$ S.** from the southern end of Blue-fish Reef and between eleven and twelve hundred yards from

the nearest point of Manursing Island. From this buoy the southern end of Calf Island bears **NE.** by **N.** $\frac{3}{4}$ **N.**, one mile and an eighth; the red buoy on Cornel Reefs **NE.** $\frac{1}{4}$ **N.**, one mile and three-eighths; and the bluff at the western end of Great Captain's Island **NE.** by **E.** $\frac{1}{4}$ **E.**, a little over one mile distant.

Blue-fish Reef is a projection to the southeastward from the line of the shoals making off from the eastern side of Manursing Island, near its northern end. It is awash at low water and extends nearly two hundred and fifty yards from shore. There is less than **Blue-fish Reef.** eighteen feet for six hundred and fifty yards to the southeastward of the reef, and it is better for vessels not to pass to the westward of the buoy on Blue-fish Reef Shoal.

A little over half a mile to the northeastward of the buoy on Blue-fish Reef Shoal is a very dangerous ledge, nearly in the middle of the passage, and known as Four Feet Rock from the depth of water upon it. It is marked by a spar-buoy, painted red and black in horizontal stripes, placed off its southern side. The shoal of this rock bears from the black buoy **Four Feet Rock.** on Blue-fish Reef Shoal **NE.** by **N.**, a little over half a mile; from the red buoy on Great Captain's Island West Reef **W.** by **N.** $\frac{3}{4}$ **N.**, eight hundred yards; and from Great Captain's Island Light-house **W.** $\frac{1}{4}$ **S.**, nearly seven-eighths of a mile distant. From this rock the easternmost bluff on Calf Island bears **NNE.**, three-quarters of a mile, and the red buoy on Cornel Reefs **NE.** $\frac{1}{4}$ **E.**, a little over three-quarters of a mile distant.

On the eastern side of the entrance you must look out for Great Captain's Island West Reef, extending from the western end of that island about four hundred and fifty yards **W.** by **S.** $\frac{1}{2}$ **S.** with less than twelve feet at low water. The reef is dry for one hundred yards from the island, has less than six feet two hundred yards off, and eight feet at low water is found at a distance of three hundred yards from shore. A red spar-buoy (No. 2) is placed in eighteen feet **Great Captain's Island West Reef.** off the western end of this reef and bears from the light-house **W.** by **S.** $\frac{1}{2}$ **S.** about half a mile, and from the black buoy on Blue-fish Reef Shoal **NE.** by **E.** $\frac{1}{2}$ **E.**, three-quarters of a mile distant. From this buoy Four Feet Rock bears **W.** by **N.** $\frac{3}{4}$ **N.**, eight hundred yards; the southern end of Calf Island **N.** by **W.** $\frac{1}{2}$ **W.**, about fourteen hundred yards; and Cornel Reefs buoy **N.** by **E.** $\frac{3}{4}$ **E.**, nearly three-quarters of a mile distant. The sailing-line passes between this buoy and Four Feet Rock in from sixteen to eighteen feet at low water.

Vessels drawing over ten feet must, when past this buoy, give Great Captain's Island a wide berth to the southward to avoid *the dangerous rocks lying off its northern shore*; and Calf Island must also receive a berth to the northward on account of *the dangerous reefs making off from its southern end*. Thus the channel is contracted to a width of but little over two hundred yards between the lines of two fathoms, and great care is necessary in navigating this part of the passage. Of the shoals on the northern side of Great Captain's Island the most prominent are the Cornel Reefs, two **Cornel Reefs.** very dangerous ledges,—the northernmost of which is in some places bare and in others has from two to five feet at low water; while the southern ledge is entirely bare at three-quarters ebb. This southern ledge is about a quarter of a mile to the northward of Great Captain's Island, lies about **NE.** $\frac{1}{2}$ **N.** and **SW.** $\frac{1}{2}$ **S.** and is three hundred yards long. A passage nearly two hundred yards wide, with ten feet at low water, leads between this inner shoal and Great Captain's Island; but it is not recommended. A little over one hundred yards to the northward of the southernmost reef lies the outer reef, which extends about **N.** by **W.** $\frac{1}{2}$ **W.** for three hundred yards, terminating at the southeastern edge of the channel. Near its southern end it is bare at low water; but the rest of the reef has from two to five feet. At its northwestern extremity, in eighteen feet at low water, is placed a red spar-buoy (No. 4),—bearing from Great Captain's Island Light-house **NW.** by **N.** $\frac{3}{4}$ **N.**, about twelve hundred yards; from the red buoy on Great Captain's Island West Reef **N.** by **E.** $\frac{3}{4}$ **E.**, nearly three-quarters of a mile; and from the black buoy on Blue-fish Reef Shoal **NE.** $\frac{1}{4}$ **N.**, a mile and three-eighths distant. From this buoy the eastern end of Horse Neck Point bears **NE.** by **N.** $\frac{5}{8}$ **N.**, seven-eighths of a mile; Elias' Point **ENE.** Northerly, a little over two miles and a quarter; and the middle of Pelican Island **E.** by **N.** $\frac{5}{8}$ **N.**, two miles and a quarter distant.

Calf Island Reef lies on the western side of the channel, about three-eighths of a mile to the southward of the Cornel Reefs. It makes in a **S.** by **E.** $\frac{1}{2}$ **E.** direction from the southern shore of Calf Island,—its southern extremity being a quarter of a mile from the southern end of that island. It has many sunken rocks and rocks awash at low water scattered **Calf Island Reef.** over its surface; and great care is necessary to avoid it, as it is not buoyed. About an eighth of a mile **NE.** $\frac{1}{2}$ **E.** from its southern end lies a group of bare rocks known as *Jones' Rocks*, from which shoal water extends to the northwestward for an eighth of a mile with from two to six feet at low water. Jones' Rocks are out at half tide and are, therefore, easily avoided; but to avoid Calf Island Reef vessels should not go to the westward of the southeastern point of Manursing Island bearing **SW.** $\frac{1}{4}$ **S.** This bearing also avoids Jones' Rocks.

When up with the red buoy on Cornel Reefs the course turns more to the east- **Tweed's or Finch's Island Rocks.** ward, leading about midway between Elias' Point and Pelican Island. On this course, when abreast of Horse Neck Point there will be seen well to the northward of the course, bearing about **NE.**, and three-quarters of a mile off, a group of rocks bare at half tide. These are *Tweed's or Finch's Island Rocks*, and, with the shoal water surrounding them,

cover an area nearly two hundred yards in diameter. The bare rocks lie a little over four hundred yards **SE. $\frac{3}{8}$ S.** from the middle of Tweed's Island, (with a seven feet channel between them;) **E. by N.** from Horse Neck Point, three-quarters of a mile distant; and **NE. $\frac{5}{8}$ E.** from the red buoy on the Cormel Reefs, a mile and a quarter distant. The sailing-line passes well to the southward of them.

When to the eastward of Tweed's Island Rocks look out for the dangerous Cove Rock which lies about eleven hundred yards to the eastward of them and is not buoyed. The exact locality of this

rock is not known; but its approximate position is eleven hundred yards **E. $\frac{3}{4}$ S.** from **Cove Rock.** Tweed's Island Rocks; six hundred yards **S. by W. $\frac{3}{8}$ W.** from the middle of Bluff Island; one mile and a quarter **E. $\frac{1}{4}$ N.** from Horse Neck Point; and nearly one mile **NE. by N. $\frac{1}{4}$ N.** from the northeastern end of Little Captain's Island. To avoid it you should not go to the northward of Elias' Point bearing **NE. by E. $\frac{3}{4}$ E.** until the middle of Bluff Island bears **N. $\frac{1}{4}$ E.**, when you will be to the eastward of the rock.

Cove Rock should be buoyed, and such action will be recommended. When past it the dangers are the same as those described in the approaches from the eastward. (See page 491.)

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING GREENWICH COVE.

II. From the Westward, inside Great and Little Captain's Islands.—Bring Execution Rocks Light-house to bear **SW. by W.** and steer **NE. by E.** until Sands' Point Light-house bears **SW. $\frac{1}{4}$ S.** Great Captain's Island Light-house **NE. Northerly**, and the southeastern end of Manursing Island **NE. by N. $\frac{3}{4}$ N.** Here you will have eight and a half fathoms and **NE. $\frac{3}{4}$ N.** will lead safely into the passage, with Horse Neck Point a little to the northward of the course. When just past the red buoy on the Cormel Reefs and Great Captain's Island Light-house bears **SE. by S. $\frac{3}{4}$ S.**, distant five-eighths of a mile, and Elias' Point **E NE.**, distant two miles and a quarter, you will have three and a half fathoms and **E. by N. $\frac{3}{4}$ N.** will lead safely to the entrance to Greenwich Cove; after which the directions given on page 492 must be followed.

The above courses pass nearly six hundred yards to the eastward of Glover's Reef; one hundred and fifty yards to the eastward of the black buoy on Blue-fish Reef Shoal; a little over two hundred yards to the eastward of Four Feet Rock; a quarter of a mile to the westward of the red buoy on Great Captain's Island West Reef; two hundred yards to the eastward of the southern end of Calf Island Reef; one hundred and fifty yards to the eastward of Jones' Rocks; seventy-five yards to the westward, and nearly one hundred yards to the northward, of the red buoy on Cormel Reefs; nearly three-eighths of a mile to the southward of Tweed's Island Rocks; nearly seven hundred yards to the northward of the northeastern end of Little Captain's Island East Reef; and nearly two hundred yards to the southward of Cove Rock. The least water taken to the entrance to the cove, on the above courses, is ten feet at low spring tides.

On the above courses, to enter Mianus River.—On the **E. by N. $\frac{3}{4}$ N.** course for the entrance to Greenwich Cove, when Great Captain's Island Light-house bears **SW. $\frac{3}{4}$ S.**, distant nearly one mile and an eighth, and Horse Neck Point **W. by N. $\frac{3}{4}$ N.**, distant three-quarters of a mile, the middle of Bluff Island will bear **NE. $\frac{1}{4}$ E.** and **NE. $\frac{1}{2}$ N.** will lead, with not less than eight feet, into the mouth of the river.

The above course passes four hundred yards to the eastward of Tweed's Island Rocks; between five and six hundred yards to the westward of Cove Rock; a little over one hundred yards to the westward of Bluff Island Ledge; and about seventy-five yards to the westward of Rocky Island.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING MIANUS RIVER OR COS COB HARBOR.

I. From the Eastward.—In approaching this harbor from the eastward the directions for Greenwich Cove must be followed until you are fairly between Flat Neck Point and Little Captain's Island. Thus, you must bring Eaton's Neck Light-house to bear **E. by S. $\frac{1}{4}$ S.**, Great Captain's Island Light-house **W NW.**, and the woods on Flat Neck Point **NW. $\frac{1}{4}$ N.**, and steer **NW. $\frac{1}{2}$ W.** until Great Captain's Island Light-house bears **W SW.** and Elias' Point **N. by E. $\frac{1}{4}$ E.**, when steer **N. by W. $\frac{1}{2}$ W.**, carrying not less than eleven feet, until you come abreast of Bluff Island, having it bearing **E. by N. $\frac{1}{2}$ N.**, a quarter of a mile distant. Now steer **NE. $\frac{1}{2}$ N.** into the river and anchor abreast of Goose Island in from thirteen to sixteen feet.

The above courses pass about a quarter of a mile to the eastward of the black spar-buoy on Little Captain's Island East Reef; the same distance to the westward of the red buoy on Flat Neck Point Shoal; nearly two hundred yards to the westward of Cove Rock; eight hundred yards to the eastward of Tweed's Island Rocks; one hundred and fifty yards to the westward of Bluff Island Ledge; a little over one hundred yards to the westward of Rocky Island; and seventy-five yards to the southeastward of Goose Island.

II. *From the Westward, outside Great and Little Captain's Islands.*—Bring Great Captain's Island Light-house to bear **NE. $\frac{3}{4}$ N.**, distant two miles and a quarter, and the woods on Flat Neck Point **NE. $\frac{1}{2}$ E.**, distant four miles and a quarter, and steer for the latter until within about seven-eighths of a mile of the point, with Great Captain's Island Light-house bearing **W. by S. $\frac{1}{4}$ S.**, distant one mile and a quarter. Now steer **N. $\frac{1}{2}$ W.**, which course will lead with not less than ten feet to the entrance to the river, passing close alongside of the black buoy on Little Captain's Island East Reef. On this course, when abreast of Bluff Island, in eleven feet,—the centre of the island bearing **E. by N. $\frac{1}{2}$ N.**, a quarter of a mile off,—steer **NE. $\frac{1}{2}$ N.** into the river, as before.

The above courses pass half a mile to the southward of Great Captain's Island Light-house; about three-eighths of a mile to the southward of Little Captain's Island; one hundred yards to the southward and about the same distance to the eastward of the black buoy on Little Captain's Island East Reef; three-eighths of a mile to the westward of the red buoy on Flat Neck Point Shoal; three hundred yards to the westward of Cove Rock; and one hundred and fifty yards to the westward of Bluff Island Ledge.

LITTLE CAPTAIN'S ISLAND HARBOR.

This convenient anchorage lies on the northern side of Little Captain's Island and is good for from ten feet to four fathoms, affording shelter from all winds. It is entered by the passage previously described, leading from the eastward into Greenwich Cove and Mianus River, and is easily accessible to strangers by following the sailing directions.

Little Captain's Island is in reality two small islets joined at low water by a sand beach strewn with boulders. The easternmost islet is about seventy-five yards long, with nearly level grassy surface and perpendicular faces to the southeastward. The western islet, which is about two hundred yards to the southwestward of the former, is a mere ridge of sand about two hundred and seventy-five yards long. They rise from the middle of a large shoal strewn with bare and sunken rocks, and extending to the northeastward from the easternmost islet for eight hundred yards and to the southwestward from the westernmost islet between six and seven hundred yards. The eastern portion of the shoal is called **Little Captain's Island East Reef**, (see page 491,) and the western portion **Little Captain's Island West Reef**.

**Little Captain's
Island.**

There is no safe passage between this island and Great Captain's Island, which lies about twelve hundred yards to the southwestward.

Flat Neck Point, the eastern point of entrance to this anchorage, has been already described in the approaches to Greenwich Cove from the eastward. It is the western extremity of **Greenwich Neck** and is easily recognized by its thick clump of woods,—the rest of the neck being destitute of trees. A dangerous shoal makes off from **Flat Neck Point**. It extends to the westward for between six and seven hundred yards, having many bare and sunken rocks upon it. It is called **Flat Neck Point Shoal**, and is marked by a red spar-buoy (No. 2) placed in fifteen feet off its western end.

Little Captain's Island East Reef, mentioned above, is marked by a black spar-buoy (No. 1) placed in eighteen feet near a two feet rock on the eastern extremity of the reef. The channel between this buoy and that on Flat Neck Point Shoal is half a mile wide with from three to six fathoms in it.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING LITTLE CAPTAIN'S ISLAND HARBOR.

On the **W. by S. $\frac{1}{8}$ S.** course through the Sound, when Great Captain's Island Light-house bears **W NW.**, Eaton's Neck Light-house **E. by S. $\frac{1}{4}$ S.**, and the woods on Flat Neck Point **NW. $\frac{1}{4}$ N.**, steer **NW. $\frac{1}{2}$ W.**, which course will lead about midway between the two buoys at the entrance. You may anchor on this course in five fathoms as soon as Great Captain's Island Light-house bears **SW. $\frac{1}{2}$ W.**; or, from this bearing you may steer **W. by S.** and anchor in from three to four fathoms, with the light-house bearing **SW. $\frac{1}{4}$ S.**

The above courses pass a quarter of a mile to the eastward of the black buoy on Little Captain's Island East Reef; the same distance to the westward of the red buoy on Flat Neck Point Shoal; and an eighth of a mile to the northward of the northeastern end of Little Captain's Island East Reef.

The **NW. $\frac{1}{2}$ W.** course continued will lead to the entrance to **Bush's Harbor**, passing an eighth of a mile to the westward of Tweed's Island Rocks.

GREAT CAPTAIN'S ISLAND HARBOR.

This anchorage lies on the northern side of Great Captain's Island, between it and the southernmost and largest of the two Calf Islands. Great Captain's Island is about seven hundred yards long **E. and W.** and is easily recognized by the light-house on its eastern end. It is formed by two grassy hills five-eighths of a mile apart and united by a narrow strip of sand. The eastern hill, on which the light-house is built, is the highest,—being about thirty feet above sea-level,—and shows precipitous faces to the southward. The western hill, which is lower, rises with a very gentle slope from **E. to W.** and terminates in a low cliff on its western side. The light-house is a grey dwelling, surmounted by a white lantern, and is perched upon a dark-looking hill with perpendicular faces of a yellowish-white color. The light is fixed white, of the fourth order, is shown from a height of seventy-four feet above the sea, and is visible fourteen miles. Its geographical position is

Latitude ----- 40° 58' 55" N.
Longitude ----- 73° 37' 26" W.,

and it bears from

	Miles.
Norwalk Light-house, W. by S. $\frac{3}{4}$ S. ----- a little over	10
Middle Ground Light-house, W. $\frac{1}{4}$ S. Southerly -----	24
Old Field Point Light-house, W. $\frac{3}{4}$ N. -----	22 $\frac{1}{2}$
Eaton's Neck Light-house, W. by N. $\frac{3}{4}$ N. -----	10 $\frac{1}{2}$

From this light-house Sands' Point Light-house bears **SW. $\frac{1}{4}$ S.** Nearly, eight miles and three-eighths; Throg's Neck Light-house **SW.**, nearly thirteen miles; and Execution Rocks Light-house **SW. $\frac{1}{4}$ W.**, a little over eight miles distant. There is no fog-signal at this light-house.

Great Captain's Island is surrounded by shoals and must not be closely approached. The long reef which connects it with Little Captain's Island to the eastward is called **Great Captain's Island East Reef**, and has several bare rocks and rocks awash upon it. There is no safe passage between the islands. The reef which extends to the westward, and which obstructs the approach to the harbor, is called **Great Captain's Island West Reef**, and has been already described in the approaches to Greenwich Cove and Mianus River on page 493. It extends in a **W. by S. $\frac{1}{4}$ S.** direction from the western end of the island between four and five hundred yards with less than twelve feet at low water, and has less than six feet an eighth of a mile from the island. A red spar-buoy (No. 2) is placed on its western end,—the light-house bearing **E. by N. $\frac{1}{4}$ N.**, distant half a mile, and the buoy on Blue-fish Reef Shoal **SW. by W. $\frac{3}{4}$ W.**, distant about three-quarters of a mile. The sailing-line passes between this buoy and **Four Feet Rock**, already described on page 493.

The Calf Islands, or **The Calves** as they are sometimes called, lie on the northern side of the harbor,—the distance between their southern end and Great Captain's Island being about thirteen hundred yards. They consist of two islands **NNW.** and **SSE.** from each other, and joined at low water by a narrow ridge of sand and salt-meadow. The southernmost, which is the largest, is composed of two grassy hillocks lying **NE.** and **SW.** from each other and joined by a narrow sand beach.

Calf Islands. The easternmost hillock is about twenty feet high, nearly round, and shows perpendicular faces to the southward. The western hillock lies **NNW.** and **SSE.**, has a gently sloping grassy surface, and a low cliff-like face about ten feet high on its southern side. The northern islet is only about two hundred and fifty yards long **NE.** and **SW.**, is bare of trees and has a very gentle rise to its summit, which is not more than ten feet high. It is about two hundred yards to the northward of the southern island.

Calf Island Reef, already described on page 493, extends from the southern shore of Calf Island **S. by E. $\frac{1}{4}$ E.** for a quarter of a mile and has many rocks upon it bare at low water. An eighth of a mile **NE. $\frac{1}{4}$ E.** from its southern end lies a group of half-tide rocks, known as **Jones' Rocks**, from which a ledge with from two to six feet at low water extends to the northward for about two hundred and fifty yards. These rocks being out at half tide are easily avoided; but, to avoid Calf Island Reef vessels must not go to the westward of the southeastern end of Manursing Island bearing **SW. $\frac{1}{4}$ S.**

The eastern boundary of the anchorage in Great Captain's Island Harbor is formed by the dangerous **Cormel Reefs**, (already described on page 493,) which are marked by a red spar-buoy (No. 4) placed on their northwestern end in three fathoms water. Vessels using this anchorage do not, however, approach this reef, but anchor about three hundred and fifty yards to the south-westward of the buoy.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING GREAT CAPTAIN'S ISLAND HARBOR.

I. From the Eastward.—On the **W. by S. $\frac{1}{4}$ S.** course, when abreast of Centre Island Point, in nine fathoms, with Great Captain's Island Light-house bearing **NW. $\frac{1}{4}$ W.**, nearly four miles distant, and Flat Neck Point **N. by W. $\frac{1}{4}$ W.**, three miles and five-eighths distant, steer **NW. by W. $\frac{1}{4}$ W.**, which course continue until Great Captain's Island Light-house bears **NE. $\frac{3}{4}$ E.**, distant three-quarters of a mile. Now steer **N. by W. $\frac{3}{4}$ W.** and anchor under the western side of the southern Calf Island in eleven feet, soft bottom; or, when past the red buoy on Great Captain's Island West Reef and the light-house bears **E. $\frac{3}{4}$ N.**, about three-quarters of a mile off, steer **NE. $\frac{1}{4}$ N.**, carrying not less than sixteen feet, and anchor in seventeen feet with the light-house bearing **SE. by E. $\frac{1}{4}$ E.**

If bound into Byram River you may continue the NW. by W. $\frac{3}{4}$ W. course until within a quarter of a mile of Manursing Island, where you must anchor and take a pilot.

The above courses pass five-eighths of a mile to the eastward of the black spar-buoy on Blue-fish Reef Shoal; three hundred yards to the westward of the red spar-buoy on Great Captain's Island West Reef; three hundred and fifty yards to the eastward of Four Feet Rock; and about two hundred yards to the southward of the southern end of Calf Island Reef.

Or, having come along shore from the Eastward, you may, when off Flat Neck Point, bring the southern end of Manursing Island to bear W. by S. $\frac{1}{4}$ S. and steer for it until Great Captain's Island Light-house bears NE. $\frac{3}{4}$ E., three-quarters of a mile off; when steer N. by W. $\frac{3}{4}$ W. and proceed as before directed.

II. From the Westward.—Bring Execution Rocks Light-house to bear SW. by W. and steer NE. by E. until Great Captain's Island Light-house bears NE. Northerly and the southeastern end of Manursing Island NE. by N. $\frac{3}{4}$ N. Here you will have eight and a half fathoms, and NE. $\frac{3}{4}$ N. will lead with not less than sixteen feet to the anchorage. Anchor as before with the light-house bearing SE. by E. $\frac{3}{4}$ E.

The above courses pass between five and six hundred yards to the eastward of Glover's Reef; about one hundred and fifty yards to the eastward of the black buoy on Blue-fish Reef Shoal; an eighth of a mile to the eastward of Four Feet Rock; a quarter of a mile to the westward of the red buoy on Great Captain's Island West Reef; and two hundred yards to the southward of Calf Island Reef.

TIDES.

Corrected Establishment.....	11 ^h 1 ^m
Mean Rise and Fall of tides.....	7.4 ft.
Mean Rise and Fall of Spring tides.....	8.2 ft.
Mean Rise and Fall of Neap tides.....	7.0 ft.
Rise of highest tide observed.....	9.1 ft.

BYRAM RIVER.

This is a narrow and shallow stream, for the most part bare at low water, which empties into the Sound just to the northward of Manursing Island; and its entrance, which is between Byram Point and the northern end of Manursing Island, is about six hundred yards wide, but soon contracts to a width of less than fifty yards about three hundred yards above Byram Point. Beyond this the width of the stream at high water varies, but is in no place greater than one hundred yards as far up as Port Chester, which is built on its western bank, three-quarters of a mile above its mouth.

Byram Point, the northern point of entrance, is low and rocky, bare of trees, and has a very gentle slope. It is connected with the mainland by a narrow sand beach faced with rocks; and from its southern end a rocky ledge extends to the southward for two hundred yards and is bare at half tide.

Manursing Island, whose northern end forms the southern point of entrance to the river, lies N NE. and S SW. and is about one mile long. It is composed of four islets of fast land, connected by marsh and sand beach, destitute of trees except on its summit, (which is wooded,) nearly level, and not more than twenty feet in height. At **Manursing Island**, its northeastern end it shows perpendicular faces to the eastward and northward. There are several houses on the island and a few trees on its southeastern end close to the shore-line. This island is very shoal on its eastern and southern sides and should not be approached, by vessels drawing over sixteen feet, nearer than seven hundred yards.

The eastern bank of Byram River above Byram Point shows as a very broken country, composed of innumerable rocky ridges separated by narrow ravines and crowned by bare ledges. About three-eighths of a mile above the point, however, the bare ledges disappear and the land, though much broken, is grassy and under some cultivation. The western shore is also hilly and shows steep rocky faces towards the river; but it is grassy and under cultivation, with a number of houses on the higher ground. This bank is also skirted in places with marsh which is covered at high water.

Strangers cannot enter Byram River, as it is full of dangerous rocks which are not buoyed; and it is also nearly bare at low water. Anchorage may be found, in westerly winds, under the northeastern shore of Manursing Island in from twelve to sixteen feet at low water; but it is very seldom used.

DANGERS

IN APPROACHING AND ENTERING BYRAM RIVER.

From the Eastward.—In approaching this harbor from the eastward the black buoy on Blue-fish Reef Shoal is first seen. This shoal has fifteen feet at low water and is, therefore, not dangerous to vessels intending to enter Byram River. It is only necessary, therefore, to remark that Byram Point bears from the buoy N. by W. $\frac{1}{2}$ W., a little over one mile distant.

Blue-fish Reef Shoal.

On the eastern side of the approach, bearing about **NE.** by **E.** $\frac{1}{2}$ **E.** from the buoy on Blue-fish Reef Shoal, will be seen the red spar-buoy (No. 2) on *Great Captain's Island West Reef*. This reef has been already described on page 493. About eight hundred yards **W.** by **N.** $\frac{2}{3}$ **N.** from the buoy on its western end and about eleven hundred yards **NE.** by **N.** from the red buoy on Blue-fish Reef Shoal lies the dangerous *Four Feet Rock*, which is marked by a horizontally-striped buoy.

When to the northward of Blue-fish Reef Shoal do not approach the eastern shore of Manursing Island nearer than four hundred yards to avoid Blue-fish Reef, parts of which are *Blue-fish Reef*. awash at low water. This reef makes off from Manursing Island between five and six hundred yards below its northern end, extending in a **SE.** by **S.** direction about two hundred and fifty yards. There is a rock awash upon its southeastern end but it is not buoyed. To avoid Blue-fish Reef vessels should not stand to the westward of Byram Point bearing **N.** $\frac{3}{4}$ **W.**

Next to the northward of Blue-fish Reef and about six hundred yards due **E.** from the northeast point of Manursing Island lies a group of half-tide rocks called *Byram Rocks*. They cover an area about one hundred and fifty yards long **NE.** and **SW.** and fifty yards wide, and being nearly always out are easily avoided. The western end of these rocks lies three-eighths of a mile **SE.** $\frac{2}{3}$ **S.** from Byram Point.

About four hundred and fifty yards **NW.** by **W.** $\frac{2}{3}$ **W.** from the western end of these rocks and nearly in the middle of the entrance to the river is *Channel Rock*, awash at low water. *Channel Rock*. From Byram Point it bears **S.** $\frac{2}{3}$ **E.**, about three hundred and fifty yards, and from the northeast point of Manursing Island **NE.** $\frac{1}{8}$ **N.**, three hundred yards distant. It is not buoyed.

Off the northeastern point of Manursing Island a ledge extends to the eastward for about three hundred yards and is called *Northeast Reef*. There are many bare rocks and rocks awash upon it and it is not buoyed, so that this point of the island should receive a berth to the westward of not less than three hundred and fifty yards.

Off Byram Point a dangerous ledge, bare at half-tide, extends in a **S.** by **E.** $\frac{1}{2}$ **E.** direction for about two hundred yards. It is not buoyed; but to avoid it, it is only necessary to give the point a berth to the northward of not less than three hundred yards. This reef is called *Byram Point Ledge*.

Above Byram Point no intelligible description of the dangers can be given.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING BYRAM RIVER.

I. From the Eastward.—Bring Great Captain's Island Light-house to bear **N.**, distant one mile and three-eighths, and the southeastern end of Manursing Island **W NW.**, distant two miles, and steer **NW.** $\frac{1}{2}$ **N.**, which course will lead with not less than twelve feet to the entrance to the river. Anchor in from twelve to sixteen feet about a quarter of a mile from the eastern shore of Manursing Island, with Great Captain's Island Light-house bearing **E.** $\frac{2}{3}$ **S.** Here, if bound into the river, you must take a pilot.

The above courses pass between six and seven hundred yards to the eastward of the black buoy on Blue-fish Reef Shoal; eight hundred and fifty yards to the westward of the red buoy on Great Captain's Island West Reef; four hundred yards to the westward of Four Feet Rock; a little over a quarter of a mile to the eastward of Blue-fish Reef; and about one hundred and seventy-five yards to the westward of Byram Rocks.

DANGERS

IN APPROACHING AND ENTERING BYRAM RIVER.

II. From the Westward.—The bight between Manursing Island and Rye Neck is full of dangerous rocks, many of which are out at half-tide and others awash at low water. This part of the shore should, therefore, receive a wide berth to the northward and westward. Of the numerous ledges between Manursing Island and Parsonage Point (the southeastern extremity of Rye Neck) the most easterly and consequently the most dangerous are *Forbes' Rock* and *Transport Rock*,—both awash at low water. The former, which is the southernmost and first met with by vessels from the westward, lies seven-eighths of a mile **NE.** by **E.** from Parsonage Point and the same distance **SW.** $\frac{1}{4}$ **S.** from the southeastern end of Manursing Island. From this rock Great Captain's Island Light-house bears **NE.** by **E.** $\frac{2}{3}$ **E.**, distant two miles and three-quarters, and the red buoy on Blue-fish Reef Shoal **NE.** by **E.**, distant one mile and three-eighths. There is no buoy.

Transport Rock lies about nine hundred yards **NE.** by **N. $\frac{1}{4}$ N.** from Forbes' Rock and eight hundred yards **SW. $\frac{1}{4}$ S.** from the southeastern end of Manursing Island. It is, in reality, a reef of rocks covering an area about two hundred yards long **E.** and **W.** and one hundred and fifty wide. There are many rocks awash scattered over this area and others having *Transport Rock*. from two to three feet upon them. The bearings, however, are taken from the middle of the reef. From the centre of Transport Rock the black buoy on Blue-fish Reef Shoal bears **E NE.**, distant one mile, and Great Captain's Island Light-house **E NE. Northerly**, distant a little over two miles and a quarter.

To avoid Transport Rock and Forbes' Rock do not stand to the northward of Great Captain's Island Light-house bearing **NE. $\frac{3}{4}$ E.**

When past Transport Rock the next danger met with is *Glover's Reef*, which lies off the southeastern end of Manursing Island at a distance of five hundred yards, is awash in some places at low water and is not buoyed. Vessels must, therefore, give this end of the island a berth to the westward of about half a mile.

When past Glover's Reef the dangers are the same and are met with in the same order as when approaching from the eastward. (See preceding page.)

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING BYRAM RIVER.

II. *From the Westward.*—Bring Execution Rocks Light-house to bear **SW. $\frac{1}{4}$ W.** and steer **NE. $\frac{1}{4}$ E.**, which will lead directly towards Great Captain's Island Light-house. On this course, when within two miles and a quarter of the light-house and the extreme northeastern end of Manursing Island is exactly in range with Byram Point on a bearing of **N. $\frac{1}{2}$ E.**, steer **N. by E. $\frac{3}{4}$ E.** for about one mile and three-eighths, passing to the westward of Blue-fish Reef Shoal and carrying not less than sixteen feet at low water. On this course, when in twenty feet, with Great Captain's Island Light-house bearing **E. $\frac{3}{4}$ N.**, one mile and a quarter distant, steer **N. by W. $\frac{3}{4}$ W.** for Byram Point and anchor in fifteen feet, soft bottom, with the southern end of the southernmost Calf Island bearing **E. by N. $\frac{3}{4}$ N.** and the northern end of Manursing Island **W. $\frac{3}{4}$ S.**, three hundred and fifty yards distant.

The above courses pass half a mile to the southward of Forbes' Rock; five-eighths of a mile to the southward and half a mile to the eastward of Transport Rock; four hundred yards to the eastward of Glover's Reef; three hundred yards to the westward of the black buoy on Blue-fish Reef Shoal; four hundred yards to the eastward of Blue-fish Reef; three-quarters of a mile to the westward of the red buoy on Great Captain's Island West Reef; three-eighths of a mile to the westward of Four Feet Rock; and one hundred and fifty yards to the westward of Byram Rocks.

MILL CREEK.

This insignificant stream makes in to the northeastward between Rye Point on the east and Hen Island on the west, and between the two is about three-eighths of a mile wide with a depth of from two to four feet at mean low water. Its width rapidly diminishes, however, and but little over a mile above its mouth it suddenly contracts to a mere brook about fifty feet wide, on the banks of which are built the villages of Milton and Rye.

Rye Point, the eastern point of entrance, is the southwestern end of **Rye Neck**, and is the southernmost of a line of flat wooded islets separated by marsh, extending about **SW. $\frac{1}{2}$ S.** from the neck. A line of bare reefs and rocky islets extends from the point southwesterly six hundred and fifty yards and terminates in a ragged-looking mass of bare rocks known as The Scotch Caps.

Hen Island, which forms the western side of the entrance, is the southern extremity of a long marshy point dotted with similar islets which extends from the mainland **SW. by S.** half a mile. It is low, flat, and wooded like most of the islets in this vicinity.

Both banks of Mill Creek are fringed with marsh, behind which appear on the east the nearly level lands of Rye Neck, with tall trees on the summit; and on the west the higher and more hilly country separating this creek from Mamaroneck River to the westward. This western bank shows in places steep almost perpendicular faces, with occasional groves of trees close to the edge of the bank, but is for the most part cleared.

Milton is situated on the eastern bank of the stream, about a mile above its mouth; while **Rye** occupies both banks two and a half miles above the mouth. Between the two villages both banks are under cultivation.

Mill Creek is of no importance commercially,—being bare at low spring tides; but anchorage is sometimes found off its mouth in from ten to fifteen feet, sheltered from northerly winds. It is not much used, however, on account of the many dangers obstructing its approach.

DANGERS

IN APPROACHING AND ENTERING MILL CREEK.

Strangers must not attempt to make this anchorage. The channel is narrow and but few of the dangers are buoyed. If coming from the eastward the first danger met with is Rye Point Ledge, a mass of bare and sunken rocks lying about six hundred and fifty yards due S. from Rye Point. Ten feet is found between this ledge and the point, but the channel is narrow and unsafe. The southern end of the ledge bears from Parsonage Point (the southeastern end of Rye Neck) SW. $\frac{1}{4}$ W., distant three-quarters of a mile, and from Great Captain's Island Light-house SW. by W., distant four miles and a quarter. To avoid it, therefore, it is only necessary to keep to the southward of Great Captain's Island Light-house bearing NE. $\frac{3}{4}$ E.

The Scotch Caps are shoal on their southern side,—sunken and bare rocks extending about SW. by S. for three hundred and fifty yards. This danger may also be avoided by not standing to the northward of Great Captain's Island Light-house bearing NE. $\frac{3}{4}$ E. until you head up for the entrance. The outermost rock is, however, bare at low water, and if it can be seen you may approach it within one hundred yards with not less than seventeen feet. A red spar-buoy (No. 2) is placed off the southern end of The Scotch Caps.

On the western side of the entrance, about eight hundred yards W. by S. $\frac{1}{4}$ S. from the southern end of The Scotch Caps, lies Ship Rock, a detached ledge with about one foot at low water. From Rye Point it bears SW. by W., five-eighths of a mile, and from Hen Island SW. by S. $\frac{3}{4}$ S., three-eighths of a mile distant. In coming from the westward Execution Rocks Light-house bearing SW. by S. clears this rock. A spar-buoy painted red and black in horizontal stripes is placed just to the southwestward of the rock,—the channel passing between it and the red buoy No. 2.

Between Ship Rock and Hen Island, and between one hundred and fifty and one hundred and seventy-five yards from the former, are several detached sunken rocks with from six to eight feet upon them. They are not buoyed and no directions can be given for avoiding them other than to keep to the eastward of the eastern point of Hen Island bearing NNE.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING MILL CREEK.

I. *From the Eastward.*—Bring Great Captain's Island Light-house to bear NE. and steer SW. until Rye Point bears NW. by N. $\frac{3}{4}$ N., distant one mile and a quarter. Here you will have eight fathoms and must steer NW. by W. for about one mile, or until Great Captain's Island Light-house bears NE. by E. $\frac{1}{2}$ E. (seen just to the southward of Parsonage Point) and the middle of Hen Island N. $\frac{1}{2}$ W., distant half a mile. Now steer N. by W. $\frac{1}{4}$ W. for about three-eighths of a mile and anchor in from twelve to fourteen feet about four hundred yards to the southward of Hen Island with Rye Point bearing NE. by E. $\frac{3}{4}$ E.

The above courses pass half a mile to the westward of Rye Point Ledge; three hundred yards to the westward of the outermost rock off The Scotch Caps; an eighth of a mile to the eastward of Ship Rock; and one hundred and fifty yards to the eastward of the ledges to the northward of that rock.

II. *From the Westward.*—Bring Execution Rocks Light-house to bear SW. $\frac{1}{2}$ S. and steer NE. $\frac{1}{2}$ N. until Great Captain's Island Light-house bears NE. $\frac{3}{4}$ E. and Hen Island N. $\frac{1}{2}$ W. Steer for the latter and anchor in from ten to thirteen feet, with Rye Point bearing about NE. $\frac{1}{2}$ E.

The above courses pass three hundred yards to the westward of the outermost rock off The Scotch Caps and three hundred and fifty yards to the eastward of Ship Rock.

Or, bring Execution Rocks Light-house to bear SW. by S. and steer NE. by N., which course will lead directly to the anchorage. Anchor in from twelve to fourteen feet with Rye Point bearing NE. $\frac{1}{2}$ E.

The above course passes three hundred yards to the westward of the outermost rock off The Scotch Caps and two hundred yards to the eastward of Ship Rock.

MAMARONECK RIVER.

This river empties into a large cove embraced between Hen Island on the east and Delancey's Point on the west. It is narrow, shallow, and of little importance; but anchorage in from seven to eleven feet is found in the cove off its mouth. Between Hen Island and Delancey's Point the entrance to the cove is about one mile wide. The shores are low and nearly level except on the northern side, where the country is somewhat hilly and rugged in outline. Its eastern shores are marshy, alternated with

flat wooded islands, while the northern shores are faced with rocks and diversified with woods and cleared lands alternately; and the western shore, from Delancey's Point to the mouth of the river, is low and nearly level, bare of trees except on its summit, (where there is a large grove about three hundred yards inland,) and faced by a sand beach strewn with boulders.

The river is about three hundred yards wide at its mouth, but gradually contracts as it approaches "the divide," a quarter of a mile above. Here it is less than two hundred yards wide and branches,—one branch running to the westward for about eight hundred yards, and the other to the northwestward about half a mile to the village of Mamaroneck. Both banks are fringed with marsh, but the eastern bank is higher and more hilly than the western, which is composed of nearly level grassy land with here and there a clump of trees.

DANGERS

IN APPROACHING AND ENTERING MAMARONECK RIVER.

In approaching this harbor from the eastward the first danger met with is the reef off *The Scotch Caps*, marked by a red spar-buoy (No. 2), and already described in the approaches to Mill Creek. On the western side of the entrance, however, it will be necessary to look out for the sunken rocks and bare ledges off Delancey's Point. The general name Delancey's Point Ledge is given to this shoal, which makes about **SE. $\frac{1}{2}$ E.** from the point for a quarter of a mile and is in many places bare at low water. It is easy to avoid it, however, by giving the point a berth to the westward of three-eighths of a mile, or by not standing to the westward of Execution Rocks Light-house bearing **SW.** by **S. $\frac{3}{4}$ S.** On the southeastern end of this ledge is placed a black spar-buoy (No. 1).

*Delancey's
Point Ledge.*

About half a mile to the northeastward of the end of Delancey's Point Ledge and four hundred yards from shore is a ledge about seventy-five yards long and bare at half-tide. It is not buoyed, but is easily avoided,—being almost always out.

Ship Rock (which is marked by a spar-buoy painted red and black in horizontal stripes) and the ledges between it and *Hen Island* have been already described in the approaches to Mill Creek. *Ship Rock* bears from Delancey's Point **E. $\frac{3}{4}$ N.**, a little over three-quarters of a mile distant; and to avoid it, as well as the ledges to the northward of it, you must not go to the eastward of Execution Rocks Light-house bearing **SW.** by **S. $\frac{1}{4}$ S.** or *Hen Island* **NE.** by **N. $\frac{1}{4}$ N.**

When well past Delancey's Point and nearly opposite to *Hen Island* there will be seen a little to the eastward a spar-buoy painted red and black in horizontal stripes, and to the westward, almost exactly in the middle of the entrance to the river, will be seen another buoy also painted red and black. The easternmost is on *Steamboat Rock*, which lies about a quarter of a mile from the northern shore of the harbor and about the same distance to the northwestward of *Hen Island*. The westernmost buoy marks what is locally known as *Single Rock*. As strangers, however, should never attempt to proceed thus far without a pilot, a further description of these dangers and marks is unnecessary.

*Steamboat and
Single Rocks.*

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING MAMARONECK RIVER.

I. *From the Eastward.*—Bring Great Captain's Island Light-house to bear **NE. $\frac{1}{8}$ N.**, four and a half miles, and the extreme southwestern end of Rye Point **NW.** by **N. $\frac{5}{8}$ N.**, one mile and a quarter distant, and steer **NW.** by **W. $\frac{1}{8}$ W.**, carrying not less than twelve feet, until *Hen Island* bears **NE. $\frac{3}{8}$ E.**, nearly half a mile, and the southern end of *The Scotch Caps* **E. $\frac{1}{2}$ N.**, five-eighths of a mile distant, when steer **N.** by **W. $\frac{3}{4}$ W.** for about eight hundred yards and anchor in eight feet off the mouth of the river. Beyond this strangers cannot go without a pilot.

Or, you may continue the NW. by **W. $\frac{1}{8}$ W.** course towards the western shore and anchor in eight feet about a quarter of a mile from it.

The above courses pass four hundred yards to the westward of the outermost rock off *The Scotch Caps* and one hundred and fifty yards to the westward of *Ship Rock*.

II. *From the Westward.*—Bring Execution Rocks Light-house to bear **SW.** by **S. $\frac{3}{4}$ S.** and steer **NE.** by **N. $\frac{3}{4}$ N.**, which course will lead with not less than nine feet to an anchorage between *Hen Island* and the Mamaroneck shore. Here there is nine feet at low water.

The above course passes three hundred yards to the eastward of Delancey's Point Ledge; two hundred and fifty yards to the eastward of the sunken rocks **NNE.** of that ledge; seven hundred yards to the westward of *Ship Rock*; and six hundred yards to the westward of the ledges between that rock and *Hen Island*.

HEMPSTEAD HARBOR.

This harbor lies on the southern side of the Sound, nearly opposite to Rye Neck, and makes in between Red Spring Point on the east and Prospect Point on the west. It is formed by a large bay four and a half miles long **N. and S.** and two miles and three-quarters wide at its mouth, but it gradually contracts in width to its head, where it is a mere brook. Here is situated the village of **Hempstead** or **Roslyn**. The harbor proper ends about three miles above the mouth of the bay, where its width is diminished to two hundred yards by Harbor Beach, a long and narrow strip of sand making out from the western shore. To the southward of this beach it spreads out again to a width of seven hundred yards, which it keeps for a little over a mile and terminates abruptly in a narrow stream leading to Hempstead.

Red Spring Point, the eastern point of entrance to this harbor, is a steep wooded bluff with perpendicular sandy faces and level grassy summit. On its extreme southwestern end there is a large clump of high bushy trees; and the **Red Spring Point** beach at its base shows a number of large boulders extending out below low-water line. This feature is repeated abreast of every projection on both shores of the harbor. Red Spring Point is comparatively bold-to and may be approached within four hundred yards with not less than four fathoms.

Prospect Point, the western point of entrance, appears, when seen from the westward, as a high grassy bank with steep sandy faces, rising abruptly from a low beach. There is a thin fringe of trees on top, but near the edge of the bluff the surface has the appearance of a nearly level grassy field. The point is fringed with rocks; and there are a number of outlying boulders, prominent among which is **The Old Hen**, three hundred yards from shore and awash at low water. When viewed from the eastward Prospect Point presents an entirely different appearance, having a very gentle rise from the low sand beach which skirts its eastern side and being destitute of trees. A very small stream, bare at low water, makes in between sandy and marshy banks on this side of the point.

Prospect Point is the northern extremity of **Cow** or **Manhasset Neck**, which separates Hempstead Harbor from Manhasset Bay. From this point the western shore of the harbor has a general direction about **SE.** by **E.** for nearly two miles to **Mott's Point**. This point, which is one of the landmarks for entering the harbor from the eastward, is very prominent when seen from the Sound, appearing as a high, perpendicular, sandy bluff at the eastern extremity of a long line of precipitous cliffs of yellow sand extending northwesterly nearly to Prospect Point. On its summit the point is fringed with scrub backed by thick woods. There is a large house near the top of the hill.

The eastern shore of the harbor takes a general direction about **S. ½ W.** and is composed for the most part of a high rolling country, diversified with woods and cultivated fields and dotted at intervals with houses. A little over three-quarters of a mile below the point will be seen a small settlement on the beach at the base of the hills, and a long wharf making out in a southwesterly direction. This is **Glen Cove Landing**, situated at the northwestern end of a thinly wooded hill called **Mosquito Neck**. Between Red Spring Point and the landing the shore presents perpendicular sandy faces from twenty to forty feet high,—the land rising with a gentle slope to the top of the cliffs to a height of about one hundred and fifty feet and thinly wooded. The shore is skirted by a sand beach and each projecting point has a line of boulders extending out from it.

From Glen Cove Landing to the entrance to Mosquito Cove, half a mile to the southward, the cliffs almost entirely disappear,—the land rising with a regular and gradual slope to a height of nearly two hundred feet, partly wooded and partly cleared. Mosquito Cove, a very narrow, shallow and crooked stream, makes in to the eastward for about three-quarters of a mile between Mosquito Neck on the north and Carpenter's Neck on the south. It is closed at its mouth by a causeway. The village of **Glen Cove** is situated on the banks of the mill-pond about three-quarters of a mile from the mouth of the cove and at the eastern base of Mosquito Neck.

Carpenter's Point, the western extremity of **Carpenter's Neck**, is on the southern side of the entrance to Mosquito Cove and is remarkable when seen from the Sound,—appearing as a high yellow bluff, with precipitous faces about fifty feet high and a thinly wooded summit. From the top of the cliff the land rises very gradually to a height of about one hundred feet and is for the most part grassy. On its southern side the land near the shore-line is level and grassy, dotted at intervals with houses and a few trees and showing low precipitous faces to the westward. Three-eighths of a mile below the southwestern end of Carpenter's Neck begins a long narrow strip of beach, extending in a southerly direction for about six hundred yards nearly parallel to the shore, leaving a narrow cove, bare at low water, between it and the mainland. This is called **East Beach**. To the southward of it the eastern shore of the harbor appears undulating of moderate height, with here and there perpendicular bluffs, and diversified with grass lands, cultivated fields, occasional clumps of woods and groups of houses.

A quarter of a mile to the southward of East Beach and almost directly opposite to Harbor Beach is a steep bluff hill called **Cheeseman's Hill**; and about six hundred yards to the southward of this a round, smooth, nearly level point, with low cliff-like faces and a long wharf making out from it to the westward. This is **Mott's Landing**,—the northern point of entrance to **Mott's Cove**, a shallow stream, bare at low water, which runs in an easterly direction for a little over a quarter of a mile to a mill-dam. There is a small settlement on the northern bank of the stream.

From Mott's Cove the land is lower near the shore-line, but has low precipitous faces and thinly wooded slopes for about half a mile to the southward. Thence to the head of the harbor it is low, flat and level, dotted with houses and groves of ornamental trees.

The western shore of Hempstead Harbor from Mott's Point has a general direction about **S.** by **E. ½ E.** to Harbor Beach, nearly two miles below. This shore is nearly straight and very uniform in appearance,—being composed of hills of various

heights, (from forty to one hundred and fifty feet,) their slopes showing alternate woods and cleared lands and their summits being for the most part under cultivation. There are, however, occasional groves to be seen on the high lands at some distance back from the shore-line. From Mott's Point, for about three-eighths of a mile to the southward, the land has a very gentle rise and is alternately cleared and wooded; but below this it is much steeper, nearly all wooded, and shows precipitous faces here and there. There are but few houses on this shore.

Harbor Beach is a narrow strip of sand beach six hundred yards long, which makes to the eastward from the western shore of the harbor about two miles below Mott's Point and diminishes the width of the available channel to less than one hundred yards. It forms the southern boundary of the harbor proper,—there being no navigation beyond this point.

To the southward of Harbor Beach the western shore of the harbor shows land of a nearly uniform height, (about eighty feet,) with wooded slopes, somewhat steep, and level summits almost entirely under cultivation. A narrow fringe of flat land dotted with houses skirts the base of the hills at intervals until the village is reached, where the higher lands retire back and the level lands, thickly dotted with houses and clumps of trees, extend to the water's edge.

DANGERS

IN APPROACHING AND ENTERING HEMPSTEAD HARBOR.

I. *From the Eastward.*—The only danger met with in approaching this harbor from the eastward is **Matinicock Point Shoal**, which makes off to the northward from Matinicock Point about six hundred yards and is marked by a black spar-buoy (No. 19) placed **Matinicock Point Shoal.** about six hundred yards close to a sunken rock with sixteen feet water. There is twelve feet at low water just inside this buoy, and vessels coming from the eastward should give the buoy a berth to the southward of not less than one hundred and fifty yards.

Between Matinicock Point and Red Spring Point the shore should receive a berth to the eastward of six hundred yards; and Red Spring Point should not be approached nearer than three hundred yards on account of *the outlying rocks off that point.*

On the western side of the harbor Mott's Point should receive a berth of not less than three-eighths of a mile to the westward to avoid Mott's Point Shoal, which makes off in a north-easterly direction a quarter of a mile and has a number of sunken rocks and rocks awash upon it. Of these, *Picket Rock* is one of the most dangerous,—being awash at low water and lying a quarter of a mile **N. by W.** from the extremity of the point. **Mott's Point Shoal.**

When past Mott's Point and approaching East Beach look out for *Downing's Landing Shoal*, which makes off from **Downing's Landing** (on the southern side of Carpenter's Neck) for seven hundred yards and is bare at low water a quarter of a mile from shore. It is not buoyed; and to avoid it you must keep the western shore aboard.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING HEMPSTEAD HARBOR.

I. *From the Eastward.*—On the **W. by S. $\frac{1}{4}$ S.** course through the Sound, when Execution Rocks Light-house bears **W. by S. $\frac{1}{2}$ S.**, four miles, Sands' Point Light-house **SW. by W. $\frac{1}{2}$ W.**, four miles, and Mott's Point **S SW.**, three miles distant, steer for the latter until within one mile and an eighth of it, with Red Spring Point bearing **E. $\frac{1}{4}$ N.**, distant three-quarters of a mile. Here you will have five fathoms and must steer **S. $\frac{1}{4}$ E.**, carrying not less than fifteen feet, until just past Downing's Landing, having the end of the road leading down to the landing bearing **E. by N. $\frac{3}{4}$ N.**, eight hundred yards distant. Here there will be sixteen feet, with the eastern extremity of Harbor Beach bearing **SSE. Easterly**, and that course should be steered, which will lead with not less than fifteen feet to the head of the harbor. You may anchor anywhere on these courses after passing Red Spring Point.

The harbor is open to the northward and is resorted to in easterly, westerly and southerly winds only. The above courses pass nine hundred yards to the northward of the black buoy on Matinicock Point Shoal; five-eighths of a mile to the westward of Red Spring Point; half a mile to the eastward of Picket Rock; six hundred and fifty yards to the eastward of Mott's Point Shoal; and two hundred yards to the westward of Downing's Landing Shoal.

DANGERS

IN APPROACHING AND ENTERING HEMPSTEAD HARBOR.

II. *From the Westward.*—On approaching Prospect Point from the westward look out for Prospect Point Shoal, which makes off from that point to the northward half a mile and has a number of sunken rocks and rocks awash at low water upon it. There is **Prospect Point Shoal.** less than three feet upon this shoal four hundred yards from shore; and vessels bound

into this harbor should give it a berth to the southward of not less than half a mile. Prominent among the rocks is *The Old Hen*, which is awash at low water and lies three hundred yards N. by E. $\frac{1}{4}$ E. from Prospect Point.

A buoy is very much needed on the northern end of Prospect Point Shoal and will be recommended to the Light-house Board. In coming from the westward, to avoid this shoal do not stand to the southward of Execution Rocks Light-house bearing W. $\frac{3}{4}$ N.

When past Prospect Point there are no dangers until you come up with *Mott's Point Shoal*; but the west shore between the two points should receive a berth to the westward of not less than six hundred and fifty yards.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING HEMPSTEAD HARBOR.

II. *From the Westward*.—On the E. by N. $\frac{1}{8}$ N. course from off Sands' Point, when just past Prospect Point, with Sands' Point Light-house bearing SW. $\frac{1}{4}$ S., one mile and a quarter, and Mott's Point SE. $\frac{3}{8}$ S., two miles and a quarter distant, you will have nine fathoms, with the wharf at Glen Cove Landing bearing SE. by E. $\frac{1}{4}$ E., nearly three miles distant. Steer for the wharf, carrying not less than four and a half fathoms, until you are within five-eighths of a mile of it, with Red Spring Point bearing NE. $\frac{3}{4}$ E., seven-eighths of a mile, and Mott's Point SW. $\frac{3}{4}$ S., three-quarters of a mile distant. Now steer S. $\frac{1}{4}$ E. and follow the directions for the harbor given on the preceding page.

The above courses pass three hundred yards to the northward of Prospect Point Shoal; half a mile to the northeastward of The Old Hen; eleven hundred yards to the northeastward and half a mile to the eastward of Picket Rock; and six hundred and fifty yards to the eastward of Mott's Point Shoal.

DELANCEY'S COVE.

This cove lies on the northern shore of Long Island Sound, next to the westward of Mamaroneck Entrance. It is of irregular shape, about nine hundred yards in diameter, very shoal and much obstructed by ledges, some of which lie almost in the middle of the cove. Its entrance, between Long Beach Point on the east and West Point on the west, is about eight hundred and fifty yards wide with twelve feet in the channel; but the approach to it is obstructed by a dangerous ledge, with bare rocks and rocks awash upon it, called Long Beach Point Reef. There is an equally good channel on both sides of this reef.

Long Beach Point is a long, flat, sandy point, covered with grass and backed by marsh. It is half a mile SW. $\frac{1}{2}$ W. from Delancey's Point and is skirted by a beach strewn with boulders. Being somewhat shoal it should not be approached nearer than three hundred yards.

West Point is a flat rocky point,—the southeastern extremity of a smooth, nearly level, grassy neck, of which **Premium Point**, one mile to the westward, is the southwestern end. It is fringed with rocks but is quite bold-to,—three fathoms being found within seventy-five yards of it. A line of bushy trees skirts the shore at this point and there are clumps at intervals along the western shore of the cove, but back of the shore-line the land is all cleared, grassy, nearly level, and destitute of trees.

The eastern and northern shores of Delancey's Cove are composed of alternate marsh and woods,—the latter being fringed with rocks. The western shore is low and nearly level, with alternate grassy land and clumps of trees. A long reef of rocks bare at half tide makes off from a point on the eastern shore about three eighths of a mile above Long Beach Point, extending in about a SW. by W. direction for a quarter of a mile and effectually closing navigation for even the smallest vessels except at high water.

DANGERS

IN APPROACHING AND ENTERING DELANCEY'S COVE.

In approaching Delancey's Cove either from the eastward or westward there is but one danger met with, but that a very serious one,—being bare in places at half tide, in others awash at low water, and elsewhere over its area having from two to five feet upon it. It lies nearly N. and S., covers an area nine hundred yards long by five hundred wide within the lines of six feet, and is known as Long Beach Point Reef. There is no buoy, but its northern end bears from Long Beach Point SW. $\frac{1}{2}$ S., distant a little over half a mile, and from Premium Point E. by N. $\frac{1}{2}$ N., distant about one mile. The southern end of the reef bears from Whortleberry Island (southern end) NE. $\frac{1}{4}$ N., one mile and a half, and from Premium Point E. $\frac{1}{4}$ S., a little over one mile distant.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING DELANCEY'S COVE.

I. *From the Eastward*.—On the W. by S. $\frac{1}{8}$ S. course through the Sound, when Execution Rocks Light-house bears W. by S. $\frac{3}{8}$ S. and Long Beach Point NW. $\frac{3}{4}$ W. steer NW. by W., which will lead to the anchorage between West Point and Long Beach Point. The depth at the anchorage is from seven to eleven feet at low water.

Or, you may bring Great Captain's Island Light-house to bear NE. $\frac{1}{4}$ E. and steer SW. $\frac{1}{4}$ W. until Sands' Point Light-house bears S. by W. $\frac{1}{4}$ W., with a depth of between six and seven fathoms. Now steer NW. by W. and follow the directions given above.

The above courses pass eight hundred yards to the eastward of Long Beach Point Reef.

II. From the Westward.—To pass to the Westward of Long Beach Point Reef and enter Delancey's Cove.—On the NE. course from off Stepping Stones Light-house, when Sands' Point Light-house bears NE. by E. $\frac{1}{4}$ E., distant one mile and three-eighths, and Execution Rocks Light-house NE. $\frac{1}{8}$ N., distant one mile and three-quarters, you will have eleven fathoms and N. by E. $\frac{1}{2}$ E. will lead with not less than four fathoms past Whortleberry Island and the entrance to Kellogg's Cove. On this course, when the southern end of Premium Point bears W. $\frac{5}{8}$ N., distant three-quarters of a mile, and the eastern extremity of West Point N. by E. $\frac{5}{8}$ E., distant nearly three-quarters of a mile, steer N NE., which will lead safely to the anchorage.

The above courses pass three hundred yards to the westward of Long Beach Point Reef.

KELLOGG'S COVE.

This anchorage lies about one mile and a quarter to the westward of Delancey's Cove and is contained between Premium Point on the east and Davenport's Neck on the west. Between Gut Island (which lies off Premium Point) and the neck it is about a quarter of a mile in diameter; but above this it spreads out to a width of about half a mile. The available width of the cove, however, is not more than four hundred yards at low water.

Premium Point, the eastern point of entrance, is low, flat and wooded, and terminates to the westward in marsh fringed with rocks, joining it to Gut Island. The country behind it is cultivated and well settled and is low and somewhat undulating. **Gut Island** is a marshy islet about three hundred yards long N. and S., is fringed with rocks, and has clumps of trees on its northeastern and southern ends. There is a small wooded islet about one hundred and fifty yards to the northwestward of it.

Davenport's Neck, on the western side of the cove, lies NE. and SW. and is about one mile long. It is entirely under cultivation, somewhat higher than the adjacent shores, but with very gentle slopes, and is fringed alternately with beach and marsh,—the former being strewn with boulders. The rest of the shores of the cove are composed principally of marsh dotted with wooded islets.

DANGERS

IN APPROACHING AND ENTERING KELLOGG'S COVE.

It is not safe to attempt to enter Kellogg's Cove unless with the assistance of a competent pilot. Although there are many channels leading among the numerous islands which obstruct the approach from the westward, yet, as none of the ledges extending off from these islands are buoyed, strangers should never attempt any of the passages.

Approaching from the eastward only two dangers obstruct the approach, viz: Long Beach Point Reef and Middle Shoal, and the sailing-line gives each a good berth. Long Beach Point Reef has been already described, in the approaches to Delancey's Cove, as a **Long Beach Point Reef.** dangerous reef nearly half a mile long N. and S. and in places bare at half tide. Its southern extremity bears from Gut Island E. $\frac{5}{8}$ S., distant one mile; from the dry part of Middle Shoal NE. by E. $\frac{5}{8}$ E., distant one mile and an eighth; and from Whortleberry Island (southern extremity) NE. $\frac{1}{4}$ N., one mile and a half distant. It is not buoyed.

Middle Shoal is a very dangerous detached shoal, surrounding a small marshy islet, covered at high water. It lies nearly N. and S., and that portion of it which is bare at low water covers an area three hundred and fifty yards long by two hundred broad and is strewn with **Middle Shoal.** boulders. Four feet at low water is found upon its northern end, six feet upon its eastern end close to a rock awash, two feet upon its southern end, and five feet on its western end. It is not buoyed, but as the dry part almost always shows itself the shoal may be easily avoided by giving that part a berth to the westward of a quarter of a mile, or by not going to the westward of the eastern extremity of Whortleberry Island bearing S. by W.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING KELLOGG'S COVE.

I. From the Eastward.—On the W. by S. $\frac{1}{4}$ S. course through the Sound, when Execution Rocks Light-house bears W. by S., nearly two miles and a quarter, and Sands' Point Light-house SW. by W., about the same distance, you will have about six and a half fathoms and W NW. will lead safely to the anchorage, in fifteen feet, about midway between Gut Island and Davenport's Neck. There is nothing in the way on this course and you may anchor at discretion by keeping the western shore rather the best aboard.

The above course passes six hundred yards to the southwestward of Long Beach Point Reef and the same distance to the northeastward of the northern end of Middle Shoal.

II. *From the Westward.*—On the NE. course from off Stepping Stones Light-house, when Sands' Point Light-house bears NE. by E. $\frac{3}{4}$ E., distant one mile and three-eighths, and Execution Rocks Light-house NE. $\frac{7}{8}$ N., distant one mile and three-quarters, steer N. by E. $\frac{1}{2}$ E., (as directed for approaching Delancey's Cove from the westward,) and continue this course until you are past Whortleberry Island (its southeastern end bearing SW. $\frac{3}{4}$ W., distant three-eighths of a mile) and Davenport's Island opens to the northward of the northern end of Whortleberry Island. Here you will have five fathoms and NW. by N. will lead safely to the anchorage between Gut Island and Davenport's Neck.

The above courses pass a quarter of a mile to the eastward of Whortleberry Island and two hundred yards to the eastward of Middle Shoal.

MANHASSET BAY.

This bay lies on the southern side of the Sound, and is embraced between Cow or Manhasset Neck on the east and Great Neck on the west. It is of irregular shape, makes in a SE. direction, is nearly four miles long, seven-eighths of a mile wide at its mouth, and does not begin to diminish in width until you are past Mott's Point, one mile and three-quarters above the entrance. It affords anchorage in from ten feet to seven fathoms, sheltered from all winds; but only fourteen feet at low water can be taken across the bar at its entrance.

Barker's Point, the eastern point of entrance to the bay, is the northwestern extremity of Cow or Manhasset Neck, and is a little over one mile to the southwestward of Sand's Point Light-house. It is a high sandy bluff, with nearly perpendicular faces and level grassy summit, fringed with a thin growth of large trees. A very dangerous reef of rocks extends from it in a NW. $\frac{1}{4}$ N. direction for five-eighths of a mile and is marked by a black buoy numbered 23. It is, therefore, not safe to approach this point from the northward nearer than three-quarters of a mile.

Hewlett's Point, the western point of entrance to the bay, is nearly one mile to the westward of Barker's Point, and is of moderate height and grassy, with steep faces and backed by thick woods. It is the extreme northern end of Great Neck, and between it and the southern end of Hart Island the width of the Sound is but three-quarters of a mile.

The eastern shore of Manhasset Bay, which is formed by the western side of Manhasset Neck, has a general course about S SE. for nearly one mile to the southern extremity of Plum Beach, formerly called Long Beach. The land is low, somewhat undulating, but very nearly level, for the most part under cultivation, but with a few groves of trees appearing here and there, especially in the vicinity of Long Beach. The latter is a narrow strip of sand about six hundred yards long, extending in a S. $\frac{3}{4}$ W. direction from the mainland, and is bold-to,—four fathoms being found within two hundred yards of the beach.

To the southward of Plum Beach the shore spreads away to the eastward, trending about E. $\frac{1}{2}$ S. for three-quarters of a mile and then about S. by E. for nearly half a mile,—thus increasing the width of the bay to a little over one mile. The land is of moderate height, undulating, with steep faces here and there, and level summits, diversified with wooded, cultivated and settled lands. A small shallow cove makes into the eastern shore nearly one mile beyond Plum Beach and almost directly opposite to Mott's Point. It is closed at its head by a mill-dam and has a wharf making out from its eastern shore near its mouth.

About a quarter of a mile to the southward of this wharf begins Mitchell's Bluff, a steep bluff about eighty feet high, with perpendicular faces and a partly wooded and partly cleared summit. It descends to the southward to nearly level though slightly undulating land, averaging in height from twenty to forty feet, and with low perpendicular faces here and there. It is nearly all under cultivation, and grassy lands and orchards appear alternately. This portion of the shore is also pretty thickly settled, and the houses increase in number until the village of Manhasset is reached, which occupies the eastern bank nearly four miles above Barker's Point.

The western shore of Manhasset Bay is formed, as before mentioned, by the eastern side of Great Neck, and is composed of alternate wooded and cleared lands of moderate height. From Hewlett's Point to Mott's Point its general course is about SE. and the distance one mile and three-quarters;—nearly level but slightly undulating lands, cultivated and dotted with houses, alternating with higher wooded lands, the whole faced by a sand beach with occasional outlying boulders. Mott's Point is about forty feet high, with grassy summit and steep face to the eastward. Here the western shore takes a turn to the southward, running about S. by E. for two miles to the head of the bay. The land is mostly cleared, cultivated and well settled for about one mile above Mott's Point; but beyond this woods and cleared fields appear alternately. The bay is bare at low water from its head to within one mile of Mott's Point.

DANGERS

IN APPROACHING AND ENTERING MANHASSET BAY.

I. *From the Eastward.*—On approaching this harbor from the eastward the first danger met with is Prospect Point Shoal, already described in the approaches to Hempstead Harbor as a long reef making out from Prospect Point in a northerly direction for half a mile, with a number of sunken rocks and rocks awash at low water upon it. There

is less than three feet upon this shoal four hundred yards from shore. Prominent among the rocks is *The Old Hen*, which is awash at low water and lies three hundred yards N. by E. $\frac{1}{4}$ E. from Prospect Point.

A buoy is very much needed on the northern end of Prospect Point Shoal and will be recommended to the Light-house Board.

When past Prospect Point there will be seen to the northward of the course, first, a spar-buoy painted red and black in horizontal stripes, bearing about NW. $\frac{1}{2}$ N., three-quarters of a mile off; second, a white tower with grey stone building attached, bearing nearly W. by N., and five-eighths of a mile off; and thirdly, another horizontally striped buoy, bearing *Execution Rocks and Light-house* about W. $\frac{1}{2}$ S., and three-quarters of a mile off. These are all on Execution Rocks, which lie nearly in the middle of the Sound at this point,—being three-quarters of a mile to the northward of Sand's Point and seven-eighths of a mile to the southward of Whortleberry Island. The first-mentioned buoy is on the northern end of the shoal; the light-house on the bare rocks near the middle; and the second buoy on the southern end. The light-house is called Execution Rocks Light-house, and shows a fixed white light, of the fourth order of Fresnel, from a height of fifty-eight feet above the sea, visible thirteen miles.

During thick weather a fog-trumpet gives blasts seven seconds long at intervals of forty-three seconds; and there is an Anderson's fog-horn which is intended to be sounded in case of accident to the fog-trumpet. From this light-house the buoy on the northern end of the shoal bears N NE., about half a mile, and the buoy on the southern end SW. $\frac{1}{4}$ W., six hundred yards distant.

You may pass on either side of Execution Rocks; but it is the usual custom to pass to the southward of them. The channel is wider on the north side,—being about three-quarters of a mile in width between Whortleberry Island and Execution Rocks with a depth of from five to sixteen fathoms,—but the southern channel is the more direct, though only eight hundred yards wide.

From the buoy on the southern end of Execution Rocks the southern end of Hart Island bears SW. $\frac{3}{4}$ S. and Stepping Stones Light-house SW. $\frac{1}{4}$ S.

On the southern side of the channel, and directly opposite to Execution Rocks Light-house, will be seen a black spar-buoy off Sands' Point. This is on Sands' Point Reef, which makes off to the northward from that point for about six hundred yards and has soundings *Sands' Point Reef* over it varying from two to seventeen feet at low water. The buoy is marked No. 21, and bears from Sands' Point Light-house NW. $\frac{3}{4}$ N., a quarter of a mile, and from Execution Rocks Light-house S. by E. $\frac{1}{4}$ E., five-eighths of a mile distant. This buoy is not properly placed, as there is a *seventeen feet spot* some distance to the northward of it; and vessels in passing the point must give the buoy a berth of an eighth of a mile to the southward.

When past Sands' Point Reef look out on the south side of the channel for the long reef making off from Barker's Point, on the northern end of which will be seen a black spar-buoy, and about four hundred yards to the southeastward of the buoy a red spindle. The *Gangway and Success Rocks* black buoy, which is marked No. 23, is on Gangway Rock, which has six feet at low water and lies at the extreme northwestern end of the reef; and the spindle is on Success Rock, with eight feet, which lies about eight hundred and fifty yards to the northwestward of Barker's Point. It is an iron shaft surmounted by a conical cage, and small vessels may pass between it and the buoy with thirteen feet at low water.

The buoy on Gangway Rock bears from Execution Rocks Light-house SW. by S. $\frac{3}{4}$ S., one mile and a quarter; from Sands' Point Reef buoy SW. $\frac{1}{2}$ W. Westerly, seven-eighths of a mile; and from Sands' Point Light-house W SW., seven-eighths of a mile distant. From this buoy the southern end of Hart Island bears SW. by W. $\frac{3}{4}$ W., one mile and a quarter, and Stepping Stones Light-house $\frac{1}{4}$ S., two miles and three-eighths distant. From the spindle on Success Rock, Stepping Stones Light-house bears SW. $\frac{1}{4}$ W., about two miles and three-eighths distant.

When past the buoy on Gangway Rock the course turns somewhat abruptly to the southward,—the bay being now open,—and vessels of twelve feet draught must give Hewlett's Point a berth to the westward of not less than half a mile to avoid the *shoal water surrounding that point*, which makes off to the eastward for three-eighths of a mile with from seven to eleven feet at low water. There is no buoy on this shoal, and no directions, other than those just mentioned, can be given for avoiding it.

When up with the southern end of Plum Beach you must give the northeastern shore a berth of half a mile to avoid the *flats which fill the cove making in to the eastward of that beach*, and which have from two to six feet water upon them. They are easily avoided by keeping the western shore best aboard.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING MANHASSET BAY.

I. *From the Eastward*.—On the W. by S. $\frac{1}{4}$ S. course through the Sound, when Execution Rocks Light-house bears N. $\frac{1}{2}$ W., three-eighths of a mile, Sands' Point Light-house SE. by S. $\frac{1}{2}$ S., half a mile, and Stepping Stones Light-house SW. $\frac{1}{4}$ S., three miles and three-eighths distant, steer SW. until

you come abreast of the black buoy on Gangway Rock. Now steer **S. by W. $\frac{1}{2}$ W.** towards Hewlett's Point until Throg's Neck Light-house bears **SW.**, when **SE. $\frac{3}{4}$ S.** will lead safely into the bay, where you may anchor at discretion in from ten feet to seven fathoms; but not more than fourteen feet can be carried into the bay across the bar at its entrance.

The above courses pass a quarter of a mile to the southward of the buoy on the southwestern end of Execution Rocks; the same distance to the northward of the black buoy on Sands' Point Reef; three hundred yards to the northward and the same distance to the westward of the black buoy on Gangway Rock; half a mile to the westward of the spindle on Success Rock; the same distance to the eastward of Hewlett's Point; two hundred yards to the westward of the southern extremity of Plum Beach; and four hundred yards to the eastward of Mott's Point.

DANGERS

IN APPROACHING AND ENTERING MANHASSET BAY.

II. From the Westward.—In approaching Hewlett's Point from the westward it should receive a berth to the southward of not less than four hundred yards to avoid Hewlett's Point Reef, which makes off to the northward for about three hundred yards with several bare rocks and rocks awash at low water upon it. It is not buoyed, and in beating vessels may avoid it by not going to the southward of Sands' Point Light-house bearing **NE. $\frac{1}{2}$ E.** on Stepping Stones Light-house **SW. $\frac{1}{4}$ W.**

On passing Hewlett's Point and turning into the harbor vessels of more than twelve feet draught should give that point a berth to the westward of half a mile to avoid *the shoal water making off to the eastward for about three-eighths of a mile* with from ten to eleven feet at low water; but light-draught vessels may pass within three hundred yards of the point with not less than ten feet.

Beyond Hewlett's Point the dangers are the same and are met with in the same order as in approaching the harbor from the eastward.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING MANHASSET BAY.

II. From the Westward.—On the **NE. by N. $\frac{7}{8}$ N.** course from off Throg's Neck, when past The Stepping Stones and in twelve fathoms, with Stepping Stones Light-house bearing **S. $\frac{1}{4}$ W.**, three-eighths of a mile, and Parker's Point **E NE.**, two miles distant, steer for the latter until within eight hundred yards of it and exactly in the middle of the entrance to the bay. Sands' Point Light-house will now bear **NE. $\frac{1}{2}$ N.** and Execution Rocks Light-house **N. by E. $\frac{1}{2}$ E.**, and **SE. $\frac{3}{4}$ S.** will lead safely in, carrying not less than fourteen feet at low tide over the bar. Anchor as above directed.

The above courses pass seven hundred yards to the northward of Stepping Stones Light-house; four hundred yards to the northward of Hewlett's Point Reef; and one hundred and fifty yards to the northward and two hundred yards to the eastward of the shoal east of Hewlett's Point.

TIDES.

Corrected Establishment	11 ^h 13 ^m
Mean Rise and Fall of tides	7.7 ft.
Mean Rise and Fall of Spring tides	8.9 ft.
Mean Rise and Fall of Neap tides	6.4 ft.
Mean duration of Rise	5 ^h 55 ^m
Mean duration of Fall	6 ^h 30 ^m
Mean duration of Stand	0 ^h 14 ^m
Rise of highest tide observed	10.1 ft.

NEW ROCHELLE HARBOR.

This harbor lies on the northern side of the Sound nearly opposite to Manhasset Bay, and is a narrow sheet of shoal water embraced between the northern shores of the Sound and Davenport's Neck. It cannot be entered by strangers owing to the contracted limits of its channel and the many dangers by which the approach to it is obstructed; and its navigation is, therefore, confined almost exclusively to steamers and barges. The entrance, which is between Davenport's Neck on the north and Locust Island on the south, is less than one hundred yards wide; and the village of **New Rochelle** is situated half a mile inland on nearly level very gently sloping land under fine cultivation. Good anchorage is found in from two to five fathoms off the mouth of the harbor, between Davenport's Neck and Davenport's Island; and also, if you have come from the westward, between Davenport's and Locust islands; but this latter anchorage is not recommended to strangers.

The approach from the eastward leads between **Middle Shoal** on the north and Whortleberry Island, about three-eighths of a mile to the southward of it. The former surrounds a small marshy islet, covered at high water, and that portion of it which is bare at low water covers an area three hundred and fifty yards long **N.** and **S.** by two hundred **E.** and **W.** and is strewn with boulders.

Whortleberry Island lies nearly **E.** and **W.**, is about a quarter of a mile long, low and nearly level, with rocky faces and covered with grass. Over its surface are scattered a few lone tall trees, and there is a thin grove of low bushy trees at its southern end. Conspicuous on the northeastern end of the island are two tall trees close together; and a bare rock off its southern end has a single tree upon it. Although bold-to on its eastern and southern sides there is no safe passage between this island and Davenport's Island,—the space between being studded with rocks.

**Whortleberry
Island.**

Between Whortleberry Island and Middle Shoal there is a *dangerous rock with seven feet at low water*, which forms a very serious obstruction to the approaches from the eastward. It is marked, however, by a spar-buoy painted red and black in horizontal stripes.

Three-eighths of a mile to the westward of Whortleberry Island lies Davenport's Island,—its northern end being a quarter of a mile to the southward of Davenport's Neck. It lies nearly **N.** and **S.**, is about nine hundred yards long with an average width of four hundred yards, and when viewed from the eastward appears rocky and thickly wooded, with several houses and a tall flag-staff showing among the trees. A long reef makes off from it to the northward with several rocks upon it awash at low water; and it is not safe, therefore, to approach the northern end of the island nearer than a quarter of a mile.

**Davenport's
Island.**

This island was formerly called **Hewlett's Island**, but is now locally known as **David's Island**.

Between Whortleberry and Davenport's islands the space is so studded with rocks and islets as to render any attempt to pass through without a pilot impossible. There is, however, a narrow channel between Davenport's and Pea islands, through which not less than three fathoms may be taken if the navigator is possessed of a good Coast Survey chart.

Davenport's Neck, which forms the northern side of the entrance to New Rochelle Harbor, lies **NE.** and **SW.** and is about one mile long. It is entirely under cultivation,—the land being somewhat higher than the adjacent shores, but having a very gentle slope. It is fringed alternately with beach and marsh,—the former being strewn with boulders; and its southwestern end, which forms the northern point of entrance to the harbor, is a sandy hillock with a few trees upon it.

Davenport's Neck.

Locust Island, which forms the southern side of the entrance, is composed of marsh and wooded lands alternately, lies **NE.** and **SW.** and is half a mile long. Its northeastern end, which forms the southern point of entrance to the harbor, is a wooded hill of moderate height, with precipitous faces to the eastward; and there are several smaller wooded clumps scattered over the surface of the island. Locust Island is seven hundred yards to the westward of Davenport's Island and lies close in with the mainland,—being in no place more than one hundred and fifty yards from it,—and there is no safe passage inshore of it. Nor is the channel between it and Davenport's Island safe without a pilot,—being obstructed by a bare rock, about two hundred yards long, called **Rocky Island**, which lies four hundred yards to the westward of Davenport's Island and three hundred to the eastward of Locust Island. There is, however, good anchorage between this islet and Davenport's Island in from two to five fathoms; but it is necessary to cross an eight feet bar to reach it.

Locust Island.

When you have passed between Locust Island and Davenport's Neck the harbor terminates in a very narrow and shallow stream, which runs about **NE.** by **N.** for half a mile, where it is crossed by a dam, shutting it off from a mill pond. Not less than twelve feet can be taken into the harbor past Locust Island and up to abreast of the lower wharf; but strangers must not attempt the passage, which is exceedingly narrow and full of shoals.

DANGERS

IN APPROACHING AND ENTERING NEW ROCHELLE HARBOR.

I. From the Eastward, by the Main Channel.—In approaching this harbor from the eastward the first danger met with is *Middle Shoal*, already described above, which lies on the northern side of the entrance. There is, however, a good passage to the northward and westward of this shoal, between it and Pine Island, but it is seldom used.

Nearly in the middle of the entrance—being about two hundred and fifty yards to the northward of Whortleberry Island and one hundred and fifty yards to the southward of the southern extremity of Middle Shoal—lies Middle Rock, the most dangerous of all the obstructions in this approach. It has seven feet on it at low water and covers an area a little over one hundred yards square, with a depth of from three to five fathoms on all sides of it. A spar-buoy painted red and black in horizontal stripes marks the position of this danger.

Middle Rock.

When to the westward of Middle Rock the next danger met with lies on the northern side of the passage and is known as Pine Island Rocks,—a line of rocks, bare at half tide and low water, extending about **SW.** by **S.** from Pine Island for three-eighths of a mile. They are easily avoided, as they always show themselves and there is a bare rock on their southern extremity. Exactly opposite to this southern end and about an eighth of a mile from

**Pine Island
Rocks.**

it is the northern end of *Davenport's Island North Reef*, which makes off from the northern end of that island for nearly four hundred yards and has several bare rocks and rocks awash upon it close to its northern end. The available channel between this reef and Pine Island Rocks is about two hundred yards wide with a depth of from three to six fathoms.

To avoid Davenport's Island North Reef it is necessary to keep the shore of Davenport's Neck aboard after passing Pine Island Rocks. A good rule is to keep about two hundred yards from the shore of the neck.

About four hundred yards **NW.** from the northwestern point of Davenport's Island and two hundred and fifty yards **E. $\frac{1}{2}$ S.** from the southern extremity of Davenport's Neck is a *detached rock, bare at low water* and almost exactly in the middle of the passage. Five fathoms at low water may be carried between it and the shore of the neck and from three to five fathoms between it and Davenport's Island,—the latter channel being the wider of the two. At low water it is easy to avoid this rock; but when covered, especially if the sea be smooth, it is difficult to discover its position. A spindle will be recommended to be placed upon it.

Beyond this rock no intelligible description can be given of the dangers in this passage.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING NEW ROCHELLE HARBOR.

I. From the Eastward, by the Main Channel.—On the **W.** by **S. $\frac{1}{2}$ S.** course through the Sound, when Execution Rocks Light-house bears **W.** by **S. $\frac{1}{8}$ S.**, distant two miles and a quarter, and Sands' Point Light-house **SW.** by **W.**, distant two miles and three-eighths, steer **W. $\frac{3}{4}$ N.**, which course will lead between Middle Shoal and Whortleberry Island, passing to the northward of Middle Rock with not less than three and a half fathoms. On this course, when within one hundred yards of the southernmost of the Pine Island Rocks, with the northwestern point of Davenport's Island bearing **SW. $\frac{3}{8}$ S.**, about seven hundred yards distant, steer **W SW.** and anchor off the mouth of the inlet in from three to five fathoms. If bound into the inlet you must take a pilot, as the channel is extremely narrow.

The above courses pass eight hundred yards to the northward of the buoy on the northern end of Execution Rocks; between three and four hundred yards to the northward of Whortleberry Island; one hundred yards to the northward of Middle Rock; one hundred and fifty yards to the southward of Middle Shoal; fifty yards to the southward of Pine Island Rocks; the same distance to the northward of Davenport's Island North Reef; and the same distance to the southward of the bare rock **E. $\frac{1}{2}$ S.** from the southern extremity of Davenport's Neck.

The passage between Davenport's Island and Pea Island, although it has from three and a half to five fathoms in it, is so narrow and full of rocks as to be entirely unsafe without the assistance of an experienced pilot, and no intelligible directions can be given for it. *That between Pea Island and Hart Island*, however, though very much obstructed by ledges and sunken rocks, affords a comparatively safe channel about three hundred and fifty yards wide by keeping close to the Hart Island shore.

DANGERS

IN APPROACHING AND ENTERING NEW ROCHELLE HARBOR.

II. From the Eastward by the passage East of Hart Island.—This passage is unobstructed until you approach the northern end of Hart Island, when you must look out for the great Middle Reef, which lies nearly midway between Pea Island and Hart Island and covers an area nine hundred yards long **NW.** and **SE.** by seven hundred yards wide. It is for the most part bare at low water, and in several places, especially near its northwestern end, at half tide, and is not buoyed. Where not bare at low water it has soundings over it varying from two to ten feet; and there is no safe passage between it and Pea Island. Its southwestern extremity comes within a quarter of a mile of the northern end of Hart Island, leaving a channel three hundred yards wide with not less than three fathoms at low water between the two. To avoid the reef, therefore, it is necessary to keep the Hart Island shore aboard and under no circumstances to pass it at a greater distance than four hundred yards.

On the western side of the passage you must look out for Hart Island North Reef, which makes in a northwesterly direction from the northern end of that island for nearly a quarter of a mile. Near the northern extremity of this reef and about three hundred and fifty yards from the north end of the island is a group of three bare rocks, known as *Hart Island North Reef*. The *Bolgers* and sometimes *The North Brothers*, which serve to pretty well define the northern limits of the reef. Between *The Bolgers* and the island there are many rocks bare at low water with a depth between them of from five to eight feet.

If beating in do not stand to the westward of the range of the southwestern end of Hunter's Island with the northeastern extremity of Hart Island in order to avoid The Chimney Sweeps. These are a group of three bare rocks and one sunken reef with five feet water lying to the northeastward of High Island,—the bare rocks being distant from that island three hundred yards, and the sunken reef an eighth of a mile to the eastward of the bare rocks and a quarter of a mile to the northeastward of High Island. Between this sunken reef (which is sometimes called the *Eastern Chimney Sweep*) and The Bolgers there is a passage about four hundred yards wide with not less than three fathoms. The bare rocks always show themselves; but the outlying reef is a very dangerous obstruction to the approach to New Rochelle Harbor from the westward. A spar-buoy painted red and black in horizontal stripes is placed on the eastern extremity of this reef.

The Chimney Sweeps.

The **Twins**, which are the two rocky wooded islets off the southeastern end of Hunter's Island, should not be approached from the southeastward nearer than two hundred and fifty yards, as *dangerous shoals with from three to eight feet upon them* make off from the easternmost islet about one hundred and seventy-five yards. There is no buoy.

About seven hundred yards **SW. $\frac{1}{2}$ S.** from the southern end of Davenport's Island, half a mile **E NE.** from the southern extremity of the easternmost of The Twins, and four hundred yards to the northwestward of the dry part of Middle Reef, is a *rock bare at low water* which is a very serious obstruction in this passage. It is, however, bold-to, and is easily avoided by not going to the eastward of the western point of Davenport's Island bearing **N NE.**

There are also *several detached rocks, bare at low water*, lying about one hundred and fifty yards to the eastward of the **Briar Islands**,—a group of three bare rocky islets three hundred yards to the eastward of Hunter's Island and one hundred and fifty yards to the northward of The Twins. To avoid the bare rocks Briar Islands should receive a berth to the westward of not less than three hundred yards.

About two hundred and fifty yards **SW. by S. $\frac{1}{2}$ S.** from Rocky Island and nearly in the middle of the passage between Locust and Davenport's islands is a *rock bare at low water and surrounded by shoals*, to avoid which it is necessary not to go to the westward of the northeastern point of Rocky Island bearing **N. $\frac{3}{4}$ E.** On the other hand it is necessary to give the southwestern shore of Davenport's Island a berth to the eastward of not less than four hundred yards in order to avoid the *shoal which makes off from that shore for three hundred yards with not more than six feet at low water.* By these two shoals the width of the channel is diminished to about two hundred yards with a depth of eight feet at low water; but beyond this it is possible to carry a depth of four fathoms between Rocky and Davenport's islands, but only with the assistance of a competent pilot.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING NEW ROCHELLE HARBOR.

II. From the Eastward by the passage East of Hart Island.—Bring Execution Rocks Lighthouse to bear **NE.** by **E. $\frac{1}{2}$ E.** and steer **SW.** by **W. $\frac{1}{2}$ W.** for the northern extremity of Hart Island until within four hundred yards of the latter and the highest part of the easternmost of The Twins bears **NW.** Now steer that course, carrying not less than four fathoms, until within six hundred and fifty yards of The Twins, with the southern end of High Island bearing **SW. $\frac{1}{2}$ S.** Nearly, and the southeastern extremity of Davenport's Island **NE. $\frac{1}{2}$ N.** Now steer **N.** by **E. $\frac{1}{4}$ E.,** carrying not less than eight feet water, and anchor, between Rocky Island and the southwestern point of Davenport's, in from three to five fathoms at low water. Here, if bound to New Rochelle, you must take a pilot.

The above courses pass over one hundred yards to the westward of the southwestern end of Middle Reef; four hundred yards to the eastward of The Bolgers; a quarter of a mile to the eastward of the Eastern Chimney Sweep; nearly four hundred yards to the eastward of the shoals off The Twins; an eighth of a mile to the westward of the northwestern end of Middle Reef; two hundred yards to the westward of the detached bare rock northwest of that reef; three hundred yards to the eastward of the outlying rocks off the Briar Islands; one hundred yards to the westward of the shoal off the southwestern end of Davenport's Island; and the same distance to the eastward of the rock to the southwestward of Rocky Island.

DANGERS

IN APPROACHING AND ENTERING NEW ROCHELLE HARBOR.

III. From the Westward by the passage between Hart and City Islands.—A description of this approach comprehends also the anchorage on the western side of Hart Island, commonly known as **Hart and City Island Harbor**, which is very frequently used as a harbor of refuge in easterly and

westerly gales. Hart Island, which lies on the eastern side of the approach, extends **N.** by **E.** and **S.** by **W.** for nearly a mile,—its southern end bearing from Sands' Point Light-house **SW.** by **W.** $\frac{3}{4}$ **W.**, two miles and an eighth, and from Execution Rocks Light-house **SW.** Southerly, two miles and three-eighths distant. It is of irregular shape,—being only about thirty yards wide midway between its northern and southern ends, six hundred yards wide just to the northward of this point, two hundred yards wide at its northern and one hundred yards at its southern end. Its surface is nearly level, but highest at its northeastern end, and there are scattered trees here and there. Its southeastern part is level and sandy, with perpendicular faces, behind which appear, when viewed from the southeastward, dark woods. The island terminates at its southern end in a grassy bluff, bare of trees and about twenty feet high; and it is here comparatively bold-to,—five fathoms at low water being found within an eighth of a mile. At its northeastern end are the quarters for the boys of the **Reform School-ship**,—a line of low, flat-roofed, yellowish buildings, appearing from a distance like a train of cars. The southern half of the island is bold-to and may be approached from the westward within one hundred and fifty yards with not less than three and a half fathoms; but the northern half is shoal on its western side and must receive, from vessels drawing more than seventeen feet, a berth to the eastward of not less than six hundred and fifty yards. Vessels drawing twelve feet or less, however, may approach this part of the island within five hundred yards without danger.

City Island is half a mile to the westward of Hart Island, lies nearly **N.** and **S.**, is one mile and a quarter long, of moderate height, somewhat undulating, with steep sandy faces to the southward and eastward, and thickly dotted with houses and groves of trees except at its northern end, which is bare. To the southward it extends into a long, low, level point, on which stands a grove of bushy trees. The water is shoal to the southward and southwestward of the island, and prominent among the shoals is a dangerous rock, known as **Big Tom**, which obstructs the entrance to Pelham Bay and Hutchinson's River.

Vessels of greater draught than twelve feet must keep close to the Hart Island shore to avoid City Island Flats, which make off to the eastward from this island for over half a mile, leaving a passage but little over one hundred and fifty yards wide for vessels drawing more than twelve feet. Small vessels, however, (that is, such as draw less than ten feet,) have an entirely unobstructed passage,—it being only necessary for them not to approach the City Island shore nearer than three hundred and fifty yards.

On the western side of the passage and near the northern end of City Island there makes off to the eastward a long flat with from two to five feet upon it at low water. At its eastern end, seven hundred yards from the City Island shore, there is a bare rock lying nearly **N.** and **S.** and between sixty and seventy yards long, known as **Rat Island**; and about one hundred yards inshore of this there is a marshy flat about one hundred yards in diameter, bare at low water, and known as **Green Flat**. There is no passage between the two, nor between **Green Flat** and **Rat Island**; but the latter is bold-to on its eastern side and may be approached within fifty yards with not less than four fathoms.

On approaching **Rat Island**, if you wish to pass in the best water, you must give the island a berth to the westward of about one hundred and fifty yards, as the Hart Island shore is shoal in this vicinity,—the flats making off from it to the westward for about seven hundred yards. Vessels of ten feet draught or less may, however, approach this part of the Hart Island shore within four hundred yards.

On the western side of the passage and about two hundred yards **E.** by **N.** from the northern end of City Island lies a sandy islet called **High Island**. To the northward, eastward and southward it shows precipitous faces, and its summit has a few houses and scattered trees upon it. Its eastern face may be approached within two hundred yards with not less than seven fathoms; but on its northern side it is shoal,—the bare rocks known as **The Chimney Sweeps** lying about three hundred yards to the northeastward of it. (See page 511.)

A sunken reef with five feet water (marked by a horizontally-striped buoy) lies a little over two hundred yards **E.** by **N.** $\frac{3}{4}$ **N.** from the outermost of **The Chimney Sweeps** and nearly in the middle of the passage,—the eastern end of **High Island** bearing **SW.**, distant six hundred yards, and the northernmost of **The Bolgers** **SE.** by **E.** $\frac{1}{4}$ **E.**, distant a little over a quarter of a mile. The channel passes between this reef and **The Bolgers** with a width of about three hundred yards between the lines of three fathoms.

The Bolgers have been already described on page 510 as a group of three bare rocks lying at the northern end of **Hart Island North Reef** and within three hundred and fifty yards of the northern point of that island. Vessels of ten feet draught or less may approach them within one hundred and fifty yards, but larger vessels must give them a berth to the eastward and southward of not less than an eighth of a mile.

When past **The Bolgers** the dangers are the same and are met with in the same order as when coming in by the passage east of Hart Island. (See page 511.)

As before remarked, strangers should not attempt to enter **New Rochelle Harbor** without a pilot.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING NEW ROCHELLE HARBOR.

III. From the Westward by the passage between Hart and City Islands.—1. *Vessels of greater draught than twelve feet* should bring Stepping Stones Light-house to bear **SW.** by **S.** $\frac{3}{4}$ **S.** and steer **NE.** by **N.** $\frac{3}{4}$ **N.** for the southern end of Hart Island. On this course, when within three hundred yards of the island, with the southern end of City Island bearing **W.** by **S.** $\frac{3}{4}$ **S.**, steer **N.** by **W.** $\frac{1}{4}$ **W.**, heading about for The Chimney Sweeps. This course carries not less than three and a half fathoms, and you may anchor on it anywhere under the Hart Island shore in from three to seven fathoms, soft bottom; but *if bound to New Rochelle*, when exactly abreast of Rat Island, in six and three-quarter fathoms, with the northern extremity of Hart Island bearing **NE.** by **E.** $\frac{3}{4}$ **E.**, steer **N.** $\frac{3}{8}$ **E.** until you come between The Chimney Sweeps and The Bolgers. Here you will have four fathoms,—Execution Rocks Light-house bearing **E.** by **N.** $\frac{3}{4}$ **N.** and the middle of High Island **W.** by **S.** $\frac{3}{4}$ **S.** Now steer **N.** by **E.** $\frac{1}{4}$ **E.**, which will lead with not less than nine feet to the anchorage between Davenport's and Rocky islands. Here you may anchor in from two to five fathoms, or continue your course with not less than three and a half fathoms to the anchorage off the mouth of New Rochelle Harbor.

The above courses pass about twelve hundred yards to the eastward of the southern end of City Island; two hundred yards to the westward of the southern end of Hart Island; one hundred yards to the eastward of the southeastern end of City Island Flats; the same distance to the eastward of the eastern end of those flats; the same distance to the westward of the western extremity of Hart Island Flats; two hundred yards to the eastward of Rat Island; four hundred yards to the eastward of High Island; the same distance to the westward of The Bolgers; three hundred yards to the eastward of The Chimney Sweeps; a little over one hundred yards to the eastward of the sunken reef off The Chimney Sweeps; three hundred yards to the westward of the northwestern end of Middle Reef; four hundred yards to the eastward of The Twins; and a little over one hundred yards to the westward of the shoal off the southwestern side of Davenport's Island.

2. *Small vessels (that is, vessels drawing less than ten feet)* may bring Stepping Stones Light-house to bear **S.** $\frac{3}{8}$ **W.** and steer **N.** $\frac{3}{8}$ **E.**, carrying not less than eleven feet at mean low water, until they come abreast of The Chimney Sweeps, between them and The Bolgers. Here there will be four fathoms, with Execution Rocks Light-house bearing **E.** by **N.** $\frac{3}{4}$ **N.** and the middle of High Island **W.** by **S.** $\frac{3}{4}$ **S.** Now the course is **N.** by **E.** $\frac{1}{4}$ **E.**, following the directions given above.

The **N.** $\frac{3}{8}$ **E.** course crosses City Island Flats in not less than eleven feet at low water and you may anchor on the flats according to your draught; but it is best for vessels simply seeking a shelter to haul to the eastward and anchor under the Hart Island shore, where is deeper water and better holding-ground.

3. *It may also be remarked, in this connection, that vessels from the Eastward* may reach the anchorage between Hart and City islands by obeying the following directions: On the **SW.** course from off Sands' Point, bring Stepping Stones Light-house to bear **SW.** by **S.** $\frac{1}{2}$ **S.** and the southern end of City Island **W.** $\frac{1}{2}$ **S.**,—the latter being distant three-quarters of a mile,—and steer **N.** by **W.** $\frac{1}{2}$ **W.**, which will lead with not less than three and a half fathoms into the harbor. Anchor at discretion, after passing the southern end of Hart Island, in from three to seven fathoms at low water.

TIDES IN NEW ROCHELLE HARBOR.

Corrected Establishment.....	11 ^h 21 ^m
Mean Rise and Fall of tides.....	7.6 ft.
Mean Rise and Fall of Spring tides.....	8.5 ft.
Mean Rise and Fall of Neap tides.....	7.0 ft.
Mean duration of Rise.....	5 ^h 51 ^m
Mean duration of Fall.....	6 ^h 34 ^m
Mean duration of Stand.....	0 ^h 15 ^m
Rise of highest tide observed.....	9.0 ft.

LITTLE NECK BAY.

This is a large but shallow bay on the southern side of the Sound, and is contained between Great Neck on the east and the Flushing shore on the west. It is two miles and a quarter long, but of little importance, as it affords anchorage for very small vessels only. Five feet at low water is the best that can be taken into it beyond Willet's Point. The entrance, between Elm Point on the east and Willet's Point on the west, is seven-eighths of a mile wide; and this width the bay keeps for a little over

one mile, or until you come abreast of the northern end of Little Neck, after which it gradually contracts until it terminates at its head in two very narrow and shallow streams.

Elm Point, the eastern point of entrance, is the western extremity of Great Neck. It is steep, bluff and sandy, thinly covered with woods, and has a large white house near the water, and a long wharf extending from it upon which is a warehouse. The dangerous reef known as **The Stepping Stones** extends from it to the northwestward for three-quarters of a mile, and has a light-house known as **Stepping Stones Light-house** on its extremity. This light-house is a one-story dwelling supported on a granite pier and surmounted by a lantern showing a fixed red light, of the fifth order, visible ten miles. Its geographical position is

Latitude ----- 40° 49' 25" N.
Longitude ----- 73° 46' 12" W.,

and it bears from Execution Rocks Light-house **SW. $\frac{1}{4}$ S.**, three miles and five-eighths, and from Sands' Point Light-house **SW. $\frac{1}{4}$ W. Westerly**, three miles and a quarter distant. From this light-house Throg's Neck Light-house bears **SW. Southerly**, one mile and a quarter distant.

The **fog-signal** is a bell struck by machinery, in quick succession, at intervals of twenty seconds.

Willet's Point, the western point of entrance to the bay, is a high, steep, grassy bluff, having a terraced appearance owing to the large earthwork which occupies its crest and northern slopes. At the foot of the bluff is an unfinished fortification of granite, with the following warning to mariners posted conspicuously on its walls: "**Torpedoes in channel; don't anchor.**" This point is also the southern point of entrance to the East River.

The eastern shore of Little Neck Bay is, as before remarked, formed by the western side of Great Neck, and appears as a somewhat undulating country, but low, with very gentle slopes, for the most part under cultivation and thickly settled, with occasional handsome groves of trees. One mile and three-quarters to the southward of Elm Point makes **Great Neck**, in **Little Bay**, between three and four hundred yards wide at its mouth, but almost entirely bare at low water and occupied by grass. **Little Neck**, which lies on its western side, is low, flat and level near its northern end and for about seven hundred yards to the southward; after which it has a very gentle rise to a height of about forty feet, with occasional groves of trees on its eastern slopes. It is almost entirely under cultivation and thickly settled.

The Flushing shore, which forms the western side of Little Neck Bay, is of moderate height, (somewhat higher than the **Great Neck** shore,) and is composed almost entirely of a highly cultivated and well-settled country dotted with groves of trees.

At its head the bay terminates in a narrow slue six hundred yards long which leads up to a drawbridge.

DANGERS

IN APPROACHING AND ENTERING LITTLE NECK BAY.

I. From the Eastward.—As this bay is only available for vessels of six feet draught and less the only danger in approaching it from this direction is *The Stepping Stones*, which have been described above, and which are marked by the light-house on their northern end. When past this light-house there are no dangers.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING LITTLE NECK BAY.

I. From the Eastward.—When on the **SW. by S. $\frac{1}{4}$ S.** course towards Throg's Neck you come abreast of Stepping Stones Light-house, having it bearing **SE. by E. $\frac{1}{4}$ E.**, about three hundred yards distant, steer **S. $\frac{1}{4}$ E.**, which will lead safely into the bay, where you may anchor to the southward of Willet's Point in from five to six feet at low water; or, in easterly winds, you may anchor under Elm Point in from ten to fourteen feet water.

The above courses pass three hundred yards to the northward and two hundred and fifty yards to the westward of Stepping Stones Light-house; half a mile to the westward of Elm Point; and between six and seven hundred yards to the eastward of Willet's Point.

DANGERS

IN APPROACHING AND ENTERING LITTLE NECK BAY.

II. From the Westward.—Having come through the East River from New York and intending to anchor in Little Neck Bay you will meet with but one obstruction, viz: Throg's Neck Shoal, which makes off from the point of that name to the southeastward for about two hundred yards and is marked by a red spar-buoy (No. 32) placed in three fathoms. Such vessels as are of sufficiently light draught as to be able to anchor in Little Neck Bay may, however, pass fifty yards to the northward of this buoy with not less than eleven feet at low water.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING LITTLE NECK BAY.

II. *From the Westward.*—Bring Throg's Neck Light-house to bear **NW.** $\frac{1}{2}$ **W.** and steer **SE.** $\frac{1}{2}$ **E.** until in the middle of the entrance to the bay, with Willet's Point bearing **W.** by **N.** $\frac{1}{2}$ **N.**, distant half a mile. Stepping Stones Light-house will now bear **N.** $\frac{3}{4}$ **W.** and **S.** $\frac{3}{4}$ **E.** will lead safely to the anchorage.

The above courses pass four hundred yards to the northward and between six and seven hundred yards to the eastward of Willet's Point.

PELHAM BAY AND HUTCHINSON'S RIVER.

Pelham Bay lies on the northern side of the Sound, at its western end, and the entrance to it is between City Island on the north and Throg's Neck on the south. Between these two points it is nearly two miles wide, but gradually contracts in width until, between Pelham Neck and Schuylerville, it is but five-eighths of a mile wide; and at its head, where empties Hutchinson's River, it is but six hundred yards wide. Neither the bay nor the river is fit for any but the smallest vessels,—five feet at low water being the best that can be taken above Pelham Point, the southern extremity of Pelham Neck. It is, therefore, but seldom used, and should never under any circumstances be entered by strangers.

City Island, the northern point of entrance to the bay, has been already described on pages 373–374, and its southern end extends into a long, low, level point, on which is a grove of bushy trees.

Throg's Neck, the southern point of entrance, is also the northern point of entrance to the East River and is easily recognized by the large granite fort and light-house on its extremity. The fort is called **Fort Schuyler** and the light-house **Throg's Neck Light-house**. The neck is a long projection of level grassy land, almost entirely occupied by the large earthworks and buildings connected with the fort. The light-house bears from Execution Rocks Light-house **SW.** $\frac{3}{4}$ **S.**, nearly five miles, and from Stepping Stones Light-house **SW. Southerly**, one mile and a quarter distant. During thick weather a bell is struck by machinery at intervals of fifteen seconds.

Pelham Neck, formerly called **Rodman's Neck**, is a peninsula about one mile and a quarter long in a **N.** by **E.** and **S.** by **W.** direction and rises with a very gentle slope to a height of about sixty feet above sea level. When viewed from the southward it shows cultivated fields dotted with houses, and its southern shore is fringed with marsh and rocks. Between this neck and the northern end of City Island is a channel an eighth of a mile wide with twelve feet at low water, which leads to the entrance to **Morris' Cove**, contained between this neck and Hunter's Island; but this passage is not safe for strangers however light their draught. (See also page 374.)

On the western shore of the bay, about five-eighths of a mile to the northward of Throg's Neck Light-house, is **Locust Point**, a projection of low level land, partly wooded but mostly marsh; and one mile and three-eighths to the northward of this is the village of **Schuylerville**, situated on low, somewhat undulating but nearly level lands, under fine cultivation and well settled.

Hutchinson's River is a very narrow and shallow stream, which leads through a narrow and tortuous channel from Pelham Bay to **East Chester**, about two miles and a quarter above its mouth. Its shore-line is mostly low and marshy, but is in places fringed with rocks and everywhere backed by a nearly level country, highly cultivated and thickly settled. Between six and seven hundred yards above its mouth its channel is nearly closed by three rocky islets; and here crosses a bridge or causeway which effectually closes all farther navigation. Above the bridge the river rapidly contracts in width and long before it reaches East Chester has become a mere brook.

DANGERS

IN APPROACHING AND ENTERING PELHAM BAY.

The only danger met with in approaching Pelham Bay is **Big Tom**, a bare rock on City Island Shoal, surrounded by sunken rocks with from four to nine feet water upon them. City Island Shoal, which extends in a **WSW.** direction from the southern end of City Island, is marked by a red spar-buoy (No. 30) placed in fifteen feet off its western end, and being two hundred yards to the southward of Big Tom it serves as a guide for avoiding that danger also. This buoy bears from Throg's Neck Light-house **N.** by **E.**, distant one mile and a half, and from Stepping Stones Light-house **NW.**, distant three-quarters of a mile.

City Island Shoal.

A little over three-quarters of a mile **NW.** from this buoy and about half a mile **SSW.** from Pelham Point lies a rock bare at half tide, which forms the southern end of a long shoal or middle ground dividing the approach to Hutchinson's River into two channels. As there is, however, not less than five feet on this middle ground, and not more than that depth can be taken into the river, vessels pay no attention to it further than to give the bare rock a sufficient berth either to the eastward or westward.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING PELHAM BAY.

I. *From the Eastward.*—Bring Stepping Stones Light-house to bear **SE.** by **E.** $\frac{1}{4}$ **E.** and steer **NW.** by **W.** $\frac{1}{4}$ **W.** Anchor on this course in from seven to nine feet; or, when Throg's Neck Light-house bears **S.** $\frac{3}{4}$ **E.** steer **N.** $\frac{3}{4}$ **W.** for the entrance to Hutchinson's River.

The above courses pass a quarter of a mile to the southward of the red buoy on City Island Shoal and six hundred yards to the westward of Big Tom.

II. *From the Westward.*—Round Throg's Neck at a distance of two hundred yards from the buoy and steer **NE.** by **N.** $\frac{1}{4}$ **N.** towards Stepping Stones Light-house for about three-eighths of a mile, or until the eastern extremity of Willet's Point bears **SW.** by **S.** $\frac{7}{8}$ **S.**, when steer **NW.** by **N.** $\frac{1}{4}$ **N.** until past Locust Point and Throg's Neck Light-house bears **S.** $\frac{3}{4}$ **E.** Now steer **N.** $\frac{3}{4}$ **W.**, following the directions given above.

The above courses pass two hundred yards to the southward and the same distance to the eastward of the red buoy on Throg's Neck Shoal; a quarter of a mile to the eastward of Locust Point; seven-eighths of a mile to the westward of Stepping Stones Light-house; half a mile to the westward of the red buoy on City Island Shoal; and the same distance to the westward of Big Tom.

Or, you may round Throg's Neck, giving the buoy a berth to the northward of two hundred yards and the light-house a berth to the westward of four hundred yards, and steer to the northward until the latter bears **S.** $\frac{3}{4}$ **E.**, which will be off Locust Point. Now steer **N.** $\frac{3}{4}$ **W.**, which will lead safely with not less than five feet to the mouth of Hutchinson's River.

Pelham Bay, as before remarked, is seldom used, as it is only fit for the smallest vessels, and even these cannot depend upon more than five feet at mean low water. The bay should never be attempted by strangers, as much better anchorage and shelter is found in Hart and City Island Harbor, between Hart and City islands, or on the southern side of the Sound in Manhasset Bay.

TIDES.

Corrected Establishment at Throg's Neck	11 ^h 20 ^m
Mean Rise and Fall of tides	7.3 ft.
Mean Rise and Fall of Spring tides	9.2 ft.
Mean Rise and Fall of Neap tides	6.1 ft.
Mean duration of Rise	5 ^h 50 ^m
Mean duration of Fall	6 ^h 33 ^m
Mean duration of Stand	0 ^h 43 ^m
Rise of highest tide observed	11.7 ft.

CURRENTS IN LONG ISLAND SOUND.

Observations for the direction and velocity of the tidal current in this great thoroughfare were made, during the years 1845-48, by Lieuts. Comdg. Chas. H. Davis and Jno. R. Goldsborough, U. S. N., Assistants in the Coast Survey; and these observations were thoroughly discussed by Assistant Chas. A. Schott, U. S. Coast Survey, in his report to the Superintendent, April, 1854. (See Coast Survey Report, 1854, pp. 168-179.) At that time, however, although the importance of accurate observations of currents was well recognized, comparatively few attempts at systematized work had been made previously to its initiation by the Coast Survey. The instruments for measuring the drift were, of course, comparatively rude; and the observations necessarily not so reliable as those made at the present day with the improved and delicate modern appliances. The strength of the flow of the current given in the table below must therefore be taken as nearly but not absolutely correct; while the "set" or direction of the flow is sufficiently close to accuracy for all practical purposes. The experience of the compiler, during a sojourn of two successive seasons in the Sound, leads to the belief that the drift as set forth in the table is usually underrated; and, until more complete observations shall have been made, it may be taken as a safe rule that the velocity of the current at its strength is *never less* than as laid down in the table and is frequently *greater*. Notably is this the case in Plum Gut, (Station No. 14,) where the velocity of the current of flood is given in the table as 1.8 knots and that of ebb at 2.5 knots, whereas a single observation in August, 1874, gave for velocity of flood 2.5 knots and for ebb 4.5 knots. No boat could pull in the gut against the strength of the ebb current of spring tides.

As given in the table the *direction* of the stream is, in all cases, magnetic, and the *drift* in nautical miles per hour.

The table was constructed under the direction of the Superintendent of the Coast Survey from the results of Assistant Schott's careful and exhaustive discussion of the field observations, and will, it is hoped, meet a want long felt. It will be noticed that at the inshore stations the current turns from flood to ebb much earlier than at the stations in the channel.—a fact the knowledge of which will enable a vessel in beating to take advantage of a favorable "set" by keeping inshore or in the channel-way, according to circumstances.

CURRENT TABLE.

No.	STATIONS. Locality.	Strength of Flood Current.		Strength of Ebb Current.		Current turns from Flood to Ebb before or after Moon's Transit.
		Set.	Drift.	Set.	Drift.	
1	Two miles and an eighth NE. $\frac{1}{4}$ N. from the northern end of Block Island North Reef.	N. $\frac{1}{2}$ W.	1.6	E. by N.	2.8	0 18 before.
2	Between Montauk Point and Block Island	NW. $\frac{1}{4}$ N.	1.3	SE. by S.	2.4	0 44 "
3	Two miles SE. of Watch Hill Point	W. $\frac{1}{4}$ N.	1.2	SE. $\frac{1}{2}$ E.	1.1	0 44 "
4	Two miles E SE. from Montauk Point	N. $\frac{1}{4}$ W.	2.1	S. by E. $\frac{1}{4}$ E.	2.1	0 22 "
5	Two miles N. from Montauk Point	NW. $\frac{1}{4}$ N.	2.0	SE. $\frac{1}{2}$ S.	1.9	2 1 "
6	One mile and a half NE. by N. $\frac{1}{4}$ N. from Cerberus Shoal	W. by N. $\frac{1}{2}$ N.	1.4	E. $\frac{1}{4}$ S.	1.9	0 46 "
7	Off Fort Pond Bay	W. $\frac{1}{4}$ N.	0.8	E. by N. $\frac{1}{4}$ N.	1.0	2 7 "
8	In The Race	W. by N. $\frac{1}{4}$ N.	4.7	SE. $\frac{1}{2}$ E.	4.5	0 20 after.
9	Off New London Entrance	W. $\frac{1}{4}$ S.	1.0	E NE.	1.3	1 43 before.
10	Two miles and a half to the eastward of Gardiner's Point	NW.	1.6	E SE.	1.9	0 58 "
11	Between Plum Island and Great Gull Island	NW. $\frac{1}{4}$ N.	2.1	SE. by E. $\frac{1}{4}$ E.	2.8	0 15 "
12	A quarter of a mile to the eastward of Bartlett's Reef Light-vessel.	W. by N. $\frac{1}{4}$ N.	2.0	E. $\frac{1}{4}$ S.	2.0	2 0 "
13	Between Plum Island Point and Black Point	W. $\frac{1}{2}$ S.	2.6	E. by N.	2.7	0 45 "
14	In Plum Gut	W. $\frac{1}{4}$ N.	1.8	SE. by E. $\frac{1}{4}$ E.	2.5	1 56 "
15	Off the mouth of Connecticut River	W. $\frac{1}{4}$ N.	1.8	E. by S. $\frac{1}{4}$ S.	1.7	1 57 "
16	Two miles to the southward of Cornfield Point Light-vessel.	SW. by W. $\frac{1}{4}$ W.	1.4	NE. by E. $\frac{1}{4}$ E.	2.0	0 0 "
17	In the North Channel, between Cornfield Point and Long Sand Shoal.	W. by N. $\frac{1}{4}$ N.	1.5	E. by S. $\frac{1}{2}$ S.	1.5	1 49 before.
18	One mile and five-eighths to the westward of the western end of Long Sand Shoal.	NW. by W. $\frac{1}{4}$ W.	1.4	E. by S. $\frac{1}{4}$ S.	1.6	0 9 after.
19	Three and a half miles E SE. from Falkner's Island Light-house.	W. $\frac{1}{4}$ N.	1.2	SE. by E. $\frac{1}{4}$ E.	1.5	0 55 before.
20	Five miles N. of Friar's Head	W. by N. $\frac{1}{4}$ N.	1.9	E SE.	2.0	0 38 "
21	Two miles S. of Branford Reef	W. $\frac{1}{4}$ S.	0.6	E. by N.	0.8	0 8 "
22	Two miles and three-quarters SW. by S. $\frac{1}{4}$ S. from Southwest Ledge Light-house.	NW. $\frac{1}{4}$ W.	1.5	E. $\frac{1}{4}$ N.	1.5	1 2 "
23	One mile and a half SE. $\frac{1}{4}$ E. from Middle Ground Light-house.	W.	1.9	E. $\frac{1}{2}$ N.	2.2	0 20 after.
24	One mile and three-quarters N NE. from Middle Ground Light-house.	W. by S. $\frac{1}{4}$ S.	1.2	E. $\frac{1}{4}$ N.	1.3	0 47 "
25	Between Old Field Point and The Middle Ground	SW. $\frac{1}{4}$ S.	1.4	NE. by E. $\frac{1}{4}$ E.	1.5	0 55 "
26	Two miles W. by N. $\frac{1}{4}$ N. from Middle Ground Light-house	W. by S. $\frac{1}{4}$ S.	1.0	E. by N. $\frac{1}{4}$ N.	0.8	0 49 "
27	Three miles and an eighth N NE. from Eaton's Neck Light-house.	W. $\frac{1}{2}$ S.	1.2	E. by N. $\frac{1}{4}$ N.	1.2	0 6 before.
28	Off Huntington Bay	SW. $\frac{1}{4}$ W.	1.3	E. $\frac{1}{2}$ N.	1.1	0 0 "
29	Off Oyster Bay	SW. $\frac{1}{4}$ W.	0.6	NE. by E. $\frac{1}{4}$ E.	0.6	0 12 before.
30	One mile and a half S SE. from Great Captain's Island Light-house.	SW. by W. $\frac{1}{4}$ W.	0.6	NE. $\frac{1}{4}$ N.	0.7	1 48 after.
31	One mile and seven-eighths S. by E. $\frac{1}{4}$ E. from Rye Point	SW. by S.	0.6	NE. $\frac{1}{4}$ N.	0.9	0 44 "
32	One mile E NE. from Execution Rocks	SW. by S.	0.5	NE. $\frac{1}{2}$ E.	1.0	0 42 "
33	Main Channel, between Execution Rocks and Sands' Point.	S SW.	0.5	NE. $\frac{1}{2}$ E.	0.9	0 46 "
34	Northern Passage, between Execution Rocks and Whorleberry Island.	SW. by S.	0.7	NE. $\frac{1}{4}$ N.	1.0	4 0 before.

ICE IN LONG ISLAND SOUND AND ADJACENT HARBORS.

In ordinary winters the floating and pack ice in this Sound, while impeding navigation, does not render it absolutely unsafe. But in severe winters, like that of 1874-5, the reverse is the case,—none but powerful steamers being able to make their way. As an example, the experience of 1874-5 may be cited. During that winter ice caused more general obstruction and delay in the movements of vessels of all classes than in any other locality west of the Gulf of Maine.

The first large formation extended along the southern shore of the Sound from Eaton's Neck to Throg's Neck and was composed of partly local and partly drift-ice. The latter (formed originally along the northern shore of the Sound) was driven across to the southern side and accumulated there,—massing into large fields and remaining until removed by southerly winds, when it would drift back to the northern shore, and increased continually in area until the whole Sound was covered; and where forced upon the shore it measured from three to twelve feet in thickness.

In the western part of the Sound these formations began to interfere with navigation about the middle of January, 1875, and thence until the 23d of March they rendered the movements of sailing vessels very uncertain and dangerous, and between February 5th and March 10th altogether impossible. From February 5th to February 23d none but powerful steamers could be forced through the ice; and between the 16th and 23d even these, with one exception, were obliged either to go outside of Long Island or discontinue their trips altogether,—the whole Sound being completely covered with heavy ice extending through The Race and as far to the eastward as Point Judith and Block Island, and outside of Montauk Point to a distance varying from five to fifteen miles from land.

New London Harbor.—The Thames River is rarely obstructed by ice above the light-house. In severe winters, however, the pack extends about one mile and three-quarters above the light-house. Between New London and the mouth of the river

sailing vessels may navigate with comparative safety in ordinary winters; and even in severe weather there is rarely a stoppage of navigation of more than a week's duration. Steamers can nearly always enter and leave with safety. Drift-ice forms a decidedly dangerous obstruction in the approaches through Long Island Sound during severe winters, especially during February and March; and sailing vessels are much hindered in their movements during the months of January, February and March.

Above New London there are rarely any obstructions.

New Haven Harbor.—During severe winters the accumulation of ice is local and begins to obstruct the movements of sailing vessels about the middle of January. From that date until the latter part of March it bars the ingress or egress of sailing vessels without the assistance of tug-boats. Except in extraordinarily severe weather, however, steamers can always enter and leave the harbor without much difficulty.

Bridgeport Harbor.—In severe winters this harbor is completely closed to all navigation unless a channel is cut through "the pack" by ice-boats. Sailing vessels cannot enter the harbor without assistance between January 15th and February 10th, under ordinary circumstances; but in such winters as that of 1874-75 navigation is closed to such vessels until the tenth of March.

Effect of Tides, Winds, &c., on the Ice in the Sound and the above Harbors.—In Long Island Sound northerly winds drive the ice to the southern shore of the Sound and southerly winds carry it back to the northern shore. Northeasterly winds force the ice to the westward, and cause formations heavy enough to prevent the passage of vessels of every description until the ice is removed by westerly winds. These winds carry the ice to the eastward; and if of long enough duration drive it through The Race into Block Island Sound, whence it goes to sea and disappears.

The same rule as that which applies to Nantucket and Vineyard sounds—in regard to vessels keeping close to the northern shores during northerly winds—will also apply to the movements of steamers in Long Island Sound; but is not a safe one for sailing vessels to follow, as a shift of wind to the southward would be liable to place them in a very critical situation,—there being no safe harbors of refuge into which they could make their way.

The Race may be said to be the only locality where tidal currents have any decided influence on the movements of the ice. Large quantities of "floe" ice usually pass through The Race during the ebb, especially if the wind be westerly; and in severe winters this ice causes serious obstructions in Block Island Sound and around Montauk Point. These obstructions are the most extensive about the middle of February.

Navigators must not depend too implicitly upon the light-vessels and buoys. In severe winters these are liable to be carried away; and in fact during every winter it is better to go by the ranges of the lights and other permanent objects than by the buoys. In New London Harbor winds from **E.** around by the northward to **W.** remove all drift-ice from the approaches to the Thames River; while those from **E SE.** by the southward to **W SW.** carry the ice away. The buoys in the river are not usually disturbed; but Bartlett's Reef Light-vessel is sometimes drifted from position off the mouth of the harbor and may in extreme cases remain so for several days.

In New Haven Harbor the influence of the northerly winds is to clear the harbor and its approaches unless the local formation is too heavy to be moved. Southerly winds force the drift-ice in from the Sound and prevent the local formations from leaving the harbor. Tides have little effect upon the ice.

In Bridgeport Harbor winds from **N.** to **NW.** clear the harbor of drift-ice; and those from **SE.** by southward to **SW.** force the ice into the harbor from the Sound. The outer buoys are apt to be carried out of position and the jetty damaged by heavy ice during severe winters; but the range of the beacon with the chimneys in East Bridgeport will never be disturbed.

EAST RIVER

is the name universally given to the narrow strait which connects Long Island Sound with New York Bay and separates Long Island from Manhattan Island, on which is built the city of New York. At its eastern end the river is about five-eighths of a mile wide between Throg's Neck and Willet's Point, and thence it flows to the westward and southwestward for about fourteen miles,—being in many places extremely narrow, and in no place more than a mile wide. Its channel is much obstructed by rocks and islands and the current runs with great velocity, especially in the narrow passage between Ward's Island and Hallett's Point, commonly known as Hell Gate. Strangers cannot pass through Hell Gate without a pilot, and indeed it is advisable for all sailing vessels to avail themselves of the services of a tug in passing through.

Throg's Neck, the northern point of the eastern entrance, has already been described on page 369, and is easily recognized by the large granite fort and light-house on its extremity. The fort is known as **Fort Schuyler**, and the light-house, which stands about one hundred yards to the northeastward of it, as **Throg's Neck Light-house**. The latter is painted white and shows a fixed white light, of the fifth order, visible eleven miles. It bears from

	Miles.
Execution Rocks Light-house, SW. $\frac{1}{2}$ S.	nearly 5
Great Captain's Island Light-house, SW.	nearly 13
Sands' Point Light-house, SW. $\frac{1}{2}$ W.	4 $\frac{1}{2}$
Stepping Stones Light-house, SW. Southerly	1 $\frac{1}{2}$

From this light-house the eastern extremity of Willet's Point bears **SE. $\frac{1}{2}$ S.**, about seven-eighths of a mile, and the light-house on The Brothers **W. $\frac{1}{2}$ N.**, five miles distant.

A bell is struck by machinery at intervals of fifteen seconds during thick weather.

Willet's Point, the southern point of entrance, has already been described on page 369, and is also easily recognized by the unfinished granite fort at the base of the bluff close to the edge of the water. On its wall is conspicuously posted a notice—"Torpedoes in channel; don't anchor." Between this point and Throg's Neck the channel is three-eighths of a mile wide between the lines of three fathoms and has from six to twenty fathoms in it.

On the northern shore of the river, about one mile and three-quarters **W.** by **N.** from the southern end of Throg's Neck, is Old Ferry Point; and between the two the curve of the shore forms a wide cove, called **Laing's Cove**, where it is possible to anchor in from three to six fathoms out of the strength of the current; but care must be exercised not to stand too far into the bight, as the water shoals abruptly from three fathoms to five feet. The shores of this **Old Ferry Point** cove are all low and for the most part thickly wooded, but showing occasionally cleared fields and houses. Old Ferry Point, however, is a long, low, level, grassy neck, with groves of ornamental trees and handsome houses in the back-ground. It is nearly opposite but a little to the westward of **Whitestone Point**, on the southern shore. It is bold-to and may be approached within two hundred yards with not less than seven fathoms water.

On the southern shore of the river and on the western side of **Willet's Point** makes in a semicircular cove, about five-eighths of a mile in diameter, called **Willet's Cove**, which affords excellent anchorage for small craft in from five to six feet at low water. Its shores present a beautiful appearance in summer,—being nearly level and diversified with handsome trees and cultivated fields dotted with houses. In fact the whole southern shore of the river from **Willet's Point** to **Hunter's Point** (where the city of Brooklyn begins) is thickly settled,—being occupied at intervals by villages and in the more open country by numerous handsome villas surrounded by ornamental grounds.

Nearly two miles to the westward of **Willet's Point** is **Whitestone Point**, a bluff thickly wooded point with steep face, off which there are outlying rocks,—one of them much resembling a boat in appearance. Just back of the point is the village of **Whitestone**, standing amid beautifully cultivated fields. The small semicircular cove on its western side is known as **Rose Cove**, but is of no importance,—having only two or three feet in it at low water. At **Whitestone Point** is the **Telegraph Station** of the *New York Herald*, whence all outward and inward bound vessels are daily reported to that newspaper.

About one mile and a half to the westward of **Whitestone Point** and about five-eighths of a mile to the westward of **Rose Cove** is **College Point**, the eastern point of entrance to **Flushing Bay**. It has steep grassy faces and gently sloping surface, covered with a thin growth of tall trees. There is a shoal off it, marked by a black buoy, and vessels must be careful not to pass inside the buoy, or, if it be gone, not to approach the point nearer than six hundred yards. When the first point to the southward of **College Point** bears **S SW.** you are to the westward of the shoal, and if intending to pass through the **South Channel** you may approach the point within three hundred and fifty yards. The channel of the river divides at this point,—the main passage leading to the northward and the other to the southward of **Riker's Island**. No stranger should, however, attempt the latter.

On the northern shore of the river, three-quarters of a mile to the westward of **Old Ferry Point**, is **Clason's Point**; and between the two is the mouth of **Westchester Creek**, a narrow and shallow stream leading up to the town of **Westchester**. **Clason's Point** is low and nearly level and is occupied by ornamental grounds surrounding a large and handsome house. On its western side it runs up into a steep bluff twenty feet high and crowned with a thick growth of large trees. Vessels should not approach the point nearer than four hundred yards.

Three-quarters of a mile to the westward of **Clason's Point** is **Hunt's Point**, now usually known as **Spofford's Point**; and between the two is the entrance to the **Bronx River**, a very shallow stream, which leads between the towns of **Westchester** and **West Farms** and as far up as **East Chester**. It is not, however, navigable even for small vessels except at high water, and for the greater part of its length is a mere brook. All of the shore on both banks of the river is low, level, grassy, under high cultivation, and dotted with groves of trees and handsome houses.

Hunt's Point, or **Spofford's Point**, is also low, level and grassy, and is occupied by ornamental grounds surrounding a handsome house. Here there is a long wharf making out from the western side of the point into the small cove between it and **Leggett's**, or **Barretto's Point** as it is now generally called. This point is nearly half a mile to the westward of **Spofford's**; but the cove between them, called **Barretto's Cove**, has not more than one or two feet in it at low water. It appears low, level and grassy, and is occupied by ornamental grounds dotted with trees and surrounding a handsome villa. Off this point lies **Riker's Island**,—the passage between them being about a quarter of a mile wide with from six to twelve fathoms at low water.

Flushing Bay, on the southern shore of the river, makes in between **College Point** on the east and **Bowery Bay Point** on the west,—being one mile and three-eighths wide between the two. It penetrates the northern shore of **Long Island** in a **SSE.** direction for one mile and a half, where it receives the waters of a small, narrow, shallow creek called **Flushing Creek**, which leads up to the town of **Flushing** and to **Newtown Landing**. The bay affords good anchorage in from four to ten feet at low water and is entirely unobstructed, so that it is a very common resort for small vessels. **College Point**, its eastern point of entrance, has been already described. **Bowery Bay Point**, which is one mile and three-eighths **SW.** by **W.** from it and nearly three-quarters of a mile **SSE.** from **Riker's Island**, is nearly level, dotted with groves of ornamental trees and handsome houses. Its northern end is terraced and turfed and has somewhat the appearance of an earthwork.

The village of **Strattonport** is situated on the eastern shore of the bay, about half a mile below College Point, and extends along the shore to the southward for about one mile; while the western shore shows a highly cultivated country, somewhat undulating, thickly dotted with houses and here and there groves and occasional lone trees.

The town of **Flushing** is situated about five-eighths of a mile to the southward of Strattonport, on the east bank of Flushing Creek and about a quarter of a mile above its mouth. Here the creek is crossed by a drawbridge, and again, about half a mile farther up, by another bridge carrying the Flushing Railroad, by which the town is connected with Brooklyn.

On the western side of Bowery Bay Point the shore makes a curve to the southward and westward, forming what is known as **Bowery Bay** and formerly the **Poor Men's Bowery**. It is of little importance,—having but three or four feet in it at low water,—but is often used by small vessels.

About three-eighths of a mile to the northwestward of this bay and close in with the shore lies a small island known as **Berrian's Island**. It is about eight hundred yards long **N.** and **S.**, smooth, grassy and gently sloping, and had in 1875 three trees upon it,—one at its eastern end and two in the middle. There is no passage inshore of it; but the South Channel passes on its eastern side between it and **Riker's Island**. Vessels using this channel must not approach the southern end of Berrian's Island nearer than six hundred yards; but from its middle to its northern end it may be approached within two hundred yards with not less than four fathoms.

Riker's Island, which separates the Main and South channels, lies nearly in the middle of the river,—being a quarter of a mile to the southward of Barretto's Point and five-eighths of a mile to the northward of Bowery Bay Point. It is five eighths of a mile long **N.** and **S.** with an average width of about four hundred yards, and is remarkable for the very peculiar rocks upon its summit, which have a castellated appearance. With this exception the island is smooth, grassy and nearly level, having a very gentle slope, dotted here and there with a few lone trees. It is surrounded by dangerous shoals extending to the eastward over one mile and to the westward half a mile; while its northern end may be safely approached within one hundred and fifty yards with not less than five fathoms and its southern end within an eighth of a mile with not less than seven fathoms.

To the westward of Riker's Island lie **The Brothers**. They are known as the North and South Brother and are about two hundred yards apart in a direction nearly **N.** and **S.** **The North Brother**, which is easily recognized by the light-house on its southwestern end, is five-eighths of a mile to the westward of Barretto's Point and half a mile to the northward of the northern end of Riker's Island. It is a quarter of a mile long **NE.** by **N.** and **SW.** by **S.** and is low, level and covered with a scattered growth of handsome trees. There is a low house near its eastern end and a large brown house near the middle of the island. The light-house is a one-story frame dwelling with mansard roof, from the centre of which rises a low tower. The building is painted a light drab with brown trimmings, and shows a white fixed light, of the sixth order, from a height of fifty feet above the sea, visible eleven miles. Its geographical position is

Latitude ----- 40° 47' 58" N.
Longitude ----- 73° 53' 54" W.,

and it bears from Throg's Neck Light-house **W. ½ N.**, five miles; from Whitestone Point **W. ¼ N.**, three miles and five-eighths; and from the northern end of Riker's Island **W. by N. Northerly**, half a mile distant. From this light-house Stony Point bears **W. ¼ S.**, half a mile; The Middle Ground buoy **SW. by W. ½ W.**, three-quarters of a mile; and the entrance to Hell Gate **SW.** by **W.**, one mile and a half distant.

The South Brother is also low, level and grassy, has a few bushy trees upon it and one old house near the middle of the island. It is nearly circular, about three hundred yards in diameter, and was readily known in 1875 by a tall, dead, branchless tree near its northern end. This northern end bears from the northern end of Riker's Island **W.**, distant eight hundred yards.

The channel between The Brothers is only about one hundred yards wide with a depth of four fathoms; but the deepest channel, which passes on the northern side of The North Brother, is in no place less than two hundred yards wide between the lines of three fathoms, is entirely unobstructed, and from ten to twelve fathoms may be taken through it. It is not possible to pass between Riker's Island and The South Brother on account of the many dangerous sunken rocks forming part of **Riker's Island West Flats**.

From Barretto's Point to Stony Point the distance is one mile and a quarter, and the northern shore of the river takes a sweep to the northward and then to the westward and southwestward, thus forming a large bight or bay, through which the Main Channel passes. The strength of the current is not great here,—being under ordinary circumstances not more than a knot and a half per hour. The shore between Barretto's Point and Stony Point is nearly all low and level, highly cultivated and thickly dotted with houses.

Stony Point is low and level, almost entirely grassy, and has a house and a long low wharf near its southern end. There is a flag-staff near the house and a few lone trees are seen here and there near the shore-line. Just back of the point, standing amid beautiful ornamental grounds, is the old homestead of the Morris family, from which the small settlement known as **Port Morris** and the town of **Morrisania**, one mile and a half to the northward, take their names. The point is bold to and may be approached within one hundred yards with ten fathoms at low water. A railway connects Port Morris with Morrisania and thence with New York.

A narrow passage about one hundred yards wide leads between Stony Point and **Randall's Island** into the Harlem River: but not more than three feet at low water can be taken through it, and it is, of course, unfit for strangers.

channel on both sides of it, although that on its western side is the deepest. Though long it is quite narrow,—having an average width of about two hundred and fifty yards,—and on its northeastern end, which is a level grassy point, faced with a granite sea wall, will be seen a tall tower of grey stone surmounted by a lantern painted and **Blackwell's Island** gilded, and this again crowned with a spire, weathercock and pointers. This is **Blackwell's Island Light- and Light-house**. house, maintained by the city of New York, and showing a fixed red light, of the fourth order of Fresnel, from a height of fifty-four feet above high water, visible thirteen miles. It stands upon made ground, where was formerly the reef known as **Bread and Cheese Reef**, and it is usual for vessels to pass to the westward of it, that is, between **Blackwell's Island** and New York. Those which pass to the eastward of the island will carry not less than five fathoms past the village of **Ravenswood** (which adjoins Astoria and is situated amid beautiful gardens and highly ornamental grounds) and will finally reach **Hunter's Point**, a settlement on the west bank about two miles and an eighth below Astoria.

Hunter's Point is the northern point of entrance to a narrow stream about one hundred and fifty yards wide, on the southern side of which begins the city of **Brooklyn**. This stream is called **Newtown Creek**, and flows in a southeasterly direction for about two miles,—being crossed in that short distance by no less than four draw-bridges.

Abreast of **Hunter's Point** the river is about three-quarters of a mile wide with a depth in the channel of from three to eight fathoms, and it now turns to the southward, running about **S. by W. $\frac{1}{2}$ W.** for one mile and three-quarters to abreast of **Wallabout Bay**, where the **Brooklyn Navy Yard** is situated. Here it is only about seven hundred yards wide with a depth in the channel of from six to ten fathoms; and it now turns about **W. by S. $\frac{1}{2}$ S.** for two miles and a quarter, joining the **Upper Bay** of New York between **The Battery** on the north and **Red Hook** on the south,—**Governor's Island** lying about midway between the two points.

In **Wallabout Bay** lies the **U. S. Cob Dock**, constructed on a shoal or sand bar opposite to the **Navy Yard**, and having a channel in no place less than one hundred yards wide between it and the **Brooklyn** shore. Through this channel eleven feet at low water may be taken, and at its western end is the **Navy Anchorage**, with from four to six fathoms.

The Battery is a level grassy park, thickly dotted with trees and faced with a granite sea wall. At its northwestern end is a circular wooden building surmounted by a cupola, and now used as a depot for immigrants. It was formerly the **Round Battery** and gave the name to the point, but is now called **Castle Garden**. **The Battery** is quite bold-to and may be approached safely within one hundred yards with not less than four fathoms.

Red Hook, the southern point of the western entrance to **East River**, is also the western extremity of the city of **Brooklyn**. It is low and level and occupied entirely by houses, docks and ship-yards. On its southern side makes in a large shallow cove called **Gowanus Bay**, and to the northward of it, between it and **Governor's Island**, is what is known as **Buttermilk Channel**, which is a quarter of a mile wide from shore to shore and in no place less than two hundred yards wide between the lines of three fathoms. This a very commonly used channel and has not less than five fathoms in it at low water. **Red Hook.**

Governor's Island, which lies in the middle of the western entrance to the **East River**, is about eight hundred yards long **NW.** and **SE.** and a quarter of a mile wide. It is very nearly level and occupied entirely by **Fort Columbus** and the fortifications and their out-buildings, belonging to the United States. On the extreme northwestern point of the island, facing the **North River**, is a low, circular, stone fort, on which there is a **fog-signal**, consisting of a bell struck by machinery twice in quick succession, at intervals of twenty seconds. There are many buildings on the **Governor's Island**, island surrounding the fortifications, and prominent among these will be seen a long, low, brick house with its roof covered with gravel. Also, upon the eastern and southeastern sides of the island groves of low trees are seen, among which appear several dwelling houses, which are the quarters of the army officers stationed on the island. On the extreme southern end of the island is a water battery facing the **Buttermilk Channel** and easily recognized as an oblong work of stone, whitewashed, and surmounted by traverses of earth.

The **Main Channel** of the **East River** passes to the northward of **Governor's Island**, between it and **The Battery**, which also forms the eastern point of entrance to the **Hudson** or **North River**; but there is equally good water through **Buttermilk Channel**, and this latter is frequently used by vessels bound through the river to the eastward.

Governor's Island is shoal on its western side and should not be approached from that direction nearer than half a mile.

DANGERS

IN PASSING FROM LONG ISLAND SOUND THROUGH EAST RIVER INTO NEW YORK BAY.

On approaching **Throg's Neck** a red spar-buoy will be seen off the point. This is on **Throg's Neck Shoal**, which makes off to the southeastward for about two hundred yards. The buoy is placed in ninety feet, is marked No. 32, and bears from **Stepping Stones Light-house SW. $\frac{1}{2}$ S.**, distant one mile and three-eighths. From this buoy the black buoy on **College Point Reef** bears **W. $\frac{1}{2}$ N.**, distant two miles and seven-eighths. **Throg's Neck Shoal.**

Vessels should not approach the point nearer than a quarter of a mile should the buoy be gone. **Whitestone Point** may be approached within an eighth of a mile and **Old Ferry Point** within one hundred yards with not less than eight fathoms at low water; but, if standing to the northward on a wind, you should not proceed farther into the bight between **Throg's Neck** and **Old Ferry Point**

than to bring Throg's Neck Light-house to bear **E. $\frac{1}{2}$ S.** or Old Ferry Point **W. $\frac{1}{2}$ N.**, unless the vessel be of light draught, when she may stand into four fathoms with safety. The flats are very abrupt.

Between Whitestone Point and College Point do not stand to the southward of Throg's Neck Light-house bearing **E.** on account of *the shoal water off Rose Cove*. When off this cove a black spar-buoy will be seen ahead, bearing about **W. $\frac{1}{4}$ S.** and three-quarters of a mile off.

College Point Reef. This is on College Point Reef, which makes off to the northeastward for a quarter of a mile and has six feet on its northern end close to the buoy. The buoy is marked No. 1, placed in three fathoms, and bears from Old Ferry Point **W. by S. $\frac{3}{8}$ S.**, one mile; from Throg's Neck Light-house **W. Southerly**, two miles and three-quarters; and from Whitestone Point **W. $\frac{1}{4}$ N.**, nearly one mile and a half distant. From this buoy the north end of Riker's Island bears **W. $\frac{3}{4}$ N.**, one mile and five-eighths, and North Brother Light-house **W. $\frac{1}{8}$ N.**, nearly two miles and a quarter distant.

Between Clason's Point and Hunt's or Spofford's Point, on the north side of the river, you should not stand farther to the northward than to bring North Brother Light-house to bear **W. $\frac{3}{4}$ N.** on account of *the shoals off the mouth of Bronx River*; and on the south side, after passing College Point Reef buoy, you must beware of Riker's Island East Flats, which extend from that island to the eastward about one mile and an eighth and have from four to eight feet water upon them. They are not buoyed, but may be avoided by not going to the southward of a line joining College Point and the northern end of the island,—the former bearing **E. by S. $\frac{1}{2}$ S.** and the latter **W. by N. $\frac{1}{2}$ N.** A judicious use of the lead will, however, enable you to stand farther to the southward,—going about as soon as you strike four fathoms. A buoy will be recommended to be placed on the eastern end of these flats, about three-eighths of a mile to the westward of College Point.

Riker's Island East Flats. This is on South Brother North Reef, which has from two to six feet water upon it and extends to the northward from The South Brother for about one hundred and fifty yards, leaving a passage about one hundred yards wide between the buoy and The North Brother. Narrow as this channel is it is frequently used by steamers, and even by sailing vessels when wind and tide are fair, although the Main Channel, to the northward of The North Brother, has from ten to fifteen fathoms in it and is entirely unobstructed. The former channel is, however, more direct, and is therefore frequently used under the above conditions.

Barretto's Point on the north and Riker's Island on the south side of the river may be approached within two hundred yards with not less than four fathoms; but when abreast of the latter a black spar-buoy (No. 3) will be seen a little to the southward of the course and to the southeastward of North Brother Light-house, bearing about **W. by S.** and three-eighths of a mile off.

South Brother North Reef. This is on South Brother North Reef, which has from two to six feet water upon it and extends to the northward from The South Brother for about one hundred and fifty yards, leaving a passage about one hundred yards wide between the buoy and The North Brother. Narrow as this channel is it is frequently used by steamers, and even by sailing vessels when wind and tide are fair, although the Main Channel, to the northward of The North Brother, has from ten to fifteen fathoms in it and is entirely unobstructed. The former channel is, however, more direct, and is therefore frequently used under the above conditions.

There is no passage between The South Brother and Riker's Island,—the area between the two being occupied for the most part by Riker's Island West Flats and *South Brother South Reef*. The former has a depth of two feet; and the latter, which extends to the southward from The South Brother for about six hundred yards, is bare in some places at low water and in others has from five to eleven feet upon it. A narrow sluiceway with fourteen feet leads between the two shoals; but it is not navigable,—not being marked in any way.

When past The North Brother the channel turns to the southwestward and you may approach Stony Point within one hundred yards with not less than eight fathoms; but on the south side, off Lawrence's Point, you will see three spar-buoys—two black and one red and black—lying nearly **E.** and **W.** from each other. The easternmost, which is marked No. 5, is on the northern end of Lawrence's Point Ledge, which makes off from that point to the north-eastward for nearly six hundred yards, is bare in places at low water and in others has from two to eight feet upon it. The buoy is in sixteen feet and bears from North Brother Light-house **SW. $\frac{1}{2}$ S.**, eight hundred yards; from the north end of Riker's Island **W. by S. $\frac{1}{4}$ S.**, a little over three-quarters of a mile; and from Lawrence's Point **NE. by E. $\frac{3}{4}$ E.**, six hundred yards distant. It is sometimes called "Flushing Bay Buoy," and its principal use is to mark the western side of the entrance to that bay from the westward.

Three hundred and fifty yards to the westward of the above-mentioned buoy and three hundred yards to the northeastward of Lawrence's Point is another black buoy, marked No. 7. This is on the northern end of Lawrence's Point Ledge and is placed in nineteen feet, rocky bottom,—North Brother Light-house bearing **NE. $\frac{1}{2}$ E.** and Lawrence's Point **SW.** A quarter of a mile to the westward of this buoy and three hundred yards **NW.** from Lawrence's Point will be seen a spar-buoy painted red and black in horizontal stripes. This is on The Middle Ground, a twelve feet shoal, lying nearly midway between Sunken Meadow and Lawrence's Point,—being two hundred yards from the former and about three hundred yards from the latter. This shoal lies nearly **NE.** and **SW.** and is about three hundred yards long between the lines of three fathoms. Soundings of twelve feet are found at intervals along its length, with deeper water between them; and the buoy is so placed on the middle of the shoal that by giving

Lawrence's Point Ledge. eastern end of Lawrence's Point Ledge, which makes off from that point to the north-eastward for nearly six hundred yards, is bare in places at low water and in others has from two to eight feet upon it. The buoy is in sixteen feet and bears from North Brother Light-house **SW. $\frac{1}{2}$ S.**, eight hundred yards; from the north end of Riker's Island **W. by S. $\frac{1}{4}$ S.**, a little over three-quarters of a mile; and from Lawrence's Point **NE. by E. $\frac{3}{4}$ E.**, six hundred yards distant. It is sometimes called "Flushing Bay Buoy," and its principal use is to mark the western side of the entrance to that bay from the westward.

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it a berth of one hundred yards either to the eastward or westward vessels will pass safely in from twelve to fifteen fathoms at low water. The buoy bears from North Brother Light-house SW. by W. $\frac{1}{2}$ W., distant three-quarters of a mile.

Sunken Meadow is quite bold-to and may be approached by the largest vessels within fifty yards; but if you have passed to the southeastward of The Middle Ground you should give Woolsey's Dock (about two hundred and fifty yards below Lawrence's Point) a berth of not less than one hundred yards to avoid a shoal with from six to twelve feet upon it, which makes off to the northward from the dock for sixty yards. It is commonly known as *Woolsey's Ledge* and is not buoyed.

When past The Middle Ground there are no dangers in the channel until Hell Gate is reached, where, between Ward's Island and Hallet's Point, there are many shoals and rocks, which, in connection with the conflicting currents which meet at this point, render its navigation exceedingly dangerous. The U. S. Engineers are and have been for years engaged in removing these obstructions by blasting and dredging, and it is expected that in the course of a few years the channel will be comparatively free. Pot Rock, one of the most dangerous of all the obstructions, lying about midway between Negro Point and Astoria, has been entirely removed, and there is now a depth of twenty-one feet at low water upon it. *Way's Reef*, one hundred and fifty yards to the southwestward of Pot Rock and the same distance from the Astoria shore, has now twenty-six feet at low water upon it; and the dangerous *Hallet's Point Reef*, which made off in a NNE. direction from that point, has been entirely removed,—thus materially diminishing the force of the dangerous whirls off that point. There still remain, however, a great number of dangerous shoals,—the first one met with being known as *Shelldrake Rock*, about one hundred and twenty yards from the Astoria shore and surrounded by depths of from five to seven fathoms. This rock lies nearly NNE. and SSW., is about forty yards long, and the least water upon it is seventeen feet. It is not buoyed, but is easily avoided by not going to the southwestward of the centre of Great Mill Rock bearing about WNW.

Pot Rock.

*Shelldrake
Rock.*

On the northeastern side of the channel the next danger met with lies close in with the Ward's Island shore, about sixty yards from it, and consists of a mass of shoal ground surrounding two bare rocks lying NW. and SE. from each other and one hundred yards apart. They are called respectively *The Hog's Back* and *Holmes' Rock*,—the latter being the southeasternmost. The reef extends to the southwestward from *The Hog's Back* for one hundred yards with from one to four feet upon it; in the same direction from *Holmes' Rock* for a little over one hundred yards with from one to twelve feet; and eighty-five yards to the southward from *Holmes' Rock*, having not less than ten feet; while between the two reefs a depth of from two to eight feet at low water is found. No portion of this shoal is buoyed; but that off *Holmes' Rock* is easily avoided by giving the rock a berth to the northward of one hundred and fifty yards.

*The Hog's
Back.*

There is a narrow but deep channel, in no place less than thirty yards wide and having a depth of from five to seven fathoms, leading between Ward's Island on the northeast and *The Hog's Back* and *Holmes' Rock* on the southwest; but it is rarely used and is entirely unfit for strangers.

Nearly two hundred yards to the southwestward of *The Hog's Back* and a little over three hundred yards NE. $\frac{3}{4}$ N. from Hallet's Point is *The Frying Pan*, a piece of shoal ground covering an area about fifty yards in diameter and having eleven feet water on its shoalest part. It is not buoyed or marked in any way, and the current of both flood and ebb set directly towards it, so that it is necessary to keep the Hallet's Point shore aboard in order to avoid it. Formerly this course was dangerous, owing to the existence of Hallet's Point Reef; but since the destruction of the latter the Eastern channel, which passes around this point, is nearly as safe as the Main Channel, and will become equally so when Flood Rock and *The Gridiron* have been built up.

The Frying Pan.

When past *The Frying Pan*, if bound through the Main Channel, the course leads to the northward, between Ward's Island and Great Mill Rock; and here you must beware not only of the reefs surrounding the latter, but also of several dangerous sunken rocks with from ten to twelve feet water which lie almost exactly in the middle of the channel, to the northward of Great Mill Rock, at distances from it varying from one hundred and twenty to one hundred and fifty yards.

Heel-tap Rock.

The shoalest as well as the northernmost of these rocks is called *Heel-tap Rock*, and bears from Great Mill Rock N. by E. $\frac{1}{4}$ E., one hundred and fifty yards, and from *The Hog's Back* W. by N. $\frac{1}{4}$ N., six hundred and fifty yards distant. It has ten feet at low water, and you must keep either the Mill Rock or the Ward's Island shore aboard in order to avoid it. Eighty yards SE. $\frac{1}{2}$ E. from it is a sunken rock with twelve feet, and thirty yards SW. $\frac{1}{2}$ S. from it is another with eleven feet. These rocks are all surrounded by deep water (from four to five fathoms) and there are consequently dangerous whirls in their vicinity.

In keeping the Mill Rock shore aboard give it a berth of one hundred yards to the southwestward in order to avoid the reefs which surround it. These reefs with less than ten feet water extend to the eastward about sixty yards, to the southwestward one hundred and twenty yards, and to the westward fifty yards, and are bare at low water on the eastern and southern sides of the rock forty yards from shore. You may, however, if bound through the Main Channel, pass fifty yards to the northward of Great Mill Rock in six fathoms at low water.

Continuing to the southwestward through the Main Channel, Little Mill Rock must receive a berth to the eastward of fifty yards on account of the shoals which surround it, and which extend with not more than six feet water to the northward forty yards, to the westward twenty yards, and to the southward twenty yards. There are dangerous whirls over the southeastern part of this reef which render the Middle Channel (passing between Little Mill Rock and Middle Reef) very dangerous; and this difficulty, added to the set of the ebb on to The Negro Heads, causes this channel to be seldom used.

In endeavoring to avoid Little Mill Rock be careful also not to get too close to Rylander's Reef, which makes off from the New York shore in an easterly direction for a little over one hundred and fifty yards with from four to six feet at low water. There are very dangerous whirls on this shoal, and its eastern end should be buoyed for the guidance of navigators. Such action will be recommended.

If passing through the Middle Channel or the Eastern Channel, Middle Reef is a very dangerous obstruction. It is a large area of shoal ground extending NE. and SW. for about three hundred yards, and with an offset projecting to the northwestward for over one hundred yards from the main body of the shoal. Over this large area are scattered many bare rocks and islets,—prominent among which are, beginning at the northward, the *Little Negro Head*, *Great Negro Head*,

Middle Reef. *The Hen and Chicken, Flood Rock and The Gridiron.* Over the area between these bare rocks the soundings vary greatly,—the bottom being in some places bare at low water and in others having from two to twelve feet over it. The largest of the bare rocks is Flood Rock, on the southeastern side of the reef. It is forty yards long NE. and SW. and only about ten yards wide in its natural state, but is rapidly being enlarged and joined to The Gridiron (fifty yards to the northeastward of it) by the dumping of loose rock dredged from Hallet's Point Reef and vicinity, which is intended to form the foundation for the necessary workshops, &c., when the work on the reef shall have been recommenced.

The Little Negro Head marks the northwestern end of Middle Reef and Flood Rock its southwestern end. The northeastern end should be marked by a buoy placed in not less than three fathoms, with Hallet's Point bearing SE. $\frac{3}{4}$ E., distant about two hundred and fifty yards. Such action will be recommended.

When past Middle Reef there are no dangers in either channel until you approach the southern end of Blackwell's Island, where you must look out for Blackwell's Island Reef, a line of detached ledges extending SW. $\frac{1}{4}$ S. from the southwestern end of the island for three-quarters of a mile with deep water between them. Most of these ledges are bare at low water,—the one nearest the island being out at half tide; and the sunken ledges have from ten to eleven feet at low water. The innermost ledge begins about one hundred yards from the southwestern end of the island and covers an area an eighth of a mile long by one hundred yards wide, leaving a narrow channel between it and the island with three fathoms at low water. Close to its southern end (about one hundred yards off)

Blackwell's Isl- and Reef. is a sunken rock with eleven feet at low water; and an eighth of a mile to the westward of this and seven hundred yards from the southern end of the island is a rock bare at low water. Two hundred yards to the southwestward of this is another rock bare at low water and marked by a black spar-buoy (No. 3). Between this rock and the one above mentioned there is not less than four fathoms at low water by keeping close to the latter. Three hundred yards to the southwestward of the black buoy and half a mile W. by N. $\frac{3}{4}$ N. from the entrance to Newtown Creek is another detached rock with ten feet at low water, marked by a black spar-buoy (No. 1). This is the southernmost end of the reef, and the buoy is three-quarters of a mile SW. $\frac{1}{4}$ S. from the southern end of Blackwell's Island. Vessels using the Main Channel pass to the westward of this buoy, giving it usually a berth to the eastward of not less than one hundred and fifty yards. From this buoy the striped buoy on Easby's Rock and the red buoy on Shell Reef (off Ninth street) bear S. $\frac{3}{4}$ W., distant, respectively, five-eighths of a mile and one mile and an eighth.

The channel is now clear until you approach Nineteenth street, when you will see a spar-buoy painted red and black in horizontal stripes a little to the westward of the course. This is on Easby's or Nes' Rock, a fourteen feet spot about two hundred yards from the end of the Nineteenth street pier. The buoy is placed on the rock, and a channel one hundred and fifty yards wide exists between the rock and the New York wharf-line; but the Main Channel passes to the eastward of the buoy, between it and the Brooklyn shore, and is a third of a mile wide.

Half a mile to the southward of Easby's Rock buoy and off the foot of Ninth street will be seen a red spar-buoy (No. 4) with a cage on top, about three hundred and fifty yards from the New York shore. This is on Shell Reef, a long shoal lying N. and S., a little over a quarter of a mile long, and having from ten to seventeen feet water upon it. The buoy is placed on the eastern side of the shoal (which extends from abreast of the foot of Thirteenth street to abreast of the foot of Seventh street) and must be left to the westward by large vessels.

Between Stony Point and Lawrence's Point the East River is nine hundred yards wide, but the available channel is diminished to three-eighths of a mile by **Lawrence's Point Ledge**, which makes off to the northeastward from Lawrence's Point and is marked by two black spar-buoys. Lawrence's Point is low, level and grassy, and **Lawrence's Point** had in 1875 four Lombardy poplars upon it and here and there clumps of trees. There are several villas and handsome houses seen just back of the point and surrounded by ornamental grounds; and these features belong to all of the Long Island shore from Lawrence's Point to Brooklyn.

At Lawrence's Point the river turns abruptly and runs about **SW.** for one mile and a quarter to the entrance to Hell Gate,—the city of **New York** occupying its western bank. The entrance to the Gate from the eastward is between Negro Point (the southern point of **Ward's Island**) and Hallet's Point, (the northern point of the peninsula on which Astoria is built.) When past the Gate the river continues to the southwestward for two miles and an eighth to Hunter's Point, the northern point of entrance to Newtown Creek. The channel, however, is much obstructed by islands, which render it tortuous, and by confining the volume of water within very narrow limits so increase the velocity of the current as to render its navigation extremely dangerous. Of these islands the first met with is **Randall's Island**, lying in the mouth of the Harlem River, just to westward of Stony Point, and dividing the approach to that river into two channels. The eastern passage, described above, passes between Stony Point and this island and carries but three feet at low water; and the western or Main Channel, which passes between the island and New York, is about two hundred yards wide and carries not less than sixteen feet at low water up to the High Bridge.

One mile and five-eighths to the southwestward of Lawrence's Point and about three hundred and seventy-five yards **S. $\frac{1}{2}$ W.** from Negro Point-Bluff is a large projecting ledge known as **Scaly Rock**, which extends off nearly to the edge of the deep-water channel and is easily recognized. An eighth of a mile to the southwestward of this rock and directly opposite to Negro Point (on **Ward's Island**) is a long wharf, off which lie a number of rocks, bare at low tide and surrounded by shoal water, to which the name of **Cram's Bank** has been given. **Randall's Island** lies nearly **N. and S.**, is **Randall's Island** half a mile long, widest at its southern end, where it is about eleven hundred yards wide, and but four hundred yards wide at its northern end. It is composed of low level land, laid out as ornamental grounds and occupied by many large brown buildings, some of which have spherical domes. These are municipal buildings belonging to the city of New York, and are devoted to the purposes of charity and correction.

Just to the southward of **Randall's Island** and separated from it by a channel but little over one hundred yards wide lies a marsh island about four hundred and fifty yards long **NE. and SW.** and between two and three hundred yards wide. It is called **Sunken Meadow**, and is surrounded by shoals, which render it dangerous of **Sunken Meadow** approach except on its southern side, where you may come within one hundred yards of it with not less than ten fathoms. The passage between **Sunken Meadow** and **Randall's Island** leads into Little Hell Gate, but being obstructed at its western end by the shoals between **The Hammock** and **Sunken Meadow** is dangerous and is not good for more than six feet at low water.

Next to the southwestward of **Randall's Island** is **Ward's Island**, lying nearly **NE. and SW.** and a little over half a mile in diameter. The land is somewhat higher than **Randall's Island**, but is likewise occupied by large public buildings, prominent among which is a brick building, faced with grey stone, surmounted by a mansard roof, and crowned with several pinnacles. Near the southern end are the **Military Hospital** and the **Soldiers' Home**,—the latter a **Ward's Island** large brick building surmounted by a mansard cupola. There are large willows near the southeastern end of the island; and the southwestern end, known as **Negro Point**, is fringed with low trees. **Negro Point Bluff**, which has steep faces about twenty feet high, and whose summit rises to a height of forty feet, is about midway between the southeastern and southwestern ends of the island.

The passage between **Ward's** and **Randall's** islands is called Little Hell Gate, and is in no place less than one hundred and fifty yards wide. It is, however, so much obstructed by sunken rocks that it is not safe for more than five feet without an experienced pilot; and indeed the passage is very seldom used. A small rocky islet called **Little Hell Gate**. **The Hammock** lies about seventy-five yards from the southern shore of **Randall's Island** and one hundred and fifty yards to the northwestward of **Sunken Meadow**. It is surrounded by shoals and must receive a berth to the northward of not less than one hundred yards.

The channel takes an abrupt turn to the northwestward on the south side of **Ward's Island**, rounds **Hallet's Point** (as the northern extremity of the peninsula on which the town of Astoria is built is called) and then turns again to the southwestward,—thus forming the crooked and dangerous passage known as Hell Gate. This passage, which is not less than a quarter of a mile wide between **Ward's Island** and **Hallet's Point**, and about four hundred and fifty yards wide between **Horn's Hook** (on the **New York** side) and the **Astoria** shore, is much obstructed by rocky islets, **Hell Gate** upon which the tidal current strikes with great force, and being deflected therefrom forms numerous eddies and whirls very dangerous to navigation. The operations of the United States Engineers have, however, of late years considerably improved the navigation of the Gate; and the recent destruction of **Hallet's Point Reef**, in July, 1876, has very materially improved the channel and diminished the force of the eddies, so that the Eastern Channel, which was formerly considered very dangerous except with the wind to the northward or westward, is now very frequently used and with comparative safety.

From **Lawrence's Point** the course of the shore is about **SW. by W.** for one mile and a quarter to the peninsula occupied by **Astoria**. The land is nearly level and occupied exclusively by beautifully ornamented grounds dotted with houses and hand-

some groves of trees. The small indentation on the eastern side, and at the southern end of Astoria, is called **Pot Cove**, and affords anchorage in from three to seven fathoms for wind-bound vessels.

Hallet's Point is low and flat and is almost entirely occupied by **Fort Stevens**. At present (1880) the point is easily recognized by the dredge boats, work-shops and other appliances in use by the Engineers in their work of improving the channel. The town of **Astoria** occupies the whole of the peninsula back of the point.

Horn's Hook, on the western side of the river, is quite bold-to, and may be approached within less than one hundred yards with not less than five fathoms at low water. The shore is thickly settled and cut up into streets and squares,—being in fact part of the city of New York.

Harlem River makes in to the northeastward, between **Ward's Point** (the western extremity of Ward's Island) and the New York shore, and is about three hundred and fifty yards wide at its mouth, but soon diminishes to about two hundred yards, which width it keeps, with occasional variations, to its junction with **Spuytten Duyvel Creek**, at the northern end of **Manhattan Island**. The channel (though at the present writing it has not less than fourteen feet in it) is so narrow and crooked as to be available only for steamboats with experienced local pilots on board; and no description of it, or sailing directions for it, could be made intelligible for strangers. The United States Engineers have, however, been engaged for several years in deepening and widening the channel by means of excavations and blasting; and the time is not, probably, far distant when the river will be cleared of obstructions as far up as the **High Bridge**.

Between Ward's Island and Horn's Hook the **East River**, owing to the influx of the Harlem, spreads out to a width of half a mile; but the middle of this area is occupied by a number of bare rocks and rocky islets, which very much obstruct navigation by causing dangerous whirls and eddies. Of these bare rocks the northernmost and largest is known as **Great Mill Rock**, or **Table Rock**, and is an islet about sixty yards in diameter. It consists of a mass of bare rock lying four hundred yards **SW. $\frac{1}{2}$ S.** from Ward's Point and nearly a quarter of a mile **NW. $\frac{1}{2}$ N.** from Hallet's Point. It is surrounded by shoals and must not be approached from the southward nearer than one hundred and fifty yards; but on its northern side you may come within forty yards of it with not less than four fathoms. The Main Channel through the Gate, as well as that leading to Harlem River, passes to the northward of this island.

One hundred and fifty yards **SW. $\frac{1}{2}$ S.** from Great Mill Rock lies **Little Mill Rock**, twenty yards in diameter. Four fathoms may be carried between the two, but the passage is not safe owing to the dangerous whirls.

About one hundred and fifty yards **S. by E.** from Little Mill Rock lie **The Negro Heads**, thirty yards apart, and surrounded by shoals. They lie nearly **WNW.** and **ESE.** from each other and are very small,—being scarcely more than twenty feet in diameter. The northernmost rock is called **Little Negro Head**, and between it and Little Mill Rock flows the Middle Channel of the Gate, seventy yards wide between the lines of three fathoms.

To the southward of The Negro Heads lies Middle Reef,—the shoal extending in a nearly **NE.** and **SW.** direction for three hundred yards and having bare rocks and rocky islets scattered along its length. Of these, the southernmost is **The Hen and Chicken**, a couple of bare rocks lying one hundred yards **S. by E. $\frac{1}{2}$ E.** from the southernmost of The Negro Heads and surrounded by shoal water. Next to the eastward of these, bearing about **E. $\frac{1}{2}$ S.** and forty yards off, is **Flood Rock**, a rocky islet forty yards long **NE. $\frac{1}{2}$ E.** and **SW. $\frac{1}{2}$ W.**, which forms one of the most dangerous obstructions to the Gate. The United States Engineers have been for some time engaged in tunneling under this rock for the purpose of removing it by blasting, as in the case of Hallet's Point Reef; and it is expected that a depth of twenty-six feet at low water over it will ultimately be obtained. Flood Rock bears from Hallet's Point about **W.**, distant three hundred and fifty yards. The Eastern Channel of the Gate, passing between the rock and Astoria, is one hundred and fifty yards wide between the lines of three fathoms, and from eight to twelve fathoms may be taken through it.

It is probable that in the course of time all of the smaller rocks obstructing the Gate will be removed by blasting.

On the western side of the Astoria peninsula excellent anchorage is found in what is known as **Hallet's Cove**, where vessels are free from the effects of the current and may lie at anchor in from two to five fathoms, muddy bottom.

Hallet's Cove. Large vessels (that is, those drawing more than eighteen feet) must beware of **Hallet's Middle Ground**, which has from eleven to eighteen feet upon it and lies almost exactly in the middle of the cove. Vessels bound to New York will anchor under the southern side of the Astoria peninsula and will therefore pass to the northward of the Middle Ground; while those bound from New York to the eastward will pass to the southward of the shoal,—anchoring under the Ravenswood shore.

About four hundred yards to the southwestward of **Thorburn's Dock** (the southern point of entrance to Hallet's Cove) and nearly opposite to the **Lunatic Asylum Dock**, (on Blackwell's Island,) is **Gibbs' Point**, at the northeastern end of the village of Ravenswood. There is a conspicuous white house a little over one hundred yards back from the point, which is used by the pilots as a range with the northeast point of Blackwell's Island in coming through the Main Channel from the eastward. Large vessels should give the point a berth to the southeastward of one hundred yards to avoid the shoal making off from it; but vessels of less than twelve feet draught may approach it within fifty yards with safety.

When fairly in the Gate, abreast of Hallet's Point, the most prominent object visible to the southwestward is Blackwell's Island, which is almost entirely occupied by the state and county buildings, most of which are of granite and present a very imposing appearance. This island, which lies exactly in mid-river, extends **NE.** and **SW.** for one mile and a half with a deep

On the Brooklyn side there is a dangerous shoal, known as The Middle Ground, extending **NE.** $\frac{1}{2}$ **N.** and **SW.** $\frac{1}{2}$ **S.** for about eight hundred yards, with a depth of nine feet at low water nearly midway of its length and eleven feet at its southwestern end. Its northeastern end bears **E.** from the northwestern end of Governor's Island, distant fourteen hundred yards, and is about three hundred yards from the Brooklyn wharf-line. Its southwestern end is six hundred yards **E.** by **N.** from the southern end of Governor's Island and an eighth of a mile from the Brooklyn wharf-line, which is here the width of the channel. The nine feet spot in the centre of the shoal bears from the centre of Fort Columbus **E.** $\frac{1}{2}$ **S.**, distant eight hundred and fifty yards, and from the centre of Castle Garden **SE.** by **S.** $\frac{3}{4}$ **S.**, distant nearly seventeen hundred yards. Both ends of the shoal are marked by spar-buoys painted red and black in horizontal stripes. There is an excellent channel one hundred and fifty yards wide with not less than six fathoms between the shoal and Governor's Island. This channel is very frequently used and is perfectly safe if you give Governor's Island a berth to the westward of not less than one hundred yards.

The Middle Ground.

Dimond Reef and Coenties' Reef, which formerly existed on the New York side, have been removed; but you must be careful not to approach the wharf-line (just to the eastward of South Ferry) nearer than one hundred and fifty yards on account of a *twelve feet shoal* which makes off to the southward for about one hundred yards.

SAILING DIRECTIONS

FOR PASSING FROM LONG ISLAND SOUND THROUGH EAST RIVER INTO NEW YORK BAY.

When abreast of the red buoy off Throg's Neck Shoal, round it at a distance of three hundred yards and steer **W.** by **N.** $\frac{1}{2}$ **N.** for about one mile, heading exactly for Old Ferry Point and carrying not less than six fathoms. On this course, when within half a mile of Old Ferry Point, in fifteen fathoms, with Whitestone Point a little abaft the beam, bearing about **S.** $\frac{1}{4}$ **W.** and distant four hundred and fifty yards, steer **W.** $\frac{1}{4}$ **S.**, carrying not less than six and a half fathoms, until you have passed College Point and have come within about twelve hundred yards of Riker's Island,—the middle of College Point bearing **SE.** by **E.** $\frac{3}{8}$ **E.** and Spofford's or Hunt's Point **N NW.** **Northerly**, a little over six hundred yards off. Here you will have nine fathoms, with the northern end of Riker's Island bearing **W.** by **N.** $\frac{1}{4}$ **N.** in range with the light-house on The North Brother. Now steer **NW.** by **W.** $\frac{3}{8}$ **W.**, carrying not less than seven fathoms; and, *if intending to pass between the North and South Brothers*, when North Brother Light-house bears **W.** $\frac{1}{2}$ **N.**, distant three-quarters of a mile, and the middle of Barretto's Point **N.** $\frac{3}{8}$ **W.**, distant about three hundred yards, steer **W.** **Southerly**, which will lead with not less than four fathoms between the light on The North Brother and the black buoy off The South Brother. *But, if intending to pass to the northward of The North Brother*, continue the course **NW.** by **W.** $\frac{3}{8}$ **W.** towards the northeastern end of Port Morris until North Brother Light-house bears **S.** $\frac{1}{2}$ **W.** and you are distant from the northern end of the island about two hundred yards, with fifteen fathoms water. Now steer **SW.** $\frac{3}{8}$ **W.**, with the northeastern point of Ward's Island a little to the northward of the course, and this continue until you come abreast of Sunken Meadow and have the striped buoy on The Middle Ground in range with Lawrence's Point on a bearing of **SE.** by **E.**, about one hundred and fifty yards off. The course is now **SW.** $\frac{1}{2}$ **S.** for about eleven hundred yards until past Polhemus' Dock, with Hallet's Point and Negro Point Bluff in range on a bearing of **W SW.** **Westerly** and a depth of fifteen fathoms. Thence steer **SW.** $\frac{3}{4}$ **W.** to the entrance to Hell Gate if bound through the Eastern Channel, or **SW.** by **W.** $\frac{1}{4}$ **W.** if bound through the Main Channel.

It is scarcely necessary to remark that no vessels, except powerful steamers, can pass through Hell Gate without a favorable tide;—that is, if coming from the eastward they must have an ebb tide, and if from the westward a flood tide. If the tide makes unfavorably, anchorage may be found in Pot Cove, on the northeastern side of the Astoria peninsula, or in Hallet's Cove, on its southwestern side. Care must be taken in this latter cove not to make a flying moor, as the bottom is rocky and many anchors are lost here.

Vessels which have come through between the North and South Brothers continue the **W.** **Southerly** course until North Brother Light-house bears **NE.** $\frac{3}{4}$ **E.**, distant an eighth of a mile, when they steer **SW.** $\frac{3}{4}$ **W.**, passing one hundred and fifty yards to the northwestward of Flushing Bay Buoy, fifty yards to the westward of Lawrence's Point buoy, and one hundred and fifty yards to the eastward of the striped buoy on The Middle Ground. *If bound through the Main Channel* they continue this course until Negro Point Bluff and Hallet's Point come in range on a bearing of **W SW.**

Sailing Direc- **Westerly**, when they steer **SW.** by **W.** $\frac{1}{4}$ **W.** until the middle of Great Mill Rock **tions---East** bears **NW.** by **W.** $\frac{1}{2}$ **W.** and Hallet's Point **W.**, when **NW.** by **W.** will lead safely **River.** between Great Mill Rock and Heel-tap Rock with not less than four and a half fathoms,—taking advantage of the full strength of the ebb current. *But, if intending to pass through the Eastern Channel, the SW. $\frac{3}{4}$ W. course must be continued until Hallet's Point bears W., Negro Point N. $\frac{1}{2}$ E., and the middle of Great Mill Rock WNW., when a W. by N. $\frac{1}{4}$ N. course will lead safely through the Eastern Channel with not less than five and a half fathoms at low water. You may pass within eighty yards of Hallet's Point with safety now that the reef has been removed.*

Having passed between Great Mill Rock and Heel-tap Rock continue the **NW.** by **W.** course until Blackwell's Island Light-house bears **S.** $\frac{3}{4}$ **W.** and the eastern extremity of Horn's Hook **SSW.**, when steer **S.** by **W.** $\frac{3}{8}$ **W.** *if intending to pass on the western side of Blackwell's Island; or steer for the light-house if intending to pass to the eastward of the island, giving the light a berth to the westward of about fifty yards.* This latter channel is the best, though narrower and not so deep as that between the island and the New York shore; and this is the case especially when coming from the westward, where the flood tide sets directly on to Middle Reef.

If you have come through the Eastern Channel of Hell Gate you must continue the **W.** by **N.** $\frac{1}{4}$ **N.** course until the middle of Hallet's Point bears **S.** $\frac{3}{4}$ **W.**, one hundred and fifty yards off, and Blackwell's Island Light-house **SW.** $\frac{1}{2}$ **S.**, half a mile distant, and steer **SW.** $\frac{1}{4}$ **W.** for about a quarter of a mile until Horn's Hook bears **W.** by **N.** $\frac{5}{8}$ **N.**, distant nearly three hundred yards, when **S.** $\frac{1}{2}$ **W.** will lead safely midway between Blackwell's Island Light-house and the Astoria shore; or the **SW.** $\frac{1}{4}$ **W.** course continued will lead into the channel between Blackwell's Island and the New York shore. *If you pursue the former course,—that is, pass between Blackwell's Island Light-house and the Astoria shore,—when off Hallet's Cove, with Blackwell's Island Light-house bearing NW. by N., distant about two hundred yards, steer SW. $\frac{1}{4}$ S., keeping nearest to the Blackwell's Island shore, which is bold-to and may be approached within twenty yards with not less than four fathoms.* Continue this course past Blackwell's Island and until you come abreast of Hunter's Point, at the mouth of Newtown Creek,—the black buoy (No. 3) on the middle shoal of Blackwell's Island Reef being exactly abeam, bearing **NW.** $\frac{1}{4}$ **W.**, and an eighth of a mile off. Here you will have about six fathoms at low water and must steer **S.** $\frac{3}{4}$ **W.** towards the Brooklyn (formerly Williamsburgh) wharves, carrying not less than five and a half fathoms, until you come abreast of the red spar-buoy on Shell Reef, which should bear **W.** $\frac{1}{4}$ **S.**, distant about three hundred and fifty yards. Now steer **SW.** $\frac{1}{4}$ **S.** for the western end of the Navy Yard, carrying not less than six fathoms. The sailing-lines for both the eastern and western Blackwell's Island channels unite abreast of Shell Reef buoy.

If you desire to pass to the westward of Blackwell's Island, between it and the New York shore, (which is the widest and deepest channel and is entirely unobstructed,) continue on the **SW.** $\frac{1}{4}$ **W.** course, as above mentioned, from abreast of Horn's Hook until past Blackwell's Island Light-house and the northern end of the island and nearly abreast of the northernmost of the large public buildings. Then keep the middle of the passage on a **SW.** $\frac{1}{2}$ **S.** course, carrying not less than six fathoms, until you come nearly abreast of the black buoy on the "ten feet spot" on the southern end of Blackwell's Island Reef, which should bear **SE.** by **S.**, distant an eighth of a mile. The southern end of Hunter's Point (easily recognized as the northern point of entrance to Newtown Creek and the terminus of the Hunter's Point Railroad) will bear **E SE.** and you will be exactly abreast of the foot of Thirty-fourth street, in nine fathoms water. Now steer **S.** $\frac{1}{2}$ **E.** towards the Brooklyn wharves, carrying not less than five and a half fathoms, until you come abreast of the red buoy on Shell Reef, where this channel unites with the eastern channel, and you must steer **SW.** $\frac{1}{4}$ **S.** towards the western end of the Navy Yard, as above mentioned.

When off the Navy Yard, with the western end of Cob Dock bearing S. $\frac{3}{4}$ E., distant a quarter of a mile, and the southernmost wharves in New York (near the Battery) come in range with the northernmost point in Brooklyn on a bearing of W. $\frac{1}{4}$ S. Southerly, steer W. $\frac{1}{4}$ S., keeping about in mid-river and carrying not less than eight and a half fathoms until you open Buttermilk Channel, and the northwestern point of Governor's Island bears SW. by W. $\frac{1}{4}$ W. Now steer SW. by W. towards the middle of Fort Columbus, (on Governor's Island,) carrying not less than five fathoms, until the southeastern end of Ellis' Island (see description of New York Harbor) bears W. by N. $\frac{1}{2}$ N.

and you are about midway between the New York and Brooklyn shores. On this *Sailing Directions* course you will pass under the "Brooklyn Bridge," which connects New York and Brooklyn; and when this bridge shall have been completed large vessels must strike their upper spars in order to pass safely through. The pilot will, however, give due warning on this subject. At present (September, 1880) the bridge has not been completed.

Continue the course W. by N. $\frac{1}{2}$ N. towards the southeastern end of Ellis' Island for about six hundred and fifty yards, carrying not less than eight fathoms, until the northwestern end of Governor's Island (the fog-bell frame if it can be seen) bears *SW. by S. $\frac{1}{4}$ S.*, distant three hundred and fifty yards, and the centre of Castle Garden *N. by E. $\frac{1}{4}$ E.*, distant nine hundred yards, when steer *N NW.* towards the Jersey shore and anchor on the flats; or steer *N. $\frac{3}{4}$ W.* if bound up North River; or, if bound down the bay, steer *W. by S. $\frac{1}{4}$ S.* for three-eighths of a mile, with Bedloe's Island (see description of New York Harbor) just open to the northward of the course, until the northwestern end of Governor's Island bears *E. by S. $\frac{1}{4}$ S.*, distant a quarter of a mile, and Robbins' Reef Light-house *SW. $\frac{1}{4}$ W.*, distant a little over two miles and three-quarters, when steer *SW. $\frac{3}{8}$ S.*, carrying not less than eleven fathoms, until the northern point of Red Hook bears *E. $\frac{3}{8}$ N.*, the middle of Oyster Island *NW. by N.*, and Robbins' Reef Light-house *SW. $\frac{3}{4}$ W.*,—the last mentioned being one mile and a half distant. Here is ten fathoms, and *SW. by S. $\frac{1}{2}$ S.* will lead down the bay. (See Sailing Directions for New York Harbor.)

Or, wishing to pass closer to the New York side.—When, on the *W. $\frac{1}{4}$ S.* course from off the Navy Yard, you open Buttermilk Channel and the northwestern end of Governor's Island bears *SW. by W. $\frac{3}{4}$ W.*, as before, steer that course, carrying not less than four and a quarter fathoms, until the southern extremity of The Battery (Whitehall Point) bears *NW. by W. Nearly*, distant a little over a quarter of a mile, when steer *W. by S. $\frac{1}{4}$ S.*, (with Bedloe's Island just open to the northward of the course,) carrying not less than four and three-quarter fathoms, until the southeastern end of Ellis' Island bears *W. by N. $\frac{1}{2}$ N.* and the centre of Castle Garden *N. by E. $\frac{1}{4}$ E.*, distant nine hundred yards, when you will have nine fathoms. Now steer *N NW.* to anchor off the Jersey Flats; *N. $\frac{3}{4}$ W.* if bound up the North River; or, if bound down the bay, continue the *W. by S. $\frac{1}{4}$ S.* course past Governor's Island until the northwestern point of the island bears *E. by S. $\frac{1}{4}$ S.*, distant a quarter of a mile, and Robbins' Reef Light-house *SW. $\frac{1}{4}$ W.*, distant a little over two miles and three-quarters, as before, when steer *SW. $\frac{3}{8}$ S.* and follow the directions given above.

But, wishing to pass through Buttermilk Channel, (between the Brooklyn shore and Governor's Island.)—When on the *W. $\frac{1}{4}$ S.* course you open the channel, with the northwestern point of Governor's Island bearing *SW. by W. $\frac{3}{4}$ W.* and the centre of Fort Columbus *SW. by W.*, steer *SW. by S. Nearly*, following the line of the Brooklyn wharves in order to avoid The Middle Ground. On this course, when the southern end of Governor's Island bears *W. $\frac{1}{4}$ S.*, distant between eight and nine hundred yards, and the centre of Fort Columbus *NW. by W. $\frac{3}{8}$ W.*, distant nearly half a mile, you will have six fathoms, with a black spar-buoy about nine hundred yards off bearing *W. by S. $\frac{1}{4}$ S.* and a red spar-buoy five-eighths of a mile off bearing *WSW.* The black spar-buoy, which is marked No. 3, is about one hundred and fifty yards to the southward of Governor's Island, in eighteen feet water, and marks the southern end of *Governor's Island South Shoal*, which has from two to nine feet water upon it. The red buoy (marked No. 2) marks the northwestern end of *Red Hook Flats* and the southern side of Buttermilk Channel. Red Hook Flats extend along the northern face of Red Hook to a distance of three hundred yards from shore, and, together with Governor's Island West Shoal, diminish the width of the channel to a little over two hundred yards. The buoy at their northwestern end is placed in three fathoms to mark the southern point of entrance to Buttermilk Channel from the westward; and the western end of *Governor's Island West Shoal* is marked by a black spar-buoy (No. 1), placed in eighteen feet on a bearing of *W. by N. $\frac{3}{4}$ N.* from the red buoy on the northwestern end of Red Hook Flats and *SW. by S. $\frac{1}{4}$ S.* from the fog-bell frame on the northwestern end of Governor's Island, which is distant eleven hundred yards. Governor's Island West Shoal extends in a *SW. by W.* direction from the island for about eight hundred and fifty yards, and has eleven feet on it four hundred yards *W. by S.* from the southern point of the island and sixteen feet seven hundred yards from the same point. The centre of Castle Garden bearing *NE. by N. $\frac{1}{4}$ N.* clears this shoal to the westward of it.

Sailing Direc- *From the above position, in six fathoms, with the centre of Fort Columbus*
tions--East bearing **NW. by W. $\frac{3}{4}$ W.** and the southern end of Governor's Island **W. $\frac{1}{4}$ S.**, steer **W.**
River. by **S. $\frac{1}{4}$ S.**, passing midway between the black buoy on Governor's Island South Shoal
 and the northeastern end of Red Hook Flats and carrying not less than five and a
 quarter fathoms. Continue this course into the Upper Bay until the northern point of Red Hook
 bears **E. $\frac{3}{4}$ N.**, the middle of Oyster Island **NW. by N.**, and Robbins' Reef Light-house **SW. $\frac{3}{4}$ W.**,—
 the last mentioned being one mile and a half distant. Here you will have ten fathoms and **SW. by**
S. $\frac{1}{2}$ S. will lead towards The Narrows, following the directions for New York Bay. ;

In passing through the East River from Long Island Sound the courses given in the above
 directions pass three hundred yards to the southward of the buoy on Throg's Neck Shoal; four hun-
 dred yards to the northward of Whitestone Point; a little over two hundred yards to the southward
 of Old Ferry Point; about two hundred yards to the northward of the black buoy on College Point
 Reef; six hundred yards to the southward of Clason's Point; a quarter of a mile to the northward
 of the eastern end of Riker's Island East Flats; four hundred and fifty yards to the southward of
 Spofford's Point; and nearly three hundred yards to the southward of Barretto's Point. *If you go to*
the northward of The North Brother the courses pass an eighth of a mile to the northward of Riker's
 Island; one hundred and fifty yards to the northward of The North Brother; two hundred and fifty
 yards to the eastward of Stony Point; four hundred and fifty yards to the northwestward of the
 black spar-buoy on the northeastern end of Lawrence's Point Ledge, (Flushing Bay Buoy;) three
 hundred and fifty yards to the northwestward of the black buoy on the northern end of Lawrence's
 Point Ledge; and a little over one hundred yards to the westward of the striped buoy on The Middle
 Ground. *If you go between the North and South Brothers* the courses pass about seventy-five yards to
 the northward of Riker's Island; fifty yards to the northward of the black buoy on the northern end
 of South Brother North Reef; one hundred and fifty yards to the southward of North Brother Light-
 house; the same distance to the northwestward of Flushing Bay Buoy; fifty yards to the northwestward
 of the black buoy on the northern end of Lawrence's Point Ledge; and one hundred and fifty yards to
 the eastward of the striped buoy on The Middle Ground. *On entering Hell Gate, if you use the Main*
Channel the courses pass two hundred and fifty yards to the northward of Hallet's Point; about fifty
 yards to the northward of Shelldrake Rock; two hundred and fifty yards to the southwestward of
 Holmes' Rock; nearly three hundred yards to the southwestward of The Hog's Back; about eighty
 yards to the southwestward of The Frying Pan; an eighth of a mile to the northeastward of the north-
 eastern end of Middle Reef; nearly one hundred yards to the northward of Great Mill Rock; sixty
 yards to the southwestward of Heel-tap Rock; about thirty yards to the southwestward of the "eleven
 feet rock;" nearly twenty-five yards southwest of Heel-tap Rock; one hundred and fifty yards to the
 westward of Great Mill Rock; one hundred yards to the westward of Little Mill Rock; a little over
 one hundred yards to the westward of the Little Negro Head, (on the northwestern end of Middle
 Reef;) two hundred yards to the westward of The Hen and Chicken; about sixty yards to the east-
 ward of Horn's Hook; two hundred yards to the westward of Blackwell's Island Light-house; an
 eighth of a mile to the westward of the middle part of Blackwell's Island Reef; two hundred yards
 to the westward of the black spar-buoy next met with on the reef; an eighth of a mile to the north-
 westward and a hundred yards to the westward of the black spar-buoy on the southwestern end of the
 reef; one hundred and fifty yards to the eastward of the striped buoy on Nes' or Easby's Rock; and
 about three hundred and fifty yards to the eastward of the red buoy on Shell Reef. *If you go through*
the Middle Channel of Hell Gate you pass one hundred and fifty yards to the southward of Great Mill
 Rock and about forty yards to the southward of the shoal off that rock; about thirty yards to the
 northward of the eastern end of Middle Reef; one hundred and fifty yards to the northward of The
 Gridiron; one hundred and seventy-five yards to the northward of Flood Rock; and sixty yards to
 the northward and about one hundred yards to the westward of the Little Negro Head. *If you go*
through the Eastern Channel you pass one hundred and fifty yards to the northward and seventy-five
 yards to the westward of Hallet's Point; a little over one hundred yards to the eastward of the north-
 eastern end of Middle Reef; about eighty yards to the eastward of The Gridiron; ninety yards to the
 eastward of Flood Rock; one hundred and fifty yards to the eastward of Blackwell's Island Light-
 house; an eighth of a mile to the eastward of the middle part of Blackwell's Island Reef; the same
 distance to the eastward of the black spar-buoy next met with on the reef; four hundred yards to the

eastward of the black spar-buoy on the southwestern end of the reef; three hundred yards to the eastward of the striped buoy on Easby's Rock; and the same distance to the eastward of the red buoy on Shell Reef. The sailing-lines unite abreast of this buoy, and *if you pass out by the Buttermilk Channel* the courses lead about one hundred yards to the eastward and one hundred and fifty yards to the southward of The Middle Ground; one hundred and fifty yards to the northward of the northeastern end of Red Hook Flats; one hundred yards to the southward of the black buoy on Governor's Island South Shoal; seventy-five yards to the northward of the red buoy on the northwestern end of Red Hook Flats; and an eighth of a mile to the southward of the black buoy on the end of Governor's Island West Shoal.

GENERAL REMARKS

ON THE COURSES AND CURRENTS IN HELL GATE.

As before mentioned, unless you have a strong fair wind it is not advisable to attempt the passage of Hell Gate against the tide. You should enter from the eastward with the ebb tide; and large vessels generally take the Main Channel, as there is less current there. The Eastern Channel is, however, quite safe since the destruction of Hallet's Point Reef, and has equally good water. If a buoy were placed upon the northeastern end of Middle Reef and another on the southeastern end of the reef extending in that direction from Great Mill Rock, the Middle Channel would also be comparatively safe for vessels drawing not more than sixteen feet; but at present it is best to use only the Eastern and Main channels. Vessels must not give The Frying Pan too wide a berth for fear of being set on to Middle Reef, or the shoals southeast of Great Mill Rock, or into the Middle Channel. It is safe to stand within seventy-five yards of Negro Point. With a fair wind you may stand close to The Frying Pan ripple and give Great Mill Rock a berth of about one hundred yards to avoid the eddies which extend out from it in a northeasterly direction. You may open Little Mill Rock until Horn's Hook and Gallows Hill (on Blackwell's Island) are nearly in range, and steer about for Blackwell's Island Light-house, having it a little open to the westward of the course. This will bring you into the Middle Channel tide. If the wind be light it is best to take the channel on the eastern side of Blackwell's Island; but if the tide be strong take the western channel.

Entering the Gate from the Eastward with the wind SW. or dead ahead, go about near Negro Point Bluff and stand towards Scaly Rock (on the Long Island shore) so as to tack again a ship's length outside the eddy. The next tack will bring you, under ordinary circumstances, a little to the windward of Negro Point. Now make a short tack to get as nearly as possible in the middle of the passage between Negro Point and Astoria, (or if anything inclining towards the latter,) and then stand directly through the Main Channel,—being careful *not* to bring Horn's Hook in range with the large white house on Gibb's Point, (at the northern end of Ravenswood.) This will avoid Rylander's Reef. The next tack will fetch between Great Mill and Little Mill rocks, on the edge of the eddies, where you must tack, (with Blackwell's Island Light-house and Gibbs' Point in range,) making a short board toward Rylander's Reef, and tack again off that reef, where, meeting the Middle Channel tide, you will be forced up into the wind,—the current drifting you to windward clear of all danger.

With a good breeze vessels may pass through the Middle Channel, carrying nineteen feet at low water, and thus save two tacks and avoid the danger of Rylander's Reef and the eddies. To do this, after passing The Frying Pan, stand towards the northern end of Little Mill Rock until within one hundred yards of it, when steer towards the southern end, passing within thirty yards of it, and tacking before Horn's Hook and the white house on Gibbs' Point come in range. Passing through either this or the Main Channel, take the channel to the westward of Blackwell's Island,—the winds being more steady in that direction. Go pretty close to Horn's Hook,—always avoiding the eddies,—and after passing it keep as near the middle of the channel as possible and never shut in one point of land with another.

Take the same course with a southerly wind; but with a *northerly* wind cross over to the eastern side of Blackwell's Island,—giving the light-house a berth of not less than eighty yards. The greatest danger from the eddies off the light-house is on the ebb.

The Eastern Channel is much safer than formerly, and is now very frequently used on the ebb tide,—the line of true current being much wider since the destruction of the reefs. You may *shave*

Hallet's Point very close and steer with Flood Rock open a little to the northward of the course. The vessel will be apparently drifting upon the rock, but when her bow gets within the influence of the true current it will put her head directly through the channel. The cause of vessels getting ashore on The Gridiron is want of decision on the part of the pilot as to which channel to take.

In light winds steer for Hallet's Point when abreast of Shelldrake Rock.

Entering from the Eastward against the flood tide, but with a fair wind, you may go either around Great Mill Rock (giving it a good berth to the southeastward) or else pass through the Middle Channel.

Entering Hell Gate from the Westward with the flood tide: The channel east of Blackwell's Island is the best,—vessels standing through the west channel running great danger of being carried by the current on to Middle Reef. With a head wind you may beat through the Gate either by the Eastern Channel, or, with a commanding breeze, by the Main Channel to the northward of Great Mill Rock. In the latter case you may stretch to the eastward within one hundred yards of The Hog's Back with safety. Large vessels should, as a rule, pass through the Main Channel. To do this you must reverse the courses given in the Sailing Directions, steering with Great Mill Rock well open to the eastward of the course and standing past it to the northward far enough to avoid the eddies, which extend about thirty yards from the rock. In steering to the southeastward, between Ward's Island and Astoria, see that the ripple of The Frying Pan is kept about a point to the northward of the course. You may, after passing The Frying Pan, head up towards Negro Point, which you may approach from the southward within sixty yards. After passing this point, if you keep the middle of the channel, the current will take you to the westward of The Middle Ground off Lawrence's Point.

The eddies off Hatter's Dock (the northern point of entrance to Hallet's Cove) and those off Blackwell's Island Light-house (both of which show very plainly) must be carefully avoided,—the former by keeping nearest to the Blackwell's Island shore until past the dock, and the latter by keeping over towards the Astoria Ferry, which you may pass within fifty yards. If you now steer for the middle of Flood Rock you will come into the true flood tide abreast of that rock; and by steering with The Hog's Back about half a point open to the southward of the course you will go clear of danger until you are nearly up with The Frying Pan ripple. Now you must steer to the southeastward to get into the true current of flood, round Negro Point, and proceed as before directed.

Having come through the Blackwell's Island western channel, do not attempt to pass over to the Eastern Channel of Hell Gate unless the wind is fair and fresh. Then stand across past Flood Rock and steer to the southeastward towards Negro Point, following the directions given above.

With a light wind from the westward you are at the mercy of the current and must hug The Frying Pan, (passing only about a ship's length to the southward of it,) and in order to avoid Cram's Bank tack in towards Negro Point when it bears N., standing on only long enough to get headway on the vessel, then tack again and keep in mid-channel.

With no prospect of wind anchor in Hallet's Cove, to the northward of Thorburn's Dock,—being careful to avoid the Middle Ground by passing the dock at a distance of sixty yards; and when abreast of it steering with the steamboat wharf near the head of the bight a little open to the westward of the course. Large vessels should pass to the westward of Hallet's Middle Ground and steer about E. $\frac{1}{2}$ S. towards the middle of **Blackwell's Dock**. Do not let go the anchor until the vessel has stern-way on to avoid the danger of losing it, as the bottom is very rocky.

Getting under way from this cove, stand out due W. from Thorburn's Dock. Vessels frequently stand too near Hatter's Dock, when they invariably strike on *Baldheaded Billy*, a round smooth rock, dry at low water.

If, owing to light westerly or northeast winds, you are in danger of getting ashore near Woolsey's Bath House, run into Pot Cove and anchor. The current turns into this cove opposite the Bath House and will enable you to reach good anchorage.

If the tide be slack and the wind fair you may take the Eastern Channel through the Gate; but with a head wind you must allow room for tacking when near Flood Rock, as a slight under-current which exists here is apt to make vessels miss stays and go upon The Gridiron. This danger will cease

to exist as soon as the shoals surrounding the two rocks are filled in and formed into an island—a work which is now in progress. The longest tacks can be made by going through the Main Channel and passing to the northward of Great Mill Rock. But here you run the chance of losing the slack water, which never lasts more than ten minutes and generally not more than six.

Bound through the Gate from the Westward on the ebb tide, with a fair wind keep along shore near Hallet's Point to avoid the strength of the current; but after passing this point keep in the middle of the passage to avoid Shelldrake Rock. Unless, however, the breeze is very strong you should not attempt to pass through the Gate from the westward after the ebb tide has been running twenty minutes. Abreast of Hallet's Point vessels meet the strong current of ebb, which sets them over towards The Gridiron, when they must either go ashore or anchor at great risk.

LIGHT-HOUSES.

NAME.	Latitude.	Longitude West.		Fixed or Revolving.	Height above sea-level.	Distance visible in nautical miles.
		In arc.	In time.			
	° ' "	° ' "	h. m. s.		Fect.	
Throg's Neck Light-house	40 48 17	73 47 30	4 55 10	Fixed.	66	11
North Brother Light-house				Fixed.	50	11
Blackwell's Island Light-house				Fixed red.	54	13

TIDES.

	Throg's Neck.	Pot Cove.	Hell Gate Ferry.	Governor's Island.
Corrected Establishment	11 ^h 20 ^m	11 ^h 29 ^m	10 ^h 6 ^m	8 ^h 13 ^m
Mean Rise and Fall of tides	7.3 ft.	5.8 ft.	4.4 ft.	4.4 ft.
Mean Rise and Fall of Spring tides	9.2 ft.	6.2 ft.	5.0 ft.	5.2 ft.
Mean Rise and Fall of Neap tides	6.2 ft.	5.0 ft.	3.6 ft.	3.4 ft.
Mean duration of Rise	5 ^h 50 ^m	5 ^h 39 ^m	6 ^h 13 ^m	6 ^h 0 ^m
Mean duration of Fall	6 ^h 33 ^m	6 ^h 52 ^m	5 ^h 59 ^m	6 ^h 25 ^m
Mean duration of Stand	0 ^h 43 ^m	0 ^h 16 ^m	0 ^h 15 ^m	0 ^h 28 ^m
Rise of highest tide observed	11.7 ft.	8.2 ft.	7.4 ft.	6.6 ft.

CURRENTS IN EAST RIVER.

The following table, prepared under the direction of the Superintendent of the Coast Survey, gives in a concise form such information as to the set and velocity of the current and the time of its greatest strength as is at present available. In the columns headed "Time" is noted the time at which the current attains its greatest velocity, given in hours and minutes after the Moon's transit. So also with the columns headed "Slack Water" and "Tides."

TABLE SHOWING THE TIMES OF THE CURRENT AND OF THE TIDE, GIVEN IN HOURS AND MINUTES AFTER THE MOON'S TRANSIT, (SOUTHING.)

No.	STATIONS—LOCALITY.	Strength of Flood Current.			Strength of Ebb Current.			Slack Water.		Tides.			
		Set.	Drift.	Time.	Set.	Drift.	Time.	Between Flood and Ebb.	Between Ebb and Flood.	High Water.	Low Water.	Rise and Fall.	
			Knots.	h. m.		Knots.	h. m.	h. m.	h. m.	h. m.	h. m.	Feet.	
1	Off Throg's Neck	Neaps Springs	0.8	6 33		0.7	12 43	9 40	15 30	}	11 20	}	6.1 9.2
2	Off Old Ferry Point		1.5	4 15		0.8	10 25	7 22	13 12				
3	Between Polhemus' Dock and Negro Point Bluff.	E. by S. $\frac{1}{2}$ S.	1.6		NW. $\frac{1}{4}$ W.	1.1		9 33	15 7				
4	Between Hallet's Point and The Hog's Back.	NE. $\frac{1}{2}$ N.	3.1	7 6	SW.	2.3	13 12	10 9	16 3				
5	Northern end of Blackwell's Island western channel.	E. $\frac{1}{2}$ S.	8.5		W. by N. $\frac{1}{2}$ N.	4.4		9 26	15 50		11 7	5.8	
6	Northern end of Blackwell's Island eastern channel.	NE. $\frac{1}{2}$ N.	4.2	6 3	SW. West'y	4.2	12 38	9 35	15 27	10 6	16 20	4.45	
7	Southern end of Blackwell's Island western channel.	NE. $\frac{1}{2}$ N.	4.2	6 3	SW. $\frac{1}{2}$ S.	4.2	12 38	9 35	15 27	10 6	16 20	4.45	
8	Southern end of Blackwell's Island eastern channel.		2.7			3.2		9 35	16 7				
9	Just to the eastward of Wall Street Ferry.		3.1			2.7		9 29	15 3				
				6 39			12 28	9 25	15 36				

Remarks.—Between Pot Cove and Negro Point the current of ebb runs close to Pot Rock; but this is of little importance, as the rock has been blasted away to a depth of twenty-one feet at low water.

Between Hallet's Point and Middle Reef the most rapid current on the ebb is very close to Flood Rock,—too near for a vessel to lie with safety. The force of the whirls which formerly existed here has been very much diminished by the destruction of Hallet's Point Reef, and it is now comparatively safe for vessels to pass through the Eastern Channel from either the eastward or the westward.

Between Great Mill Rock and Ward's Island the current of flood has numerous though not violent eddies. The direction of the current of ebb is from Pot Rock towards The Gridiron. The slack water is of a few minutes' duration and the flood current is very weak,—the main stream passing to the southward of Flood Rock.

In the Main Channel, off Rylander's Reef, the slack water lasts twenty minutes. The current of flood is weak but that of ebb is direct and strong.

In the Middle Channel the current of ebb is broad and rapid, with numerous eddies.

Between Ward's Island and Ringgold's Dock the slack water lasts twenty-five minutes. The main body of the current passes on the southeastern side of the island.

At Station No. 3 (see table) the change from flood to ebb takes place suddenly.

At Stations Nos. 5 and 6 the currents of both flood and ebb are strong and direct and nearly in the direction of the channel.

In the table the directions are *magnetic* and the drift in *nautical* miles per hour.

VARIATION OF THE COMPASS.

The magnetic variation at Throg's Neck for 1880 is $8^{\circ} 5' W.$; and at Governor's Island it is $7^{\circ} 38' W.$,—the approximate annual increase being $2\frac{1}{2}'$.

GARDINER'S BAY.

Gardiner's Bay is a large bay of irregular shape lying at the western end of Block Island Sound, from which it is separated by Gardiner's Island. Its northern shore is formed by the northeastern end of Long Island, (commonly known as Oyster Pond Peninsula,) its eastern shore by Gardiner's and Ram islands and the reefs connecting them, its southern shore by a portion of the northern shore of Long Island, and its western shore by Shelter Island, which separates the bay from Shelter Island Sound and the Peconic Bays. The bay has an average diameter of about six miles and is singularly free from dangers,—the depth throughout its length and breadth being from three and a half to eight fathoms and affording ample beating room for large vessels. Shelter Island Sound, which lies on the northern and western sides of Shelter Island, has also deep water in it; but the channel is narrow and obstructed by shoals. Little Peconic Bay, which is next to the westward of Shelter Island Sound, has from three to seven fathoms in it, with good beating room; but its entrance is only three-quarters of a mile wide. It is five miles long **NE.** and **SW.** and very irregular in shape,—its width being in some places as great as three miles and a half, in others but two miles, and at its western end, where it joins Great Peconic Bay, it is only three-quarters of a mile wide. At this western end there is a bar one mile and an eighth wide, across which not more than fourteen feet at low water can be taken into Great Peconic Bay. This latter is nearly circular in shape, about five miles in diameter, and has a depth of from three to four fathoms covering an area about three miles and a half in diameter,—the rest of the bay being occupied by flats. At its western end, between Jamesport and Southport, it is but three-quarters of a mile wide, with a depth of about nine feet through a very narrow channel leading to the mouth of Peconic River, a narrow and shallow stream running to the westward for one mile and three-quarters to the village of Riverhead.

There are three entrances to Gardiner's Bay,—two from Block Island Sound and one from Long Island Sound; but only one of those leading from Block Island Sound is available, and it is also the principal and only safe entrance for strangers. This principal entrance is between Pine Point (the southwestern extremity of Plum Island) on the north and Gardiner's Point (the northern end of Gardiner's Island) on the south. It is two miles and a half wide with a depth of from three to twenty fathoms, and entirely unobstructed. The entrance from Long Island Sound is called Plum Gut and is contained between Plum Island on the east and Oyster Pond Point on the west. It has an average width of about one mile and a quarter; but the available channel is only about five-eighths of a mile wide,—the passage being obstructed by the long reef making off from Oyster Pond Point. There are also two detached shoals in the passage,—**The Middle Ground** with nineteen feet and **Midway Shoal** with seventeen feet,—which are dangerous to vessels of large draught. There is plenty of water in the gut for vessels of the largest size; but the velocity of the tidal current is such that it is at times difficult to stem it, (unless with a strong fair wind,) and it is not, therefore, recommended to strangers. The third passage into the bay is also the southernmost, and leads from Napeague Bay to the southward of Ram Island. There is eighteen feet in the channel; but this is so extremely narrow and crooked and the passage itself is so full of shoals, few of which are marked in any way, that it is impossible to pass through it without a pilot. It should never, therefore, be attempted.

On approaching the main entrance to Gardiner's Bay from Block Island Sound, Pine Point will appear on the northern side as a low, flat, sandy point covered only with grass. To the eastward of the point the surface of Plum Island will appear undulating, of moderate height, covered with grass, and showing precipitous sandy faces at intervals. To the northward will be seen the square granite building surmounted by a lantern and known as Plum Island Light-house, the principal guide to Plum Gut.

On the southern side of the entrance will be seen **Gardiner's Point**, easily recognized by the light-house upon it. It is the northern extremity of a long flat beach which extends in a nearly **NNW.** direction from the main portion of Gardiner's Island for nearly two miles and is covered only with beach grass. The light-house, which stands close to the northern end of the point, is a circular brick tower twenty-six feet high, painted brown, and attached to the keeper's dwelling, which is of the same color. It is known as **Gardiner's Island Light-house**, and is very difficult to recognize as a light-house until close to it. It has, therefore, been recommended that the tower be either raised or painted a different color from the dwelling. It shows a fixed white light, of the sixth order, from a height of thirty-three feet above the sea, visible eleven miles. Its geographical position is

Latitude ----- 41° 8' 29" N.
 Longitude ----- 72° 8' 44" W.,

and it bears from

	Miles.
Montauk Point Light-house, NW. by W. $\frac{1}{4}$ W. -----	13 $\frac{1}{2}$
Block Island North Light-house, W. $\frac{1}{4}$ S. -----	26 $\frac{1}{2}$
Block Island Southeast Light-house, W. $\frac{1}{4}$ N. -----	27
Point Judith Light-house, W. by S. $\frac{1}{4}$ S. -----	33
Watch Hill Light-house, SW. by W. $\frac{1}{4}$ W. -----	16 $\frac{1}{2}$
Race Rock Light-house, SW. -----	7 $\frac{1}{2}$
Little Gull Island Light-house, SW. by S. $\frac{1}{4}$ S. -----	4 $\frac{1}{2}$
Plum Island Light-house, SE. $\frac{1}{4}$ E. -----	nearly 3 $\frac{1}{2}$

From this light-house the entrance buoy to Sag Harbor bears **SW. $\frac{1}{4}$ W.**, six miles and a half; the entrance buoy to Greenport Harbor **W. by S. $\frac{1}{4}$ S.**, five miles and three-quarters; and Long Beach Point Light-house **W. $\frac{1}{4}$ S.**, seven miles and a quarter distant.

Gardiner's Island has been before described on pages 308-309. It is very irregular in shape, about five and three-quarter miles long **NNW.** and **SSE.**, and is composed for the most part of a hilly rolling country of moderate height, nearly all grassy, but showing occasional groves of trees. The long beach above mentioned as extending from the main body of the island and terminating in Gardiner's Point begins at the base of a thickly wooded bluff head; and on its western side, between Gardiner's Point and this bluff, is formed a large cove with clean shores called **Bostwick's Bay**, in which excellent anchorage may be found in from eighteen to twenty-three feet, protected from all winds except those from the westward. The bluff forming the southern point of this bay is called **Crow Head** and sometimes **Western Head**; and on its southern side a bay, similar to Bostwick's Bay, is formed by the curve of the west shore of the island, in which anchorage may be found in from three to five fathoms, sheltered from all winds. There is, however, a long shoal making off to the southwestward from the head for one mile and five-eighths; and vessels of greater draught than fourteen feet must, if wishing to anchor in the bight to the southward, give the head a berth of two miles to the eastward until past the shoal.

The southern end of Gardiner's Island is a low sandy point, about one hundred yards wide, and destitute of all vegetation. A reef of rocks half a mile long connects it with a low, flat, sand islet, three-quarters of a mile long, called **Ram Island**. This island lies **NNE.** and **SSW.**, is destitute of all vegetation and surrounded by dangerous shoals. On its southern side passes the **Ram Island Channel**, which, as before mentioned, leads from Napeague Bay into Gardiner's Bay. It is, however, so narrow and full of shoals that none but those well acquainted with its dangers dare to attempt to pass through it.

A narrow and shallow inlet, called **Acabomock Harbor**, opens into the Long Island shore about one mile and a half **W.** by **S. $\frac{1}{4}$ E.** from Ram Island; but it is of no importance. The small settlement of **The Springs** lies at the head of this harbor and the village of **Kingstown** about three-quarters of a mile inland.

Two miles and a quarter to the northward of Acabomock Harbor is Hog Creek Point, on the southern shore of Gardiner's Bay; and between the two and about half a mile to the southeastward of the point is a small settlement known as **The Fireplace**. Hog Creek Point is grassy, about six feet high, with precipitous faces about twenty feet high on the bay side. The land behind it rises to a height of from eighty to one hundred feet and is for the most part thickly wooded. **Hog Creek**, a very narrow stream, nearly bare at low water, makes in on the western side of the point; and from its mouth the south shore of Gardiner's Bay runs nearly **SW.** for one mile and a quarter to the entrance to Three Mile Harbor. The land is hilly, undulating and thickly wooded.

Three Mile Harbor is a large shallow lagoon lying nearly **N.** and **S.**, one mile and three-eighths long, one mile wide at its northern end, and gradually diminishing in width to its head, where it is but six hundred yards wide and terminates in a small shallow stream called **Three Mile Harbor Creek**. The entrance to the harbor is, however, but little over one hundred yards wide between two flat sandy points,—that to the eastward being known as **East Point** and that to the westward as **Sammy's Beach Point**. **Sammy's Beach** is a flat sand beach, nearly one mile long, extending about **W. $\frac{1}{4}$ N.** from the entrance to Three Mile Harbor. Where it terminates to the westward and the high lands begin the general trend of the shore is to the northwestward, with a gradual curve to the westward, terminating at Cedar Point, two miles and a half from the western end of Sammy's Beach. This is a rolling country, composed of a series of hills from eighty to one hundred and sixty feet high, known as **Hedges' Banks**, and separated by narrow valleys from twenty to forty feet above sea-level. The hills near the shore-line are bare of trees but are backed by thick woods.

Cedar Point is a long, flat, sandy point making off to the westward from the mainland, and forming the eastern point of entrance to the southern channel into Shelter Island Sound, which leads to Sag Harbor. It is shoal in its approaches,—a bar, over which not more than fourteen feet can be taken, extending from this point to Ram Head, two miles and a half to the northward. A long shoal, bare in places at low water, makes off from the point to the westward for six hundred yards to a flat sandy islet known as Cedar Island, which is easily recognized by the grey stone building near the middle of the island, surmounted by a lantern. This is Cedar Island Light-house,—the principal guide to Sag Harbor,—and shows a fixed white light, of the sixth order, from a height of forty-five feet above the sea, visible eleven miles. Its geographical position is

Latitude	41° 2' 25" N.
Longitude	72° 15' 41" W.,

and it bears from Plum Island Light-house **SW. by S. $\frac{1}{2}$ S.**, a little over eight miles, and from Gardiner's Island Light-house **SW. $\frac{1}{2}$ W.**, nearly eight miles distant. Vessels bound for Sag Harbor pass to the westward of this light-house, but may go within one hundred yards of it with safety as the island is bold-to on that side.

On the northern side of Gardiner's Bay and on the western side of Plum Gut is the northeastern point of Long Island, known as Oyster Pond Point. It is low, flat and level, composed of sand, covered with grass and faced with a shingly beach. It is the eastern extremity of the **Oyster Pond Peninsula**,—a neck of low and nearly level land, under cultivation, and dotted with houses and occasional low bushy trees. The high land of **Brown's Hills** is visible from Gardiner's Bay over the flat country forming the major portion of the neck. Oyster Pond Point is very rapidly wearing away by the action of the sea, which has advanced several hundred yards within the last forty years. There is a large hotel surmounted by a cupola standing a little way back from the point and to the westward of it. A long reef, nearly bare at low water in several places and about eleven hundred yards long, makes to the eastward from this point and is known as **Oyster Pond Reef**. It is marked by a granite beacon surmounted by a spindle and cage, which serves as a guide to vessels passing through Plum Gut. This reef is not, however, in the way of vessels entering Gardiner's Bay by the Main Channel.

From Oyster Pond Point the northern shore of the bay trends about **SW. $\frac{1}{2}$ S.** for a little over two miles to Ben's Point, and thence about **W. by S. $\frac{1}{2}$ S.** for nearly two miles to Long Beach Point,—the eastern point of entrance to Orient Harbor and the western extremity of Long Beach. Between Oyster Pond Point and Ben's Point the shore is a flat sand beach, covered only with grass and backed by level cultivated fields; but at **Ben's Point**, which is also flat, there are some trees. The shore is foul between these two points and vessels of greater draught than sixteen feet should give it a berth to the westward of about one mile; but Ben's Point may be approached within a quarter of a mile with not less than three and a half fathoms.

From Ben's Point to Long Beach Point extends **Long Beach**, a narrow strip of flat sand, backed by woods. It forms, as before mentioned, the eastern point of entrance to Orient Harbor and the southern point of entrance to **Long Beach Bay**,—a shallow bay contained between this beach and the Oyster Pond Peninsula. Off Long Beach Point extends a shoal, with less than six feet water, about eight hundred yards **SW. by W. $\frac{1}{2}$ W.**; and on its extremity is built an iron screw-pile light-house, which will appear as a white dwelling surmounted by a low tower. It is called Long Beach Point Light-house, and shows a fixed red light, of the fifth order, from a height of fifty-four feet above the sea, visible thirteen miles. Its geographical position is

Latitude	41° 6' 31" N.
Longitude	72° 18' 23" W.,

and it bears from Gardiner's Island Light-house **W. $\frac{1}{2}$ S.**, seven miles and a quarter, and from the perpendicularly-striped buoy off the entrance to Greenport Harbor **NW. by W. $\frac{1}{2}$ W.**, two miles distant. This light-house should receive a berth to the northward of about five-eighths of a mile and to the eastward of eight hundred and fifty yards to pass in the best water.

A bell is struck by machinery, at intervals of fifteen seconds, during thick weather.

Shoal water makes off from Long Beach Point in a **SE.** direction for one mile and a half, and vessels drawing more than fifteen feet must be careful to give the beach a berth of one mile and three-eighths to the northward; but vessels of ten feet draught may pass within eleven hundred yards of the beach with safety, leaving the perpendicularly-striped buoy at the entrance a quarter of a mile to the southward.

Shelter Island lies all the way across the western end of Gardiner's Bay, leaving a narrow passage on its northern and another on its southern side leading to Shelter Island Sound. It is of irregular shape, lies nearly **N. and S.**, and is for the most part under cultivation. The diameter of the main body of the island in a **N. and S.** direction is nearly four miles and in an **E. and W.** direction nearly five miles; but from its southeastern end a low level peninsula extends for one mile and a quarter,—thus increasing the length of the island to a little over five miles and a half. **Hay Beach Point**, the northern extremity of the island, and the western point of entrance to Orient Harbor as well as the southern point of entrance to Greenport Harbor, is a flat sandy point backed by marsh, and this again by gently sloping wooded lands. It is comparatively bold-to and may be approached within one hundred yards with not less than three fathoms. Viewed from the eastward Shelter Island will appear of moderate height and undulating, with occasional steep hills separated by low strips of sand and the surface diversified with woods and cleared fields.



1847-1848

Gen. of Mass.

From Mass.

From Mass.

From Mass.

From Mass.

Entrance to Carclim's Bay from the Eastward, (Entrance of A. Bay bearing W. 4 S. distant 5 1/2 Miles.

Three miles **SE. $\frac{1}{2}$ E.** from Hay Beach Point is a somewhat remarkable wooded headland with steep faces known as **Ram Head**. It is the northeastern extremity of what is called Ram Island, which in itself is the southeastern end of a long peninsula of very irregular shape, beginning about one mile below Hay Beach Point on the eastern shore of Shelter Island and extending **SE.** by **E.** for two miles and three-eighths. For the most of this distance the peninsula is a mere narrow strip of sand; but about five-eighths of a mile from its western end rises a steep rocky hillock, and here a spur of land extends to the southward for half a mile and is thickly wooded on its southern end. This is **Cocles Island**; and nearly **Ram Island**. half a mile to the eastward of it begins Ram Island, which terminates the peninsula. Ram Island is about one mile long **NW.** by **W.** and **SE.** by **E.**, of an oval shape, with a greatest width of half a mile. It is somewhat undulating, wooded on its eastern but grassy and bare of trees on its western end. It forms the northern side of the entrance to **Cocles Harbor**, a shallow bay of irregular shape and a little over two miles long, which is embraced between the peninsula just described and the mainland of Shelter Island. The southern point of entrance to this harbor is a mere strip of sand backed by thick woods, and between it and Ram Island the entrance is but two hundred yards wide. This harbor is of course totally unfit for strangers, as not more than four feet at low water can be taken into it.

About one mile and an eighth **S.** by **E.** from the southern point of entrance to Cocles Harbor is Nichol's Point, the northern point of entrance to the channel leading to Sag Harbor; and here the shore turns abruptly to the westward for about half a mile, then runs **S.** by **E. $\frac{1}{2}$ E.** for one mile and three-eighths to Mashomuck Point, the southeastern point of Shelter Island and the northern point of entrance to Sag Harbor. The shore between Cocles Harbor and **Nichol's Point**. Nichol's Point is composed of sand backed by thick woods; but between Nichol's Point and Mashomuck Point are flat grassy lands with occasional groves of trees. All of the eastern shore of Shelter Island is foul,—extensive flats spreading out to the eastward, between Hay Beach Point and Nichol's Point, and forming a bar, which, as above mentioned, extends from Ram Head to Cedar Point, (on the Long Island shore,) and over which not more than fourteen feet at low water can be carried.

Orient Harbor, above mentioned, is a large indentation in the southern shore of that very long peninsula of Long Island which makes to the northeastward from Friar's Head and terminates at Oyster Pond Point, on the western side of Plum Gut. The entrance to the harbor from Gardiner's Bay is one mile and three-quarters wide between Long Beach Point and Hay Beach Point; but the passage is so much obstructed by flats that the available channel is not more than a quarter of a mile wide. The eastern shore of the harbor is occupied by the village of **Orient**, the northern shore by **Truman's Beach**, (see page 352,) and the western shore by land of moderate height and well wooded except where the thickly clustered houses of the village of **Rocky Point** appear. Anchorage in from fifteen to twenty-two feet is found in this harbor, but as **Orient Harbor**. the entrance is not well buoyed it is not safe for strangers to attempt it. In the southeastern part of the harbor and about seven-eighths of a mile to the northeastward of Long Beach Point is **Peter's Neck Point**, the southern extremity of **Peter's Neck**, and composed of sand backed by marsh. A quarter of a mile to the eastward of this is **Brown's Point**, also sandy and backed by marsh, which forms the northern point of entrance to **Long Beach Bay**, above mentioned. This bay, which is very shallow and cannot be entered by strangers, is about one mile long **E NE.** and **W SW.** and half a mile wide. At its northwestern end it receives the waters of a small and shallow stream called **Narrow River**; and at its eastern end a passage fifty yards wide leads into a lagoon one mile long, known as **Little Bay**. Of course none of these passages can be used by strangers.

The entrance to Greenport Harbor, which lies to the northward of Shelter Island, is between Cleaves' Point on the north and Hay Beach Point on the south and is about half a mile wide. **Cleaves' Point** is low, level and grassy, and is occupied by cultivated lands, behind which appear the thickly clustered houses of Rocky Point. From Cleaves' Point to Young's Point, five-eighths of a mile to the southwestward, the shore is low and for the most part wooded. **Young's Point** is the eastern point of entrance to **Stirling Basin**, a shallow cove washing the eastern side of the town of **Greenport Harbor**. Greenport, but almost entirely bare at low water. The point is flat, sandy and backed by trees. The entrance to the basin is only about twenty-five yards wide and is fit only for the passage of small boats. **Greenport** is a flourishing town, situated on the northern side of the harbor and on the western shore of the basin, and has of late years become quite popular as a summer resort. It has also some ship-building interest and a little coasting trade. Its northern suburb is known as the village of **Stirling**, and is situated about three-eighths of a mile from the southern shore of Long Island Sound.

A little over half a mile to the southwestward of Greenport is **Fanning's Point**, the southern extremity of **Pipes' Neck**. It is composed entirely of low, level, cultivated land, dotted with houses and backed by trees. There is a shoal off this point, and vessels must not approach it nearer than four hundred yards.

On the southern side of the harbor, about one mile to the southwestward of Hay Beach Point and directly opposite to Greenport, is Dering's Point, the eastern point of entrance to a large but shallow cove penetrating the northern shore of Shelter Island and known as **Dering's Harbor**. The shore between Hay Beach Point and Dering's Point has steep faces, but is not high, and is covered with thick woods except in the vicinity of the **Man-hasset House**.—a handsome summer hotel, situated close to the beach a little to the eastward of the point. **Dering's Point** is of moderate height, somewhat steep to the northward and westward and well wooded. Dering's Harbor is half a mile wide at its mouth and retains the same width to its head, half a mile to the southward, where it divides into two small and shallow streams

of no importance. It is not safe for strangers to attempt to enter it. The western point of entrance to the harbor is called **Ferry Point**, from the ferry dock which exists on its northern end. A boat plies regularly between this dock and **Greenport**. The point is the northeastern extremity of **Hill's Point**, a somewhat high wooded peninsula with precipitous faces to the westward and bold-to. A prominent feature on **Hill's Point** is the tall observatory of openwork, which stands on the summit of the bluff and is daily visited during the summer season,—the ferry-boat carrying passengers at regular intervals. Between this point and **Fanning's Point** on the north begins the northern part of **Shelter Island Sound**,—the name given to all that body of water which lies on the northern side of **Shelter Island**, on its western side, and on its southern side to the westward of **Sag Harbor**. This northern part is almost entirely unobstructed and has water sufficient for the largest vessels.

One mile and a half to the southwestward of **Ferry Point** is **Rocky Point**, the western point of **Shelter Island** and the southern point of entrance to **Southold Bay**. It has steep bluff faces, with level summit, cleared near its northern end but backed by woods. Between this point and the ferry dock the **Shelter Island** shore is bold-to and may be approached anywhere within two hundred yards with not less than four fathoms. **Rocky Point** should, however, receive a berth to the southward of not less than four hundred yards as it is somewhat shoal and has a number of outlying rocks.

On the northern side of the **Sound**, one mile to the southwestward of **Fanning's Point**, is **Conkling's Point**, formerly called **Albertson's Point**; and between the two is a wide cove called **Pipes' Cove**, in which anchorage may be found in from three to four fathoms. This cove can, however, be entered by keeping close to **Fanning's Point** after rounding the red buoy off **Fanning's Point Shoal**. **Conkling's Point** is the northern point of entrance to **Southold Bay** and is bold-to,—seven fathoms being found within one hundred and fifty yards of the shore. The channel between it and **Rocky Point**, though but a quarter of a mile wide, is entirely unobstructed and quite deep,—thirteen and fourteen fathoms being found in it. The point itself is low, level and grassy, and dotted with trees in clumps.

Southold Bay is that wide portion of **Shelter Island Sound** which extends from **Rocky Point** to **Hallock's Point**, (the northern extremity of **Great Hog Neck**,) one mile and a quarter to the southward. At its widest part it is one mile and seven-eighths from shore to shore, and affords an unobstructed and land-locked anchorage from six hundred yards to one mile in width with a depth of from four to twelve fathoms. Its northern shore from **Conkling's Point** to **Hashanomuck Point** (one mile to the westward) has a general course about **W. $\frac{1}{2}$ N.**; but between the two there is formed by the curve of the shore opposite **Rocky Point** a deep bight, in which there is good anchorage in from two to five fathoms. The shore is all low, level and under cultivation, with occasional steep faces and dotted with houses. **Hashanomuck Point** is a somewhat round hillock of moderate height, with steep face to the southward and covered only with grass. There are several outlying rocks off the point and beyond this shoal water, so that vessels should not approach nearer than a quarter of a mile. This point is the eastern point of entrance to a large pond called **Hashanomuck Pond**, which is cut off from the bay by a mill-dam three hundred yards above the entrance.

From this entrance the western shore of the bay has a general course **SW. $\frac{1}{2}$ S.** for one mile and three-eighths to the entrance to a very shallow cove of irregular shape called **Southold Harbor**, on the banks of which is situated the village of **Southold**. The shore is all low and nearly level, under fine cultivation, and thickly dotted with houses. The entrance to **Southold Harbor** is but thirty yards wide, between a long narrow sand spit on the north and a wooded point with steep faces on the south. Just inside the entrance and exactly in the middle of the passage is a marshy islet about two hundred yards long. The entrance is nearly dry at low water and the harbor itself is of no importance,—being fit only for small boats. There is another shallow cove or lagoon just to the southward of **Southold Harbor**, the entrance to which is but twenty yards wide, and which is likewise of no importance. From this lagoon the shore trends away **E. by S.** for nearly one mile and a half to **Hallock's Point**, forming the northern side of **Great Hog Neck**, and showing nearly level cultivated land at its eastern and western ends, separated by thick woods in the centre of the neck.

All of this western shore of **Southold Bay** is quite foul and should receive a berth to the westward of not less than nine hundred yards, except off the entrance to **Southold Harbor**, where you must not come nearer than five-eighths of a mile.

Hallock's Point is a long, low, sandy point, and forms the northeastern extremity of **Great Hog Neck**, on the southern side of which begins **Little Peconic Bay**. A shoal makes off from the point about one hundred yards and is marked by a red spar-buoy. Between this buoy and the eastern shore of the **Sound** the distance is about seven hundred yards with an entirely unobstructed channel in which from four to twelve fathoms is found.

The eastern shore of **Southold Bay** has a general course about **S. by E. $\frac{1}{2}$ E.** for one mile and three-eighths from **Rocky Point** to **Crab Creek**, (opposite to **Hallock's Point**,) and may be approached anywhere within six hundred yards with not less than four fathoms. It is diversified with cleared fields and woods and dotted at intervals with houses.

Crab Creek. **Crab Creek** is in reality not a creek but a cove, with an entrance twenty yards wide and a bold shore,—four fathoms being found within fifty yards of the entrance. The channel is unobstructed between this creek and **Hallock's Point** and has from four to twelve fathoms in it. The **Sound** now widens out and extends to the southward into **Noyack Bay** and to the southwestward into **Little Peconic Bay**.

From **Crab Creek** to **West Neck Point** the eastern shore of the **Sound** has a general course **SE. $\frac{1}{2}$ E.** for about one mile and a quarter, forming the shore of **West Neck**, and is composed of alternate wooded and cultivated lands. At **West Neck Point** it turns abruptly to the northeastward, forming a narrow sand beach half a mile long in

NE. $\frac{1}{2}$ E. direction,—the northeastern end of which is the western point of entrance into West Neck Harbor. All of this part of the shore is flat and vessels of greater draught than fifteen feet must be very careful in approaching it. A good rule is, when past the mouth of Crab Creek, to steer nearly for the northern end of Jessup's Neck, which will clear the western end of the flats; but a buoy will be recommended to be placed upon these flats, which will obviate all difficulty.

Great Hog Neck is a peninsula, about one mile and five-eighths long and one mile and a quarter wide, separating Southold Bay from Little Peconic Bay. It is for the most part composed of level cultivated lands thickly dotted with houses and showing occasional groves of trees. It is shoal on its eastern and southern sides, and **Great Hog Neck.** must not be approached, by vessels passing into Little Peconic Bay from Southold Bay, nearer than three-quarters of a mile.

The eastern entrance to the southern part of Shelter Island Sound is between Mashomuck Point on the north and Russel's Neck on the south. The former is the southeastern extremity of Shelter Island and is composed of low, flat, sandy land dotted with occasional houses. It is comparatively bold-to and may be safely approached within three hundred yards with not less than three and three-quarter fathoms. **Hog Neck**, on the western side of the approach, is composed of low and nearly level country, diversified with houses, woods and cultivated fields. The passage between the neck and Mashomuck Point is nearly one mile wide, but is so much obstructed by rocks and ledges as to render it impossible, although well buoyed, for a stranger to enter. There are many of these dangers in the approaches to the Sound, but they are well buoyed and not to be feared. **Mashomuck Point.**

Sag Harbor lies at the southwestern end of the approach to Shelter Island Sound from the eastward. The town of **Sag Harbor** has about four thousand inhabitants, principally engaged in coastwise trade and some interest in the whale-fishery. A narrow and crooked channel with not less than ten feet at low water leads up to the wharf-line of the town; but it is not advisable for strangers to attempt to enter without a pilot. The entrance to the harbor is between Mashomuck Point on the north and **Barcelona Point** (the northwestern extremity of Russel's Neck) on the south. It is nearly seven-eighths of a mile wide, but is much obstructed by shoals,—principal among which are **Barcelona Bank** (which extends to the westward from the point of that name for nearly three-quarters of a mile and is marked by two black spar-buoys) and **The Sand Spit**, which extends in a northwesterly direction for one mile and a half with not less than five feet, and is marked by an iron spindle painted red, which serves as a guide to the main channel. **Sag Harbor.**

On the eastern side of the approach to Sag Harbor the shore has a general course **SW.** by **S.** $\frac{1}{4}$ **S.** for nearly two miles to **West Harbor**, a shallow cove of no importance making in between the eastern shore and Russel's Neck. Nearly the whole of the bight between Cedar and Barcelona points is flat; and it is not safe for vessels to stand to the eastward of Cedar Island Light-house bearing **N.** by **E.** $\frac{1}{4}$ **E.** until they are up with the black buoy off the entrance to West Harbor.

Russel's Neck has a somewhat undulating surface, from eighty to one hundred feet high, and is for the most part thickly wooded. Shoals make off from Barcelona Point, its northwestern point, for a long distance, and are marked by spar-buoys,—the channel here being extremely narrow. There are also long reefs making off to the northward from the Sag Harbor shore which, though well buoyed, render a safe approach to the harbor extremely difficult. **Russel's Neck.**

Abreast of Sag Harbor the Shelter Island Sound channel turns abruptly to the northward, running nearly **NW.** for about one mile and three-quarters between Shelter Island on the east and Hog Neck on the west. At its narrowest part this passage is five-eighths of a mile wide, and nineteen feet at low water can be taken through it; but it is so much obstructed by The Sand Spit and other shoals as to render its navigation extremely dangerous for strangers. The eastern side of the passage is formed by level land, partly wooded and partly cultivated.

At the northern end of Hog Neck the channel turns abruptly to the westward,—running **W.** by **S.** between the southern shore of Shelter Island and the northern end of Hog Neck with a depth of not less than twenty-two feet at low water and a width of not less than six hundred yards. Both shores are level and under cultivation; but the north shore is indented by a large shallow cove of irregular shape known as **West Neck Harbor**. It is of no importance,—having less than six feet at low water,—and requires the assistance of a local pilot to enter it. At its western end it receives the waters of **West Neck Creek**, very shallow and irregular in outline, which penetrates the southern part of Shelter Island to within three-eighths of a mile of the northern passage into the Sound. **West Neck Harbor.**

On the western side of Hog Neck, and between it and Jessup's Neck, is contained **Noyack Bay**, two miles and an eighth wide **E.** and **W.** and one mile and five-eighths long **N.** and **S.** It is unobstructed outside of the line of three fathoms, and good anchorage is found in it in from three to seven fathoms, entirely land-locked. The small village of **Noyack** lies at the southwestern end of the bay; but there is no water communication except by small boats. **Noyack Bay.**

Jessup's Neck, which forms the western shore of Noyack Bay, is a long narrow peninsula, partly wooded, and terminating to the northward in a narrow, flat, sandy point. Off this point is a shoal marked by a black buoy; and should this be gone the point must receive a berth to the southward of not less than a quarter of a mile. The eastern entrance to Little Peconic Bay is between Jessup's Neck and the southeastern extremity of **Great Hog Neck**, (before described,) and is three-quarters of a mile wide; but the available channel between the lines of three fathoms is not more than nine hundred yards wide. **Jessup's Neck.**

Little Peconic Bay. Little Peconic Bay is in reality a Sound and extends in a southwesterly direction for five miles and a quarter. It is very irregular in shape,—its northern shore being very much indented, and the width of the bay varying from three-quarters of a mile at its eastern and western ends to four miles in the bight between Little Hog Neck and Great Hog Neck. From three to seven fathoms is found in it and the channel is entirely unobstructed, affording beating room for the largest vessels; but it is well not to approach the north shore, as long shoals make off from Great Hog Neck with from seven to twelve feet at low water. There is good water in the bight between Great and Little Hog necks and sheltered anchorage with from three to four fathoms; but in the absence of a buoy on the western end of **Great Hog Neck Shoal** it is not safe to enter it without a pilot.

Little Hog Neck. Little Hog Neck is a narrow peninsula two miles long, extending in a southerly direction on the north side of Little Peconic Bay, three miles and three-eighths to the southwestward of Great Hog Neck. It is of moderate height, with steep faces to the eastward, and for the most part wooded, but terminates in a flat sandy point, off which there is a shoal marked by a red spar-buoy. On the west side of the neck is what is known as **Cutchogue Harbor**, a large shallow cove of irregular shape embraced between the neck and New Suffolk Peninsula, and in which anchorage may be found in twelve feet at low water, sheltered from all winds; but this harbor cannot be entered without a pilot. At its head this harbor receives the waters of a shallow creek called **Cutchogue Creek**, which leads up to the village of **Cutchogue**, one mile and a quarter inland.

New Suffolk Peninsula is of moderate height, nearly level, and almost entirely occupied by the village of the same name. It is the northern point of the entrance to Great Peconic Bay, which is here connected with Little Peconic Bay, and extends to the westward about five miles and a half. Not more, however, than fourteen feet at low water can be taken into this bay.

The eastern shore of Little Peconic Bay runs about **SW. $\frac{1}{4}$ S.** for three miles and five eighths to the entrance to North Sea Harbor and then about **W. $\frac{1}{2}$ N.** to Cow Neck, the southern point of entrance to Great Peconic Bay. **North Sea Harbor.** Between Jessup's Neck and North Sea Harbor the shore is for the most part slightly undulating, wooded, and showing occasional steep faces about twenty feet high. North Sea Harbor is a very shallow cove of irregular shape, with an entrance about fifty yards wide between two low sandy points, and entirely unfit for strangers, however light their draught. Its shores are low, nearly level, and highly cultivated.

Cow Neck is a flat sandy point covered with grass and backed by woods, and has a black spar-buoy about half a mile to the northeastward of it, marking the northern point of **Cow Neck Flats** and the southern point of entrance to Great Peconic Bay. Exactly midway between this neck and the New Suffolk Peninsula lies **Robbins' Island**, in the middle of the entrance to Great Peconic Bay and dividing the approach into two channels,—each of which has not less than fourteen feet at low water. This island lies nearly **N. by W.** and **S. by E.** and is one mile and three-quarters long; but a large portion of its length is due to the narrow sand spits which extend to the northward and southward from the main body of the island. It is of moderate height and grassy, destitute of trees, and shows steep faces from ten to twenty feet high to the eastward, southward and westward. It is surrounded by shoals, which extend to the northeastward three-quarters of a mile with less than twelve feet, to the southward three hundred yards with less than six feet, and to the southwestward one mile and a quarter with nine feet; and vessels must be careful, therefore, to give it a good berth. There is an equally good channel on its northern and southern sides, but it is usual to pass to the southward of it, where the shoals are buoyed. The available channel between the lines of two fathoms is, on the southern side, a quarter of a mile wide, and on the northern side an eighth of a mile wide.

(Great Peconic Bay is, as before remarked, nearly circular, about five miles in diameter, and has a depth of from three to four fathoms covering an area of about three miles and a half,—the rest of the bay being occupied by flats. On its northern shore are the villages of **New Suffolk, Mattituck, Franklinville, Jamesport**, (with its suburb of **Old Aquebogue**.) and **Upper Aquebogue**, which is situated about one mile inland. On its southern shore, near its western end and directly opposite Jamesport, is the village of **Southport**, and at its western end, at the head of Peconic River, is the village of **Riverhead**.) Both shores are slightly undulating but low, and diversified with alternate cleared fields and groves of trees. The greatest diameter of the bay is five miles and a quarter, its least, between the northern end of Robbins' Island and New Suffolk, eight hundred yards, and between the southern end of the former and **Cow Neck** it is three-quarters of a mile wide. It is also three-quarters of a mile wide at its western end, between Jamesport and **Southport Point**.

Southport Point is a long, flat, sandy point, extending in a northwesterly direction from the mainland for half a mile, and having a long flat making off from it to the northward for twelve hundred yards,—that is, to within three hundred yards of the Jamesport shore. This shoal has from two to four feet upon it, and its northern end is marked by a black spar-buoy, leaving a channel an eighth of a mile wide with ten feet at low water between the buoy and the northern shore. **Southport Point.** (There is also a red spar-buoy four hundred yards to the eastward of the black spar-buoy, which marks the southern extremity of the flats off Jamesport,—the channel passing between the two buoys. After passing to the westward of these buoys the bay spreads away to a width of one mile, then suddenly contracts to three-quarters of a mile, and finally terminates, two miles to the westward of Jamesport, at the mouth of **Peconic River**,—a shallow stream two miles long leading to the village of **Riverhead**.) There is no navigation except for the smallest vessels to the westward of Jamesport.

DANGERS

IN APPROACHING AND ENTERING GARDINER'S BAY.

I. *From the Eastward, bound to Greenport Harbor and the Peconic Bays.*—In approaching this bay from the eastward, when abreast of Little Gull Island Light-house you will see nearly ahead, bearing about **W.** and three-quarters of a mile off, a spar-buoy painted red and black in horizontal stripes. This buoy is placed near a *twenty-two feet rock* nine hundred yards to the southward of Constellation Rock, which has twenty-one feet at low water. Constellation Rock bears from Little Gull Island Light-house **S.** by **W.** $\frac{1}{4}$ **W.**, distant one mile and three-quarters, and from Gardiner's Island Light-house **NE.** $\frac{1}{2}$ **E.**, distant two miles and a half. The buoy bears from Little Gull Island Light-house **S.** by **W.** $\frac{1}{4}$ **W.**, distant two miles and a quarter, and from Gardiner's Island Light-house **NE.** $\frac{3}{4}$ **E.**, distant two miles and an eighth. The sailing-line passes to the southward of it, by which all danger is avoided.

*Constellation
Rock.*

When past this buoy the channel is clear, but if beating to windward you must not stand farther to the northward than to bring Prospect Hill (on the southern side of Fisher's Island) to bear **NE.** by **E.** $\frac{1}{2}$ **E.** in order to avoid Bedford Reef, an extensive shoal half a mile long **E.** and **W.** and about eight hundred yards **N.** and **S.**, with from thirteen to eighteen feet at low water. It is not buoyed, and as the flood tide sets with great velocity directly towards it great care must be taken in order to avoid it. If Long Beach Point light is visible the shoal is easily avoided by not going to the northward of that light bearing **W.** by **S.** $\frac{3}{4}$ **S.**

Bedford Reef.

In standing to the southward it is well not to approach Gardiner's Point nearer than a quarter of a mile if of greater draught than fifteen feet, but small vessels may shave the point closely,—being careful only to keep in the strength of the tide and avoid the eddies.

On the Plum Island shore you must look out for Plum Island Rock, which lies off the southern shore of the island at a distance of half a mile and about midway between Plum Island Point and Pine Point. The rock is awash at low water and is marked by a red spar-buoy (No. 2) placed in three fathoms on its southern side. It bears from Little Gull Island Light-house (which will be just on with the southern side of Great Gull Island) **W.** by **S.** $\frac{1}{8}$ **S.**, distant over three miles and three-quarters; from Plum Island Point **SW.** $\frac{1}{2}$ **W.**, distant one mile and a quarter; and from Gardiner's Island Light-house **NW.** by **N.** $\frac{1}{2}$ **N.**, distant two miles and three-eighths. From this buoy the perpendicularly-striped buoy off Long Beach bears **SW.** $\frac{1}{2}$ **W.**, distant five miles and three-quarters, and the red buoy at the entrance to Sag Harbor **SW.** by **S.** $\frac{1}{2}$ **S.**, distant seven miles and three-eighths. When to the westward of this buoy the entrance is clear,—only you must not stand into the tideway of Plum Gut.

*Plum Island
Rock.*

In approaching the northern shore between Oyster Pond Point and Ben's Point give it a berth to the northwestward of about one mile, or, in other words, do not stand to the northward of Pine Point (the southwestern extremity of Plum Island) bearing **NE.**; or, if it can be seen, Little Gull Island Light-house bearing **NE.** by **E.** $\frac{1}{2}$ **E.** This will avoid the shoals which make off from the Oyster Pond Peninsula with a depth of from eight to fourteen feet.

Long Beach Point must receive a berth to the northwestward of not less than one mile and three-eighths to avoid Long Beach Shoal, which makes off in a **SE.** direction for one mile and a quarter. Vessels of less draught than fourteen feet may, however, pass within three-quarters of a mile of the beach with not less than sixteen feet at low water. A quarter of a mile to the southeastward of this shoal, in four fathoms water, is placed a spar-buoy painted black and white in perpendicular stripes to mark the entrance to Greenport Harbor,—Long Beach Point Light-house bearing **NW.**

*Long Beach
Shoal.*

by **W.** $\frac{3}{4}$ **W.**, distant two miles and an eighth. Vessels must make this buoy and pass close to it, whence the course is towards the highest part of Hay Beach Point, the northern end of Shelter Island. Just to the southward of this buoy is placed a spar-buoy painted red and black in horizontal stripes, marking the site of a sunken wreck. This part of the channel, though deep, is narrow,—being obstructed by extensive flats on both sides; and great care is necessary to avoid getting ashore, as the shoals are in some places quite steep-to. On the northern side of the passage Long Beach Point must receive a berth of seven-eighths of a mile, as twelve feet is found on the flats five-eighths of a mile to the southward of the point, and no directions can be given for avoiding them other than to keep the lead constantly going and on no account to stand into less than four fathoms.

On the southwestern side of the passage, from Ram Head to Hay Beach Point, the shore is very foul,—flats extending off to the northeastward in some places one mile and an eighth from shore; and twelve feet is found seven-eighths of a mile to the northward of Ram Island. These flats are not buoyed, and in order to avoid them you must keep the lead well in hand and not stand into less than three and a quarter fathoms.

When within half a mile of Long Beach Point Light-house, which marks the western extremity of Long Beach Point Shoal, a black spar-buoy (No. 1) will be seen to the northward of the course, bearing about **NW.** $\frac{3}{4}$ **W.** and three-quarters of a mile off. This is on the northern end of Hay Beach Point Flats and the sailing-line passes to the eastward

*Hay Beach
Point Flats.*

of it, about midway between it and the light-house. This buoy bears from the perpendicularly-striped buoy at the entrance **W NW**. **Westerly**, distant about two miles and five-eighths, and from Long Beach Point Light-house **W. $\frac{1}{8}$ N.**, distant nearly nine hundred yards.

The light-house marks the western extremity of Long Beach Point Shoal, which extends from that point in a **SW**. by **W. $\frac{1}{4}$ W.** direction for eight hundred and fifty yards, is bare at low water for three hundred and fifty yards, has six feet at low water nine hundred yards from the point and only seven feet two hundred yards from the light-house. When abreast of the light-house, *if bound into Orient Harbor*, the course turns abruptly to the northward—running about **N. $\frac{1}{4}$ E.**—and you must look out on the western side of the entrance for *Cleaves' Point Shoal*, which makes off from that point to the eastward for one mile with from seven to twelve feet at low water. It is not buoyed, and to avoid it vessels should not when in its vicinity stand to the westward of Long Beach Point Light-house bearing **SE**. by **S. $\frac{1}{2}$ S.**

Off Hay Beach Point will be seen a red spar-buoy, which marks the Sheep Head Rocks and is usually left to the northward. Sheep Head Rocks are a detached group, with three feet at low water upon them, lying off Cleaves' Point. The buoy, which is marked No. 2, is placed **S SE**. from them in three fathoms,—Long Beach Point Light-house bearing **E**. by **S. $\frac{3}{4}$ S.** and Hay Beach Point **S**. by **W. $\frac{1}{2}$ W.** The sailing-line passes well to the southward of the buoy, (as Hay Beach Point is quite bold-to on its northern side,) and the channel now turns to the southwestward with Conkling's Point in range with the western end of the woods on Rocky Point.

On this course you will see to the northward, bearing about **W**. by **S. $\frac{3}{4}$ S.** and three-quarters of a mile off, another red spar-buoy. This is on the southern end of Greenport Flats, which extend about **SE**. by **S. $\frac{3}{4}$ S.** for a quarter of a mile from the eastern point of entrance to Stirling Basin and have three feet at low water an eighth of a mile from shore. The buoy, which is marked No. 4, is placed on their southern end in eighteen feet, and bears from Hay Beach Point **W**. by **S. $\frac{1}{4}$ S.**, a little over five-eighths of a mile, and from the eastern point of entrance to Stirling Basin **SE**. by **S. $\frac{3}{4}$ S.**, a little over a quarter of a mile distant. When past it you may anchor anywhere between the Greenport shore and Dering's Point,—only being careful to give the latter a berth of three hundred and fifty yards as it is somewhat shoal.

But, if intending to enter Shelter Island Sound, continue the course to the southwestward towards Conkling's Point, and when off Dering's Point a red spar-buoy will be seen to the northward of the course, bearing about **W SW**. and distant nearly twelve hundred yards. This is on Fanning's Point Shoal, which makes off to the southeastward from Fanning's Point for an eighth of a mile. The buoy is marked No. 6, placed in sixteen feet off the southern end of the shoal, and bears from the red buoy on Greenport Flats **SW. $\frac{1}{2}$ W.**, distant nearly one mile, and from Hay Beach Point **SW**. by **W. $\frac{1}{4}$ W.**, distant one mile and a half. When past this buoy both shores are bold-to and you may keep in the middle of the passage,—only observing to give Rocky Point a berth of three hundred yards to the southeastward on entering Southold Bay.

The course now turns a little to the eastward of **S.** (say **S**. by **E. $\frac{1}{2}$ E.**) and keeping the eastern shore of Southold Bay best aboard until you are within half a mile of Hallock's Point, when a red spar-buoy (No. 8) will appear off that point bearing about **S. $\frac{1}{4}$ E.** and half a mile distant. This is on Hallock's Point Shoal and is distant from the point only about one hundred yards. The sailing-line passes to the eastward of it; but you must be careful after passing it to keep in the middle of the passage until you can see the black spar-buoy off Jessup's Neck, as both shores are shoal. *Shoal water makes off to the eastward from Great Hog Neck* for thirteen hundred yards with twelve feet; and from *West Neck to the westward* for nearly one mile with sixteen feet,—the latter shoal obstructing the entrance to Noyack Bay. There should be a buoy on the southwestern end of this shoal,—the present buoy being half a mile to the eastward of it; and such change will be recommended.

When about three-quarters of a mile to the southward of Hallock's Point the course turns to the southwestward, and there will soon be seen off Jessup's Point, a little to the southward of the course, bearing about **S SW**. and half a mile off, a black spar-buoy. This is on the northern end of Jessup's Neck Shoal, which makes off in a northerly direction for three hundred yards and has less than twelve feet an eighth of a mile to the northward of the northern end of the neck. The buoy, which is marked No. 3, is placed in three fathoms and bears from Hallock's Point Shoal **S. $\frac{1}{2}$ W.**, distant one mile and five-eighths.

The sailing-line into Little Peconic Bay passes to the westward of buoy No. 3, and when abreast of it a red spar-buoy will be seen well to the northward of the course, bearing about **SW**. by **W. $\frac{1}{2}$ W.** and seven-eighths of a mile off. This is on Great Hog Neck Shoal, a very extensive piece of shoal ground making off to the southwestward from Great Hog Neck for nearly one mile and three-quarters, with not more than seven feet at low water one mile and three-eighths **SW. $\frac{1}{2}$ W.** from the neck. The buoy is marked No. 10, placed in fifteen feet at low water on the eastern side of the shoal, and vessels of greater draught than fifteen feet should

give it a berth to the westward of not less than eight hundred and fifty yards,—passing it in six fathoms.

The eastern shore of Little Peconic Bay is comparatively bold-to, and you may approach Jessup's Neck within three-eighths of a mile and the shore between Jessup's and Cow necks within half a mile with not less than four fathoms at low water. *If bound into the bight between Great Hog Neck and Little Hog Neck* you must keep the latter shore aboard, passing within half a mile of it, and continuing to the northward until you see a red spar-buoy about three-eighths of a mile from the northern shore. This is the "Anchoring Buoy," and vessels may carry eighteen feet at low water up to it. *But, if bound through into Great Peconic Bay*, you must look out when off Little **Little Hog Neck Shoal.** Hog Neck for Little Hog Neck Shoal, which makes off to the southward from that neck for seven hundred yards, and is marked by a red spar-buoy (No. 12) placed in two fathoms,—the northern extremity of Jessup's Neck bearing **NE. $\frac{3}{4}$ E.**, distant three miles and five-eighths, and the southern extremity of Great Hog Neck bearing **N. $\frac{3}{4}$ E.**, distant six hundred and fifty yards. This buoy marks also the eastern point of entrance to Cutchogue Harbor and may be rounded at a distance of one hundred yards by vessels bound into that harbor. Vessels must not, however, attempt to enter this harbor without a pilot unless they are of less than ten feet draught, in which case they may pass safely in by giving the Little Hog Neck shore a berth to the eastward of about a quarter of a mile, when they will have not less than eleven feet at low water.

When abreast of the red buoy on Little Hog Neck Shoal a black spar-buoy will be seen to the southward of the course, bearing **SW.** by **S. $\frac{1}{4}$ S.**, and about one mile off. This is on the northern end of Cow Neck Flats, which make off from Cow Neck about **N.** by **E.** for twelve hundred yards and have less than twelve feet upon them at low water. The buoy, which **Cow Neck Flats.** is marked No. 5, is placed in two fathoms on the northern end of the flats, and bears from the red buoy on Little Hog Neck Shoal **S.** by **W. $\frac{1}{2}$ W.**, distant one mile and a quarter. From this buoy the southern end of Robbins' Island bears **W. $\frac{1}{2}$ N.**, distant five-eighths of a mile, and the perpendicularly-striped buoy in the entrance to Great Peconic Bay **SW.** by **W. $\frac{3}{4}$ W.**, distant one mile and five-eighths.

Between Cow Neck and Robbins' Island the passage is three-quarters of a mile wide, but is closed by a bar, across which not more than fourteen feet at low water can be taken. The channel is but four hundred yards wide, and to guide vessels in crossing the bar a spar-buoy painted white and black in perpendicular stripes has been placed in thirteen feet about six hundred yards to the southward of Robbins' Island West Flats. By passing either to the northward or southward of this buoy close-to you will not have less than fourteen feet.

Robbins' Island West Flats extend about **SW.** from that island for one mile and a quarter with nine feet at low water, and are not marked except by the striped buoy above mentioned. Vessels beating in Great Peconic Bay may avoid them by giving the island a berth to the eastward of one mile and three-eighths, where they will pass in three and a quarter fathoms.

In Great Peconic Bay there are no obstructions and vessels may stand from shore to shore by simply using the lead with care and not standing into less than sixteen feet, as the water shoals gradually on both shores. *If bound to Jamesport* they must, when abreast of the perpendicularly-striped buoy at the entrance to the bay, steer to the westward, (say about **W. $\frac{1}{4}$ N.**), on which course there will soon be seen, bearing about **NW.** by **W. $\frac{3}{4}$ W.** and half a mile off, a red spar-buoy. This is on **Aquebogue Flats.** Aquebogue Flats, which make off from the northwestern shore of the bay just to the eastward of Jamesport Entrance, and have less than five feet seven-eighths of a mile from shore. The buoy, which is marked No. 14, is placed in two fathoms on the southeastern edge of the flats and bears from the perpendicularly-striped buoy at the entrance to the bay **W. $\frac{1}{4}$ N.**, distant three miles and a half. When up with this buoy the course turns slightly to the northward and there will be seen nearly ahead, but a little to the southward of the course, a black spar-buoy, and a red spar-buoy directly ahead. The latter, which must be left to the northward, is on the southern side of the *Jamesport Flats*, which make off to the southeastward from the wharf-line of the village a quarter of a mile. The former is on *Southport Flats*, a very extensive sand spit with from three to five feet water upon it, which makes off from Southport Point to the northward for five-eighths of a mile. The sailing-line passes between the two buoys; and here the channel is very narrow,—its width between Southport Flats buoy and the wharf-line of Jamesport being only about three hundred yards with a depth of thirteen feet.

Beyond this no description of dangers or sailing directions can be given.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING GARDINER'S BAY.

I. *From the Eastward, bound to Greenport Harbor and the Peconic Bays.*—1. *Having come through the Main Channel of Block Island Sound.*—On the **W.** Northerly course through Block Island Sound, (see page 384,) when Watch Hill Light-house bears **N.** by **E. $\frac{3}{4}$ E.**, distant three miles and three-quarters, Race Rock Light-house **W. $\frac{3}{4}$ N.**, seven miles and seven-eighths, and Little

Sailing Direc- Gull Island Light-house **W. $\frac{1}{4}$ S.**, distant ten miles and three-quarters, you will have
tions--Gard- nineteen fathoms and must steer **W. by S. $\frac{1}{4}$ S.** for fourteen miles, until Gardiner's Island
iner's Bay. Light-house bears **SE. $\frac{3}{4}$ E.**, about one mile, and Plum Island Light-house **NW. $\frac{1}{4}$ W.**,
nearly three miles distant. Here the depth will be seven fathoms, and you must steer
SW. $\frac{1}{8}$ W. into the bay, carrying not less than five fathoms, until Long Beach Point Light-house bears
W NW. and Gardiner's Island Light-house **NE. by E. $\frac{1}{4}$ E.** Here you will have five and a half fathoms
and **W. by N. $\frac{1}{4}$ N.** will lead to the perpendicularly-striped buoy off Long Beach Shoal. When up with
this buoy continue the course towards the highest part of Hay Beach Point until Long Beach Point Light-
house bears **N. by W. $\frac{1}{4}$ W.**, distant half a mile, and the point itself **NE. by N. $\frac{3}{4}$ N.**, distant seven-eighths
of a mile, where you will have ten fathoms and must steer **NW. $\frac{3}{4}$ N.** for about seven-eighths of a mile,
or until the northern end of Hay Beach Point bears **W. $\frac{3}{4}$ S.** Now steer **W. $\frac{1}{4}$ N.**, carrying not less than
four and a quarter fathoms, until you come abreast of the red spar-buoy on the Sheep Head Rocks and
have the middle of Hay Beach Point bearing **S. $\frac{1}{4}$ W.** Now steer **SW. $\frac{3}{4}$ W.** and anchor off the town
of Greenport in from eight to thirteen fathoms; but, *if bound into Southold Bay or the Peconic Bays*,
when Dering's Point bears **S. by E. $\frac{3}{4}$ E.** and Fanning's Point **W. by S. $\frac{3}{4}$ S.**, steer **SW. $\frac{1}{4}$ W.** for three-
quarters of a mile, or until you come abreast of Fanning's Point Shoal buoy and the ferry on the
Hill's Point shore. Hence the course is **SW. $\frac{1}{4}$ W.** until you come abreast of Conkling's Point, after
which it turns to the northwestward, (say about **NW. by W. $\frac{3}{4}$ W.**.) keeping in mid-channel and
rounding Rocky Point at a distance of a quarter of a mile. As soon as you bring Hallock's Point to
bear **S. $\frac{3}{4}$ E.**, distant one mile and a quarter, steer **S. by E. $\frac{3}{4}$ E.**, carrying not less than five and a half
fathoms, until the southern extremity of West Neck bears **E. $\frac{3}{4}$ S.** and Jessup's Point **S. by W. $\frac{3}{4}$ W.**
Now, *if bound into Noyack Bay*, continue the course to the southward and anchor in from three to
four fathoms, at your discretion. But, *if bound into Little Peconic Bay*, when the southern end of
West Neck bears **E. $\frac{3}{4}$ S.** and the northern extremity of Jessup's Neck **S. by W. $\frac{3}{4}$ W.**, as before, steer
SW. by S., carrying not less than six fathoms, until you come abreast of the red spar-buoy on Great
Hog Neck Shoal and the southern extremity of Little Hog Neck bears **SW. by W. $\frac{1}{8}$ W.** Now, if
bound through and into Great Peconic Bay, steer **SW. $\frac{1}{4}$ W.**, crossing the bar in fourteen feet at low
water; but *if intending to anchor in the bight between Great and Little Hog necks*, when the southern
extremity of the latter bears **W. by S. $\frac{3}{4}$ S.**, distant one mile and an eighth, and the southern extremity
of the former **NE. by N.**, distant two miles and five-eighths, steer **NW. by N. $\frac{1}{4}$ N.**, which will lead
to the anchorage. Or, *wishing to enter Cutchoque Harbor and New Suffolk*, when on the **SW. $\frac{1}{4}$ W.**
course you come abreast of the red spar-buoy (No. 12) on Little Hog Neck Shoal and the northern
end of Robbins' Island bears **W. by N. $\frac{1}{2}$ N.**, steer that course for six hundred yards, or until the
southern extremity of Little Hog Neck bears **N. by E. $\frac{3}{4}$ E.**, distant half a mile. Now steer **NW. by**
N. $\frac{1}{2}$ N. for seven-eighths of a mile, carrying not less than three and a quarter fathoms, until the
southern extremity of the peninsula upon which New Suffolk is built bears **W. by N.**, when **W. $\frac{1}{4}$ N.**
will lead safely to the anchorage off the village. But *if bound into Great Peconic Bay* you may con-
tinue the **SW. $\frac{1}{4}$ W.** course after crossing the bar, and anchor at discretion on the southern side of the
bay in from three to four fathoms. Or, *if bound to Jamesport*, you may, when abreast of the perpen-
dicularly-striped buoy off the southern end of Robbins' Island West Flats, steer **W. $\frac{1}{4}$ N.**, which
course will lead safely through the middle of the bay and with not less than thirteen feet water to the
anchorage.

The above courses pass two hundred yards to the southward of the striped buoy off Constellation
Rock; one mile and an eighth to the southward of Bedford Reef; five-eighths of a mile to the north-
ward of Gardiner's Point; a quarter of a mile to the southward of the southeastern end of Long Beach
Shoal; four hundred yards to the westward of Long Beach Point Light-house; three hundred yards
to the eastward and four hundred yards to the northward of Hay Beach Point Flats; two hundred
yards to the southward of the red buoy on Sheep Head Rocks; four hundred yards to the southward
of the red buoy on Greenport Flats; an eighth of a mile to the southeastward of the red buoy on
Fanning's Point Shoal; the same distance to the eastward of the red buoy off Hallock's Point; two
hundred yards to the westward of the black buoy off Jessup's Neck; seven hundred yards to the east-
ward of the red buoy off Great Hog Neck Shoal; the same distance to the eastward of the red buoy
off Little Hog Neck Shoal; six hundred and fifty yards to the northwestward of the black buoy off

Cow Neck Flats; an eighth of a mile to the eastward and four hundred yards to the southward of the perpendicularly-striped buoy off Robbins' Island West Flats; three hundred yards to the southward of the red spar-buoy off Aquebogue Flats; close-to to the southward of the red spar-buoy off Jamesport Flats; and about one hundred yards to the northward of the black spar-buoy off Southport Flats.

2. *To enter Gardiner's Bay from the North Channel of Block Island Sound.*—On the $W. \frac{1}{2} S.$ course from off Point Judith, (see page 396,) when Block Island North Light-house bears **SE.** South-erly, distant seven miles, and Watch Hill Light-house **W.** by **N.** $\frac{1}{4} N.$, about the same distance, you will have eighteen fathoms and **W.** by **S.** $\frac{1}{4} S.$ will lead to the entrance to the bay, carrying not less than six fathoms. On this course, when Gardiner's Island Light-house bears **SE.** $\frac{3}{4} E.$, nearly one mile, and Plum Island Light-house **NW.** $\frac{1}{4} W.$, nearly three miles distant, steer **SW.** $\frac{1}{4} W.$ into the bay and follow the directions given above.

The course for the entrance to the bay passes about two miles and three-eighths to the northward of the striped buoy on Cerberus Shoal and an eighth of a mile to the southward of the striped buoy off Constellation Rock.

3. *Having come through the passage between Block Island and Montauk Point, to enter Gardiner's Bay.*—On the **NW.** $\frac{3}{4} W.$ Westerly course through Block Island Sound, (see page 405,) when Montauk Point Light-house bears **S.** $\frac{1}{4} W.$, distant three miles and three-quarters, and Chocomaunt (on Fisher's Island) **N.** by **W.** $\frac{3}{4} W.$, distant nine miles and three-quarters, you will have about eleven fathoms and must steer **W NW.**, carrying not less than twelve fathoms, until Little Gull Island Light-house bears **NW.** $\frac{1}{4} N.$, distant four miles and a quarter, and Gardiner's Island Light-house **W.** $\frac{1}{4} S.$ Southerly, distant five miles and a quarter. Here you will have thirteen fathoms, and **W.** $\frac{1}{4} N.$ will lead with not less than nine fathoms to the entrance to the bay. On this course, when Gardiner's Island Light-house bears **SE.** $\frac{3}{4} E.$, distant about a mile, and Plum Island Light-house **NW.** $\frac{1}{4} W.$, distant two miles and a half, steer **SW.** $\frac{1}{4} W.$ and follow the directions given above.

DANGERS

IN APPROACHING AND ENTERING GARDINER'S BAY.

II. *From the Eastward, bound to Sag Harbor and thence to the Peconic Bays.*—When up with Gardiner's Point the channel is clear through the bay to the entrance to the harbor, but if standing to the eastward on a wind you should not go farther than to bring Gardiner's Island Light-house to bear **NE.** by **N.** or Plum Island Light-house **N.** $\frac{1}{4} W.$ in order to avoid Crow Shoal, a dangerous shoal making off from Crow Head (the western end of Gardiner's Island) **Crow Shoal.** in a **SW.** $\frac{3}{4} W.$ direction for nearly one mile and three-quarters. There is but six feet on this shoal one mile and three-eighths from shore, and eleven feet on its southwestern extremity, close to which is placed a spar-buoy painted red and black in horizontal stripes. This buoy bears from Plum Island Light-house **S.** $\frac{3}{4} E.$, distant five miles and seven-eighths; from Gardiner's Island Light-house **SW.** by **S.** $\frac{1}{2} S.$, four miles; and from the middle of Crow Head **SW.** by **W.** $\frac{3}{4} W.$, distant about one mile and five-eighths. From this buoy Ram Head bears **W.** $\frac{3}{4} N.$, a little over four miles and a half, and the Outer Bar Buoy of Sag Harbor **W.** by **S.** $\frac{1}{2} S.$, nearly three miles distant.

If standing to the westward do not approach Ram Head nearer than seven-eighths of a mile, nor the shore of Shelter Island, between Ram Island and Nichol's Point, nearer than two miles, in order to avoid Ram Island Flats, which extend from that island about **SE.** over one mile and a quarter with from seven to eleven feet at low water. Between the southern **Ram Island Flats.** end of these flats and Hedge's Banks (just to the eastward of Cedar Point) extends a fourteen feet bar known as *Sag Harbor Bar*, across which vessels must pass to enter the harbor. The channel is, however, well buoyed,—a red spar-buoy being placed on its northern side in sixteen feet, a black spar on its southern side in the same depth, and a striped buoy on an obstruction in the middle. The first named, which is marked No. 2 and known as "Outer Bar Buoy," bears from Plum Island Light-house **S.** by **W.** $\frac{1}{4} W.$, distant seven miles; from Gardiner's Island Light-house **SW.** $\frac{1}{4} W.$, six miles and a half; and from the striped buoy on Crow Shoal **W.** by **S.** $\frac{1}{2} S.$, distant nearly three miles. The black buoy, which is marked No. 1, is placed on the *northeastern* end of Cedar Point Shoal, about six hundred yards **SW.** by **S.** $\frac{3}{4} S.$ from the Outer Bar Buoy, and bears from Gardiner's Island Light-house **SW.** $\frac{1}{4} W.$, distant six miles and three-quarters, and from the striped buoy on Crow Shoal **W.** by **S.** $\frac{3}{4} S.$, distant three miles and an eighth. Cedar **Cedar Point Shoal.** Point Shoal makes off to the westward and northward from Cedar Point and has five feet on its northern end more than a quarter of a mile from shore and twelve feet just inside the buoy. On its western end, about seven hundred yards from Cedar Point, is built the light-house, already described on page 536. The striped buoy in the middle of the

entrance is placed close to a detached rock with nine feet upon it, called *Dangerous Rock*. The buoy is painted red and black in horizontal stripes, lies six hundred yards **E. $\frac{1}{4}$ N.** from the black buoy on the northeastern end of Cedar Point Shoal and the same distance **SE. by S.** from Outer Bar Buoy. You may pass on either side of it, but it is usual to pass to the northward. From this buoy the northern end of Ram Head bears **NW. Northerly**, a little over two miles and five-eighths; Nichol's Point **W. $\frac{1}{2}$ N.** Northerly, one mile and seven-eighths; and Cedar Island Light-house **W. by S. $\frac{3}{8}$ S.**, one mile and a half distant.

When up with the black spar-buoy on the northeastern end of Cedar Point Shoal another black spar will be seen bearing about **W. $\frac{3}{4}$ S.** and a little over half a mile off. This is on the *northwestern* end of Cedar Point Shoal, in thirteen feet water,—Cedar Island Light-house bearing **SW. by W.**, a little over five-eighths of a mile; the red buoy on Nichol's Point Shoal **W. by N. $\frac{1}{2}$ N.** Northerly, three-quarters of a mile; and the red buoy on Single Rock **WSW.**, one mile and an eighth distant. Between this buoy and Cedar Island Light-house is a dangerous part of the channel for large vessels, as there is a *thirteen feet spot lying almost exactly midway between Cedar Point and Nichol's Point*, which is not buoyed. This shoal bears **S. by E. $\frac{1}{4}$ E.** from the eastern end of Ram Island; **SE. by E. $\frac{1}{4}$ E.** from Nichol's Point; **NW. by N. $\frac{1}{4}$ N.** from Cedar Point; and **N. $\frac{3}{4}$ E.** from Cedar Island Light-house,—being distant from the latter about eight hundred yards. A good way to avoid it is to pass close to the black spar-buoy on the northwestern end of Cedar Point Shoal and steer for the red buoy on Single Rock, but the services of a pilot are needed here if you wish to pass safely and with certainty.

Nichol's Point Shoal makes off from Nichol's Point in an easterly direction for six hundred and fifty yards and has two feet upon it a short distance inside the buoy. The latter, *Nichol's Point Shoal*, which is painted red and marked No. 4, is placed in sixteen feet, and bears from the black spar-buoy on the northwestern end of Cedar Point Shoal **W. by N. $\frac{1}{2}$ N.** Northerly, about three-quarters of a mile, and from Outer Bar Buoy **W. $\frac{1}{4}$ S.**, nearly one mile and a half distant. From this buoy Cedar Island Light-house bears **S. by E. $\frac{1}{2}$ E.**, five-eighths of a mile, and Single Rock buoy **SSW.**, three-quarters of a mile distant.

The channel, which is about eight hundred yards wide between the lines of three fathoms, turns abruptly to the southward between Nichol's Point Shoal buoy and Cedar Island Light-house,—

Single Rock. the sailing-line passing midway between that light-house and Single Rock. This rock, which has three feet upon it, lies near the edge of the flats on the western side of the passage, exactly midway between Nichol's and Mashomuck points and about a quarter of a mile from shore. It is marked by a red spar (No. 6) placed in three fathoms on its eastern side and bearing from Nichol's Point Shoal buoy **SSW.**, distant three-quarters of a mile; from the black spar-buoy on the northwestern end of Cedar Point Shoal **WSW.**, one mile and an eighth; and from Cedar Island Light-house **W. $\frac{3}{4}$ S.**, nearly half a mile distant. When between this buoy and the light-house a black spar-buoy will be seen to the eastward of the course, bearing about **S. by E. $\frac{1}{2}$ E.**, and a little over half a mile off. This is on the edge of West Harbor Flats, which

West Harbor Flats. occupy the whole of West Harbor between Cedar Point and Russel's Neck with less than six feet at low water. The buoy is marked No. 5, placed in thirteen feet on the western edge of the flats and marks the eastern limits of the channel. It bears from Cedar Island Light-house **S. $\frac{3}{4}$ W.**, nearly twelve hundred yards, and from Single Rock buoy **SE. $\frac{1}{2}$ S.**, nearly fourteen hundred yards distant. Vessels must be careful not to bring this buoy in range with Cedar Island Light-house when to the southward of it, as the flats extend a long way from shore and are very abrupt. A good rule is not to go to the eastward of the light-house bearing **N. by E. $\frac{3}{4}$ E.** until you are up with the black buoy off Russel's Neck. This buoy, which is marked No. 7, is placed in sixteen feet on the *southwestern* end of the flats and between seven and eight hundred yards to the northward of Russel's Neck. It bears from the eastern end of Mashomuck Point **S. $\frac{1}{4}$ E.**, distant half a mile, and from Cedar Island Light-house **S. by W. $\frac{3}{4}$ W.**, distant nearly one mile and three-eighths.

Mashomuck Point is comparatively bold-to and may be approached within three hundred yards with not less than three fathoms. When abreast of the black buoy on the southwestern end of West Harbor Flats there will be seen ahead two red spar-buoys on the north side and two black spar-buoys on the south side of the channel, which here turns to the westward and is quite narrow,—being only about two hundred and fifty yards wide. The red spar-buoy first met with is marked *The Sand Spit*. No. 8 and placed in sixteen feet on the *southeastern* end of The Sand Spit, a great sand shoal occupying the middle of Shelter Island Sound between Hog Neck and Mashomuck Point, and extending **NW. by N.** and **SE. by S.** for more than one mile and a half. It is dry in some places at low water, but for most of its length has a depth of from four to ten feet upon it. An iron spindle surmounted by a keg stands upon the dry part of the shoal, about a quarter of a mile from its southern end, and bears from Mashomuck Point **SW. $\frac{1}{4}$ W.**, distant nearly three-quarters of a mile, and from the black spar-buoy on the northwestern part of West Harbor Flats **SW. by W. $\frac{1}{4}$ W.**, distant one mile and a quarter. The stone beacon and wooden tower which formerly stood upon this shoal were destroyed during the winter of 1874.

On the south side of the channel, directly opposite to the red spar-buoy (No. 8) and about three hundred yards from it, is a black spar buoy (No. 9); and four hundred yards to the westward of this is another black spar (No. 11). Both of these are on the northern side of Barcelona Bank Shoal, which makes off from Barcelona Bank (the northwestern extremity of *Barcelona Bank Russel's Neck*) in a westerly direction for three-quarters of a mile with a depth of *Barcelona Bank Shoal* from three to seven feet upon it. Opposite to the westernmost buoy and three hundred yards from it, on the north side of the passage, is a red spar-buoy (No. 10), which is on the southern end of The Sand Spit and nearly a quarter of a mile to the westward of the red buoy on the southeastern end of the Spit. Between these two red buoys on the north and the two black buoys on Barcelona Bank Shoal on the south runs the channel, with a depth of not less than three fathoms and a width of about three hundred yards.

When abreast of the red buoy on the southern end of The Sand Spit a small, low, bare islet will be seen to the southward of the course, bearing about *W. by S. $\frac{1}{2}$ S.* and distant half a mile. To the southward of this will be seen the town of Sag Harbor, but you cannot make a direct course for it on account of the long reef which connects this islet with the shore and which is bare at low water for a distance of three hundred and fifty yards inshore of the islet. This reef has in no place more than six feet upon it, and many sunken rocks with from one to three feet at low water lie scattered over it; and there is consequently no passage between the island and the Sag Harbor shore. At present the rule is to give the islet a berth to the southward of not less than three hundred yards; but there should be a black spar-buoy placed near the two feet rock about one hundred yards to the northward of the islet, and such action will be recommended, as this is the turning point in the channel leading to Sag Harbor.

When abreast of the islet a red spar-buoy will be seen bearing about *SW. by W. $\frac{1}{2}$ W.* and six hundred and fifty yards off. This is on the eastern end of Hog Neck Shoal, is marked No. 12, and placed in twelve feet at low water. Two hundred and fifty yards to the southwestward of it is another red spar (No. 14), placed on the southern end of the same shoal in ten feet water. The sailing-line leads close by both buoys and then towards the long wharf in Sag Harbor, carrying not less than twelve feet at low water. The proper position for No. 12 buoy would seem to be about a quarter of a mile to the northeastward of its present position and the same distance to the northwestward of the small islet above mentioned. If such change were made and a buoy placed on the northern end of the shoal making off from that islet the channel into Sag Harbor would be sufficiently well marked. The position proposed for the red buoy No. 12 is near a nine feet spot on the northeastern end of Hog Neck Shoal, six hundred and fifty yards to the eastward of the Hog Neck shore and half a mile nearly due *W.* from the spindle on The Sand Spit. Thus both sides of the channel would be well marked and the passage west of The Sand Spit, leading into Shelter Island Sound, might be utilized even for strangers. At present this passage, though good for nineteen feet at low water, cannot be used except by vessels which have local pilots on board, as the western side of The Sand Spit (which is the most dangerous) is not buoyed. Strangers must therefore pass *Hog Neck Shoal* to the eastward of The Sand Spit, between it and Mashomuck Point, carrying only sixteen feet at low water. Passing through this channel into Shelter Island Sound no dangers are met with, after passing The Sand Spit, except a fourteen feet shoal about three-eighths of a mile to the southward of the northern end of Hog Neck and three hundred yards from shore, and a twelve feet rock two hundred yards northeast of the northern end of the neck,—neither of which is buoyed. They are easily avoided by giving the neck a berth of a quarter of a mile to the westward to avoid the former, and its northeast point a berth to the westward and southward of three hundred yards to avoid the latter.

On rounding Hog Neck, if bound through Shelter Island Sound, the course turns abruptly to the westward and both shores are comparatively bold-to until you approach the northwestern end of Hog Neck, where the Hog Neck Flats make out to the westward for nearly five-eighths of a mile with less than fifteen feet water and are not buoyed. This part of the channel *Hog Neck Flats* requires careful navigation, even with an experienced pilot, although it is in no place less than two hundred and fifty yards wide with a depth of not less than twenty-three feet at low water.

When abreast of the northwestern end of Hog Neck there will be seen a little to the northward of the course, bearing about *W. $\frac{3}{4}$ S.* and distant nearly one mile, a red spar-buoy. This buoy is on the southern end of West Neck Shoal, is marked No. 2, and placed in twelve feet water about five-eighths of a mile to the southward of West Neck Point to mark the northern side of the channel. This buoy bears from Hallock's Point *SW. $\frac{1}{2}$ S.*, nearly one mile and five-eighths; from the northern extremity of Jessup's Neck *NE. by E. $\frac{3}{4}$ E.*, one mile and an eighth; and from the northwestern end of Hog Neck *W. $\frac{1}{2}$ N.*, nearly one mile distant. This buoy should either be moved to the westward about twelve hundred yards so as to mark the southwestern extremity of the shoal, or another red spar-buoy should be placed in the new position to mark the northeastern limits of the channel. Such change will be recommended.

From the red spar-buoy on the southern end of West Neck Shoal the black spar on Jessup's Neck Shoal bears *W. by S. $\frac{3}{4}$ S.*, distant nearly one mile and an eighth. Beyond this the dangers in Little and Great Peconic bays are the same as those described on pages 542-543.

West Neck Shoal.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING GARDINER'S BAY.

II. From the Eastward, bound to Sag Harbor and thence to the Peconic Bays.—When off Gardiner's Point, (see page 544,) with the light-house bearing **SE. $\frac{3}{4}$ E.**, distant about one mile, you will have seven fathoms, with Cedar Island Light-house bearing **SW. $\frac{1}{4}$ S.**, distant nearly seven miles and three-quarters. From this position the course is **SW. $\frac{1}{2}$ S.** for Outer Bar Buoy, passing to the southward of it close-to and steering **W. by S. $\frac{1}{4}$ S.** until you come exactly between Cedar Island Light-house and the red buoy on Nichol's Point Shoal,—having the former bearing **S. by E. $\frac{1}{2}$ E.**, a quarter of a mile distant. Round the light-house at nearly this distance (passing about midway between it and the red buoy on Single Rock) and steer **S. $\frac{3}{4}$ W.**, carrying not less than twenty-three feet, with the black buoy on the southwestern end of West Harbor Flats a little to the eastward of the course. Now, *if bound to Sag Harbor*, pass about one hundred and fifty yards to the westward of this buoy and steer to the westward, leaving the red buoys on the southern end of The Sand Spit and the black buoys on the northern side of Barcelona Bank Shoal at equal distances to the northward and southward. When abreast of the red buoy (No. 10) on the southern end of The Sand Spit steer **W. $\frac{1}{4}$ N.** for about eight hundred and fifty yards, until you come abreast of the small sand islet off Sag Harbor. Round this islet at a distance of three hundred and fifty yards, pass close to the red buoy (No. 12) on the eastern end of Hog Neck Shoal, and then steer for the long wharf in Sag Harbor.

The above courses pass nearly seven hundred yards to the northward of the striped buoy on Dangerous Rock; six hundred yards to the southward of the southeastern end of Ram Island Flats; a quarter of a mile to the northward of the black buoy on the northeastern end of Cedar Point Shoal; two hundred yards to the northward of the black buoy on the northwestern end of the same shoal; seven hundred and fifty yards to the southward of the red buoy on Nichol's Point Shoal; four hundred and fifty yards to the westward of Cedar Island Light-house; a quarter of a mile to the eastward of the red buoy on Single Rock; the same distance to the westward of the black spar-buoy (No. 5) on the western edge of West Harbor Flats; the same distance to the eastward of Mashomuck Point; one hundred yards to the westward of the black spar-buoy (No. 7) on the southwestern end of West Harbor Flats; about one hundred and fifty yards to the southward of the red spar-buoy (No. 8) on the southeastern end of The Sand Spit; the same distance to the northward of the black spar-buoy (No. 9) on the northern side of Barcelona Bank Shoal; the same distance to the southward of the red spar-buoy (No. 10) on the southern end of The Sand Spit; the same distance to the northward of the black spar-buoy (No. 11) on the northern side of Barcelona Bank Shoal; three hundred and fifty yards to the northward and four hundred yards to the westward of the small islet off Sag Harbor; fifty yards to the eastward of the red spar-buoy (No. 12) on the eastern end of Hog Neck Shoal; and the same distance to the eastward of the red spar-buoy (No. 14) on the southern end of that shoal.

But, if intending to pass through Shelter Island Sound and thence into the Peconic Bays.—When, on the **S. $\frac{3}{4}$ W.** course from between Cedar Island Light-house and the red buoy on Single Rock, the light-house is brought to bear **NE. by N. $\frac{1}{2}$ N.**, steer **SW. by S. $\frac{1}{2}$ S.** for half a mile, carrying not less than four fathoms, until the eastern end of Mashomuck Point bears **N. Westerly**, a quarter of a mile, and the spindle on The Sand Spit **W. by S. $\frac{1}{2}$ S.**, twelve hundred yards distant. Now steer **W. $\frac{1}{2}$ N.** for a little over half a mile, or until the spindle on The Sand Spit bears **S. by W. $\frac{1}{2}$ W.**, distant a quarter of a mile, and the northeastern extremity of Hog Neck **NW.**, distant more than a mile and three-quarters. Here you will have nineteen feet and **NW. $\frac{1}{2}$ N.** will lead, with not less than nineteen feet, past the northern end of Hog Neck. On this course, when the northeastern end of the neck bears **SW. by S. $\frac{1}{4}$ S.**, distant four hundred yards, you must steer **W. by S. $\frac{1}{4}$ S.**, carrying not less than four fathoms, until you come abreast of the red buoy on the southern end of West Neck Shoal. When past this buoy continue the course to the westward until Hallock's Point bears **NNW.** and the northern extremity of Jessup's Neck **SW. by W. $\frac{3}{4}$ W.**, about three-quarters of a mile distant. when steer **W. $\frac{3}{4}$ S.** for about five-eighths of a mile, until past the black spar-buoy off Jessup's Neck and the southern end of Little Hog Neck bears **SW. $\frac{1}{4}$ W.** Now steer **SW. by S.** and follow the directions given on page 544 for the Peconic Bays.



Brown Hills

Howe

Cypress Point Pt.

Spauld

Plum Island Pt. Plum Island

Approaches to Plum Gut from the Eastward, Plum Island Lt. Ho. bearing NW by N. 4 N. distant 2 Miles.



Plum Island

Plum Lt. Ho.

Howe Pt.

Spauld

Becker's Id.

Cypress Point Pt.

Howe

Approaches to Plum Gut from the Westward, Plum Island Lt. Ho. bearing E by S. 4 S. distant 2 Miles.

DANGERS

IN APPROACHING AND ENTERING GARDINER'S BAY.

III. *From the Westward, through Plum Gut.*—Plum Gut, as before mentioned on page 534, is the passage between Plum Island and Oyster Pond Point,—the latter being the northeastern extremity of Long Island. It is one mile and an eighth wide, but the available channel is diminished to a width of twelve hundred yards between the lines of three fathoms by a dangerous shoal known as Oyster Pond Reef, which makes off from Oyster Pond Point in an E. by N. $\frac{1}{4}$ N. direction for twelve hundred yards and has less than four feet upon it at mean low water at a distance of eight hundred yards from shore. A spindle surmounting a circular granite structure is placed near the eastern edge of the reef in three feet water, about seven hundred and fifty yards from Oyster Pond Point; and vessels of more than eighteen feet draught must give it a berth to the westward of not less than four hundred and fifty yards.

Oyster Pond Reef.

The most dangerous obstruction in the gut, however, is off the northwest point of Plum Island, near the light-house, where a reef makes off to the westward for about one hundred and fifty yards; and a dangerous eight feet rock, called Beebe Rock, lies about seventy-five yards SW. by W. from the point. This reef, which has from six to ten feet water upon it, projecting across the tides in Long Island Sound and the gut, (which come from opposite directions,) forms a very dangerous rip or overfall, which cannot be crossed with safety except by powerful steamers or by sailing vessels with a very strong fair wind. It is best, therefore, to give Northwest Point a berth of about three-eighths of a mile to the eastward, passing about midway between it and the spindle on Oyster Pond Reef.

Beebe Rock.

Nearly two hundred yards SW. from Beebe Rock is the *Northwest Middle*, which has four fathoms and is not dangerous except to vessels of the largest class; and nearly three hundred yards S. by E. from this is the shoal of *The Middle Ground* with nineteen feet at mean low water. The Middle Ground is an extensive shoal lying in a N. by W. and S. by E. direction, and is composed of three distinct shoals, each about sixty yards in diameter, and separated from each other by narrow passages about thirty-five yards wide. The northeastern end of the shoal has but nineteen feet and bears from Plum Island Light-house SW. $\frac{3}{4}$ S., distant nearly five hundred yards. The northwestern end has four and a half fathoms and the southern end four and a quarter fathoms. The only part of the shoal, therefore, which is dangerous is the northeastern end, where a red buoy should be placed as a guide to vessels drawing more than eighteen feet. Such action will be recommended.

The Middle Ground.

It is usual to pass to the westward of *The Middle Ground*,—the channel between it and Oyster Pond Reef being in no place less than a quarter of a mile wide with a depth of from five to thirty fathoms.

Midway Shoal is a detached shoal with from seventeen to eighteen feet upon it, lying at the southern end of the gut, about seven hundred yards due S. from *The Middle Ground* and five-eighths of a mile W. $\frac{1}{2}$ S. from Pine Point. It is easily avoided, although not buoyed, as the strong current, which has a velocity of from two to four miles an hour, sets past the shoal in the direction of the deep channel.

Midway Shoal.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING GARDINER'S BAY.

III. *From the Westward, through Plum Gut.*—On the E. course through the Main Channel of Long Island Sound, when Plum Island Light-house bears SE. $\frac{1}{2}$ S., distant a little over two miles and an eighth, Little Gull Island Light-house E. $\frac{3}{4}$ S., a little over six miles and a quarter, and Oyster Pond Reef spindle S. by E. $\frac{3}{4}$ E., distant two miles and three-eighths, you will have twenty-seven fathoms, and must steer for Plum Island Light-house until within seven-eighths of a mile of it and Little Gull Island Light-house bears E. $\frac{1}{2}$ N. and is in range with the northern end of Great Gull Island. Now steer SSE., carrying not less than eight fathoms, passing to the westward of *The Middle Ground* and to the eastward of *Midway Shoal*, and when Plum Island Light-house bears N. $\frac{3}{4}$ W., distant one mile, Gardiner's Island Light-house SE. by E. $\frac{3}{4}$ E., distant two miles and three-quarters, and Pine Point NE., distant a little over half a mile, steer SW. if bound to *Greenport*, which will bring you up with the perpendicularly-striped buoy at the entrance; or, if bound to *Sag Harbor*, steer SSW., which will lead with not less than four and a half fathoms to the Outer Bar Buoy; after which you must follow the directions for the harbors given on pages 544 and 548.

The above courses pass nearly four hundred yards to the westward of *Beebe Rock*; two hundred yards to the westward of the shoal of *The Middle Ground*; eight hundred yards to the eastward of

the eastern end of Oyster Pond Reef; half a mile to the eastward of Oyster Pond Reef spindle; and about one hundred and seventy-five yards to the eastward of Midway Shoal.

The current runs with such velocity in Plum Gut that it is not advisable for strangers to attempt to pass through unless with a strong fair wind.

LIGHT-HOUSES.

NAME.	Latitude.			Longitude West.			Fixed or Revolving.	Interval of Flash.	Height above sea-level.	Distance visible in nautical miles.	
				In arc.		In time.					
	°	'	"	°	"	h. m. s.					m. s.	Feet.
Plum Island Light-house	41	10	23	72	12	43	4 48 51	Revolving.	0 30	76	14
Gardiner's Island Light-house	41	8	29	72	8	44	4 48 35	Fixed.	-----	33	11
Long Beach Point Light-house	41	6	31	72	18	23	4 49 14	Fixed red.	-----	54	13
Cedar Island Light-house	41	2	25	72	15	41	4 49 3	Fixed.	-----	45	11

TIDES.

Corrected Establishment at Plum Gut 10^h 12^m
 Mean Rise and Fall of tides 2.6 ft.

VARIATION OF THE COMPASS.

The magnetic variation for 1880 in Gardiner's Bay is 9° 25' W., with an approximate annual increase of 2½'.

SOUTH COAST OF LONG ISLAND.

The south coast of Long Island has a general course about W. by S. ½ S. for sixty-eight miles from Montauk Point to Fire Island Inlet; and thence about W. ½ N. for a little over thirty-five miles to the southwestern end of the island (at Gravesend Bay) and the northern point of entrance to the Lower Bay of New York. It is a clean shore,—being safely approachable within three-quarters of a mile with not less than five fathoms anywhere between Montauk Point and Rockaway Inlet,—and when viewed from seaward presents but few characteristic features. This south coast is composed of a series of sand hillocks backed by low dark woods; and the only break in the monotony of the outline is made by the inlets and the small villages near the beach.

Montauk Point, the eastern extremity of the island, will appear, when seen from seaward, as a high sandy bluff with perpendicular faces and somewhat undulating surface covered only with grass. Perched upon the top of the bluff and close to its edge stands the light-house, with the keeper's dwelling and the hut containing the fog-signal at its base. To the northward

the country gradually descends, while along the coast to the southwestward the shore-line is broken up by several small coves which cut the line of cliffs so as to present an appearance of low grassy lands alternated with high, perpendicular, sandy bluffs. Montauk Point Light-house is a white stone tower ninety-two and a half feet high, and shows a fixed white light (varied every two minutes by flashes) from a height of one hundred and sixty-nine and a half feet above the sea, visible twenty miles. The light is of the first order of Fresnel and the flashes are visible from three to four miles farther than the fixed light, so that when first made it will appear as a revolving white light. The keeper's dwelling, which is painted brown, stands on a hill adjacent to the light-house. The geographical position of this light-house is

Latitude 41° 4' 13" N.
 Longitude 71° 51' 27" W.,

and it bears from

Davis' South Shoal Light-vessel, W. by N. ½ N.	91 ½	Miles.
Gay Head Light-house, W. by S. Southerly	49 ½	
Block Island Southeast Light-house, W. by S. Southerly	14 ½	
Block Island North Light-house, SW. by W. ½ W.	15 ½	
Point Judith Light-house, SW. ½ W.	24 ½	
Watch Hill Light-house, S. ½ W.	14	

The fog-signal is a Daboll air-trumpet of the first order, giving blasts of twelve seconds' duration at intervals of fifty seconds during foggy weather.

About fourteen miles to the westward of Montauk Point and half a mile back from the beach will be seen the settlement of Amagansett, and one mile and three-quarters to the westward of this the village of East Hampton. A little over three miles to the westward of the latter is Wainscott, and one mile and three-quarters to the westward of this Sagg Village. All of this part of the island is under cultivation, and so continues as far as South Hampton, twenty-seven miles to the westward of Montauk and one mile and a half to the eastward of Shinnecock Bay.

Thirty-three miles to the westward of Montauk is Shinnecock Inlet, about an eighth of a mile wide, which leads into the large but shallow bay about eight miles long, known as Shinnecock Bay. It cannot be entered by strangers,—being closed by



Montauk Point from the Eastward, the Lt. Ho. bearing W. by N. & N. distant 5 Miles.



Montauk Point from the Westward, the Lt. Ho. bearing N. E. by N. & N. distant 2 Miles.

a shifting sand bar with less than six feet at low water. Yet this part of the coast is well known to navigators, from the **Shinnecock Hills**, about two miles and a half back from the beach, and from the light-house on the north side of the bay known as **Shinnecock Light-house**. This light-house is on **Ponquogue Point**, about midway **Shinnecock Light-house** between the eastern and western ends of the bay and one mile to the eastward of the inlet, and is looked for by all vessels approaching the coast from the southward or eastward. The tower is not often visible; but at night the light is seen, under favorable circumstances, at a distance of nineteen miles. The light-house is a red brick tower with grey dwelling attached, and shows a fixed white light, of the first order, from a height of one hundred and sixty feet above the sea. Its geographical position is

Latitude 40° 51' 1" N.
 Longitude 72° 30' 16" W.

It is thirty-two and a quarter miles to the westward of Montauk Point Light-house and thirty-five miles to the eastward of Fire Island Light-house. The bay, though broad, is shallow, and no description of it would be of use to navigators.

From Shinnecock Inlet to Fire Island Inlet, a little over thirty-four miles to the westward, the coast presents an unbroken line, composed of innumerable sand hillocks backed by woods. This appearance is caused by a narrow strip of sand from two hundred to eight hundred yards in width, which separates from the ocean the large but **Moriche's Bay**. shallow bays known as **Moriche's Bay** and **Great South Bay**. The former, which is the easternmost and smallest, begins about two miles to the westward of Shinnecock Bay and extends nearly twelve miles to the westward to **Smith's Point**,—the eastern point of entrance to **Great South Bay**. The villages of **Quogue**, **Petunk**, **Speonk**, **Seatuck**, and **Moriches** are situated on its northern shores amidst cultivated fields backed by thick woods.

Nearly twenty-three miles to the westward of Shinnecock Inlet is the easternmost of the high sand hillocks which mark the approach to **Fire Island Inlet**, known as **Watch Hill**. It is easily recognizable as being the first hill of any prominence met with to the westward of Shinnecock; and hence to the westward the shore shows a series of sand hills of various heights and steep faces to the southward as far as **Fire Island Inlet**. Prominent among these are the **Head and Horns**, four miles to the westward of **Watch Hill**; and **Ruland's Hills**, which stretch in a line about one mile long between two and three miles to the westward of the **Head and Horns** and about six miles to the westward of **Watch Hill**.

FIRE ISLAND INLET.

Fire Island Inlet is easily recognized by the line of large white hotels on the beach and the tall yellow light-tower on the eastern side of the inlet. It is the principal entrance to **Great South Bay**, and is about eight hundred yards wide between **East Point** (the western end of **Fire Island Beach**) and **West Beach Point**, (the southeastern end of **Oak Island**.) Eighteen feet at low water may be taken across the bar through a very narrow channel; but as this channel is not available except for steamers with a fair tide, the bar is so buoyed that not more than sixteen feet can be taken over it through a channel about two hundred and fifty yards wide. The bar is apt to shift in easterly gales, and the buoys are changed accordingly. Strangers should, therefore, not attempt to pass beyond the **Outer Bar Buoy** without a pilot except in case of urgent necessity. A pilot may always be obtained by making the usual signal.

East Point, the eastern point of entrance to the inlet, is a mere flat sand spit, but little elevated above high-water mark, and subject to change after every heavy gale. One mile and a half to the eastward of it is built the light-house, known as **Fire Island Light-house**,—a very important sea-coast light. It is a brick tower one hundred and fifty-two feet high, painted yellow, and attached to the keeper's dwelling, which is of dark grey stone with hipped roof. It shows a revolving white light, of the first order, from a height of one hundred and sixty-eight feet above the sea, visible twenty miles. The light revolves once a minute. Its geographical position is

Latitude 40° 37' 55" N.
 Longitude 73° 13' 9" W.,

and it is about sixty-seven miles to the westward of **Montauk Point Light-house**; thirty-five miles to the westward of **Shinnecock Light-house**; thirty-one miles to the eastward of **Sandy Hook Light-vessel**; thirty-seven miles and three-quarters to the eastward of **Navesink Light-houses**; and thirty-seven miles to the eastward of **Sandy Hook Light-house**. (See view.)

Oak Island, which forms the western side of the entrance to the inlet, is of very irregular shape, about three miles long, and composed almost entirely of marsh faced on its southern side by a strip of sand covered with low hillocks. On its eastern side is a narrow and shallow inlet known as **Whig Inlet**; and about six hundred yards to the eastward of this is a flat sandy islet, lying about **W NW.** and **ESE.**, fourteen hundred yards long, and known as **Saxton's Island**. There is no passage between the two. **Oak Island.**

Nearly one mile to the eastward of **Saxton's Island** lie the **Fire Islands**, a group of three islets lying in a line nearly **W.** by **N.** and **E.** by **S.** and composed entirely of marsh. They are surrounded by shoal water, which extends to the northward from them for nearly seven-eighths of a mile with less than six feet, and to the eastward for one mile and five-eighths with the same depth; but on their southern and western sides the deep-water channel runs close to,—five fathoms being found within an eighth of a mile of the western islet,—and a narrow and crooked channel winding along their southern side, with a depth of from three to four fathoms at distances varying from two hundred to six hundred yards. **Fire Islands.**

Great South Bay, which extends from **Smith's Point** (the western extremity of **Moriche's Bay**) to **Line Island**, (in **South Oyster Bay**,) is twenty-eight miles long and of very irregular shape,—its width varying from half a mile to three miles and a half. Although so large and wide it is shallow,—being good for but eight feet at low water. It forms a natural harbor for the light-draught fishing-boats of the island, and a very considerable trade is carried on throughout the year in oysters and fish. The northern shore of the bay is well settled,—the villages of **Bellport**, **Patchogue**, **Blue Point**, **Islip**, **Mechanicville**, **Babylon**, **South Huntington** and **South Oyster Bay** being situated pretty close to the shore-line. It is scarcely necessary to say that navigation of the bay is impossible without the assistance of a local pilot.

At the eastern extremity of Great South Bay is **Bellport Bay**, on the northern shore, into which empties a small narrow stream called the **Connecticut River**. The bay itself is three miles wide mouth, between **Smith's Point** and **Howell's Point**, but has not more than four feet at low water. On the western side of **Howell's Point** makes in **Patchogue Bay**, good for but three feet at low water, and receiving the waters of **Patchogue Creek**, which leads up to the village of that name. Its western point of entrance, called **Blue Point**, is four miles to the westward of **Howell's Point** and is the eastern extremity of the village of the same name.

Three miles and a half to the westward of **Blue Point** and eight miles to the northeastward of **Fire Island Inlet** is **Green's Point**, the eastern point of entrance to **Connetquot Cove**, a shallow cove with from six to nine feet water, which receives the waters of **Connetquot Brook**, a shallow creek with three feet in it at low water. The western point of entrance to the cove is **Nicoll's Point**, and is composed entirely of marsh. To the westward of this is **Champlin's Creek**, **Great Cove**, **Thurber's Creek**, **Sampawam's Creek** and many other small estuaries of which no intelligible description can be given.

GENERAL DIRECTIONS

FOR APPROACHING AND ENTERING FIRE ISLAND INLET.

Fire Island Inlet is the only harbor of refuge on the southern coast of **Long Island**. A "Whistling Buoy" has been placed off the entrance, six miles from the light-house and thirty-seven and a half miles from **Sandy Hook Light-vessel**. This buoy is intended as a guide during thick weather to vessels bound to **New York**,—being nearly on the sailing-line for vessels which have come outside of **Nantucket Shoals**. If you make it and are bound into the inlet you must steer about **NW.** by **N.** $\frac{1}{2}$ **N.** for about five miles, which will bring you up with the "Outer Bar Buoy,"—a nun* of the first class, painted white and black in perpendicular stripes. This buoy is placed in seven fathoms outside of any broken water even in the heaviest weather. When up with it a **N.** course will lead towards the "Inner Bar Buoy," which is a nun of the second class, also painted white and black in perpendicular stripes. From this buoy you must steer about **N.** by **W.** $\frac{1}{4}$ **W.** (1880) for a spar-buoy, also painted white and black in perpendicular stripes; and when up with it **N.** by **W.** $\frac{1}{2}$ **W.** for a second and similarly painted spar-buoy. When up with this buoy, which you may pass on either hand with not less than nineteen feet, you may steer **NE.** by **E.** for a red spar-buoy (No. 2). Thence steer **E.** by **S.** $\frac{1}{4}$ **S.** for a black spar-buoy (No. 1), from which the course to the anchorage off the hotel wharf is nearly due **E.**; but navigators are cautioned that, inasmuch as the channel over the bar is apt to shift with every severe easterly gale, too much dependence must not be placed upon the above courses. In ordinary weather, however, the buoys can be seen from each other, and, as they are shifted with the changes in the bar, it will be ordinarily safe to run for them if you cannot get a pilot. It is always best, however, to take a pilot if one can be had.

ROCKAWAY INLET.

From **Fire Island Inlet** to **Rockaway Inlet** the distance is twenty-eight and a half miles and the direction a little to the northward of **W.** The coast line is pierced by several shallow inlets, of which **Gilgo Inlet**, eight miles to the westward of **Fire Island Inlet**; **New Inlet**, six miles to the westward of **Gilgo**; and **Hog Island Inlet**, five miles and three quarters to the westward of **New Inlet**, are the principal. They are all very shallow and none of them can be entered even by the smallest vessels without a pilot.

Rockaway Inlet makes into what is known as **Jamaica Bay**, between **Rockaway Beach** on the east and **Duck Bar** and **Barren Island** on the west and north. A bar with fifteen feet must be crossed to enter the inlet; and this bar is of shifting sand,—a fact which renders it necessary for navigators to avail themselves of the services of a local pilot. When over the bar there is deep water—not less than sixteen feet—until the inlet is fairly entered, after which the depth varies from four to ten fathoms throughout an almost unobstructed channel from one hundred and seventy-five yards to three-eighths of a mile in width. The shore on both sides is subject to change, and its shape and extent as delineated upon the charts must not be implicitly relied upon.

FIRE ISLAND INLET

Scale Below

1880



NOTE
 The Soundings given in this chart are taken from the original observations of the U.S. Coast and Geodetic Survey. They are not corrected for the effects of the Earth's curvature.

SOUNDINGS

Soundings in fathoms to mean low water
 Depths less than 3 fathoms in feet on a shaded surface

BUOYS

- Red buoy to be left in entering on Starboard hand
- Black buoy to be left in entering on Port hand
- Black and red horizontal stripes - Danger buoy
- Black and white perpendicular stripes - Channel buoy





018 Island
Beach

View of Fire Island Inlet, Fire Island Lighthouse, North, distance 3 Miles.

Rockaway Beach, the western end of which forms the eastern point of entrance to the inlet, is composed of a great number of sand hillocks faced by beach and backed by marsh. About nine hundred yards to the southward of the western end of the beach is a dry sand spit three-eighths of a mile long in a **NNE.** and **SSW.** direction, **Rockaway Beach**, marking the eastern side of the entrance; and three-eighths of a mile to the westward of the same point is another dry sand spit between seven and eight hundred yards long, marking the western side.

Barren Island, on the northern side of the inlet, is composed of alternate marsh and sand, is of irregular shape, one mile and three-eighths long **E.** and **W.** and five eighths of a mile wide at its widest point. It is bold-to on its southern and eastern sides,—four fathoms being found within one hundred yards of the former and five fathoms within thirty yards of the latter. A number of large hotels and their outbuildings are situated on the southern and eastern sides of the island and there are a number of smaller buildings scattered over the firm ground. **Barren Island.**

Jamaica Bay, into which the inlet leads, is a large but shallow bay five miles and a quarter long with a greatest width of three and a half miles, but so full of marsh islets and islands as to render its navigation utterly impossible except to very light-draught vessels with local pilots on board. These islets are very numerous and no intelligible description can be given of them. Beginning with the southernmost, on the eastern side, they are known as **Ruffle Bar**, **Jamaica Bay**, **Big Fishkill Hassock**, **Joel's Point Hassock**, **Old Swale Marsh**, the **Fishkill Hassocks**, **Nestepoll Marsh**, **Christianpoll Marsh**, **Duck Point Marshes** and **Pumpkin Patch**,—all marking the limits of what is known as the **Fishkill** or **Eastern Channel** into the bay. The **Main Channel** leads between **Nova Scotia Bar** on the east and **Barren Island** on the west, and thence between **Old Swale Marsh** and **John's Point Marsh**, and is good for not less than nine feet water to abreast of the northern end of **Duck Point Marshes**. But so many are the islands and so intricate the channels and slues among them that it would be worse than useless to attempt to give any intelligible description of them.

Of the numerous channels leading among the shoals and islets of **Jamaica Bay** no intelligible description can be given. **Big Fishkill Channel**, **Duck Point Channel**, **Big Channel**, **Island Channel** and **Deep Creek** or **Irish Channel** are all navigable, but require the assistance of a local pilot. None but steamers enter the inlet at present whose masters are fully acquainted with the dangers.

The current of flood and ebb in the inlet sets nearly in the direction of the axis of the channel,—the former having a velocity of a little over one mile and the latter a little over two miles per hour.

To the westward of **Barren Island**, at a distance of three-eighths of a mile, begins **Pelican Island**, with **Dead-horse Inlet** between them. This inlet, through which but four feet at low water can be taken through a channel so narrow as to be available only for steamboats, leads into **Deep Creek** or **Irish Channel**, above mentioned, and is very seldom used. No description of it would be of any use to strangers.

The only place of any importance on **Jamaica Bay** is **Canarsie Landing**, about two miles and three-quarters to the northward of **Barren Island**. Five feet at low water can be taken up to this landing by passing through **Big Channel**, but the passage is only fit for steamboats with local pilots on board.

Pelican Island is composed of marsh, faced with a sand beach on its southern side, to which the name of **Pelican Beach** has been given. The island is one mile long, and just to the westward of it begins **Coney Island**, which extends in a **W.** by **N.** direction for three miles and a half,—its western end forming the northern point of entrance to **New York Bay**. The south shore of the island is dotted with houses,—prominent among which are the large summer hotels on **Manhattan Beach**. **Pelican Island.**

Directions for coasting the south shore of **Long Island** will be found under "Sailing Directions" for approaching **New York Harbor** from the eastward.

GENERAL DIRECTIONS

FOR APPROACHING AND ENTERING ROCKAWAY INLET.

In approaching **Rockaway Inlet** from the eastward there will first be seen a red can-buoy* of the second class, placed to the eastward of the entrance in three and a half fathoms water. This is on **Rockaway Shoals** and also marks the site of the wreck of the steamship "Black Warrior." It is marked No. 2 and bears from **Sandy Hook Light-vessel NE.** by **E. $\frac{1}{2}$ E.**, distant about nine miles, and from the stone beacon on **The Romer E. $\frac{3}{4}$ N.**, distant eight miles and three-eighths. When up with it pass to the southward of it and continue the course, heading about midway between **Sandy Hook** and **The Romer** beacon until you come up with the bar buoy at the entrance,—a first-class can,* painted black and white in perpendicular stripes and placed in five fathoms just to the southward of the bar. When up with this buoy pass close to it and steer **N.** by **E. $\frac{1}{2}$ E.**, which will lead, with not less than fifteen and a half feet at low water, to a perpendicularly-striped spar-buoy nearly five-eighths of a mile to the northward, and placed in twenty-two feet water nearly in mid-channel. When up with this buoy a nun-buoy* painted black and white in perpendicular stripes will be seen about half a mile to the northward, and **N.** by **E. $\frac{1}{2}$ E.** will lead directly to it with not less than sixteen feet at low water. Pass on either side of it and steer **N.** by **E. $\frac{3}{4}$ E.** for five-eighths of a mile, carrying not less than

seventeen feet until just past the western end of Rockaway Beach,—having it bearing **SE.**, distant about three hundred yards, and the black stake on the southern end of *the shoals off Dead-horse Inlet N. by W.*, distant one hundred and seventy-five yards. Here you will have nine fathoms and **ENE.** will lead, with not less than three and a half fathoms, along the southern shore of Barren Island and up to the wharf-line in front of the large hotels.

NEW YORK BAY AND HARBOR.

New York Bay, which lies at the confluence of the Hudson and East rivers, is very irregular in shape,—being divided into an Upper and Lower or Inner and Outer bay by a passage one mile wide known as The Narrows. From the mouth of the Hudson (abreast of **The Battery** at New York) to the entrance to the Lower Bay the distance is twelve miles, with a depth in the channel of not less than four and a quarter fathoms. The great commercial cities of **New York** and **Brooklyn** lie at the head of the bay,—the former occupying **Manhattan Island** between the Hudson and East rivers, and the latter lying on the eastern bank of the East River.

The entrance to the bay is between Gravesend Point (the western extremity of Coney Island) on the north and Sandy Hook Point (the northern extremity of Sandy Hook) on the south, and is nearly six miles wide. The passage is, however, by no means clear or unobstructed,—many dangerous shoals making off from the Coney Island shore with narrow channels among them. The Main Channel runs close under the Sandy Hook shore.

On approaching the bay from the eastward the most prominent objects visible are two tall brown light-towers, connected with each other by a dwelling-house of the same color and perched upon a bare plateau of small extent upon a high thickly wooded eminence. These are the Navesink or Highland Light-houses, situated on the easternmost spur of **Navesink or Highland Light-houses.** the **Highlands of Navesink**, on the New Jersey coast, four miles and five-eighths to the southward of Sandy Hook Point and on the northern bank of the Navesink River. The Highlands are thickly wooded except in the vicinity of the light-houses, and in summer present a beautiful appearance. At the base of the hills towards the sea are clustered a great number of white houses. The Highland Light-houses are two towers of red sandstone, two hundred and twenty-eight feet apart **NW.** and **SE.** and fifty-three feet high. The northwestern tower is eight-sided and the southeastern square, and they show two fixed white lights, of the first order, from a height of two hundred and forty-eight feet above the sea, visible twenty-two miles. The geographical position of the northwestern light is

Latitude ----- 40° 23' 45" N.
Longitude ----- 73° 59' 11" W.

That of the southeastern light is

Latitude ----- 40° 23' 43" N.
Longitude ----- 73° 59' 10" W.

They bear from

	Miles.
Davis' South Shoal Light-vessel, W. $\frac{1}{4}$ N.	191
Fire Island Light-house, W. by S. $\frac{3}{4}$ S.	nearly 38
Whistling Buoy off Fire Island Inlet, W. $\frac{1}{4}$ S.	38
Sandy Hook Light-vessel, W SW.	6 $\frac{1}{2}$

There is no fog-signal.

Sandy Hook Light-vessel, which is the principal guide to the entrance to New York Bay, is moored in fourteen fathoms on the following bearings:

	Miles.
Navesink Light-houses, W SW.	6 $\frac{1}{2}$
Scotland Light-vessel, W. $\frac{1}{4}$ N.	3 $\frac{1}{2}$
Sandy Hook Light-house, W. by N. $\frac{1}{4}$ N.	6 $\frac{1}{2}$
Hook Beacon, (Sandy Hook Point,) W. by N. $\frac{1}{4}$ N.	6 $\frac{1}{2}$

This light-vessel bears from

	Miles.
Davis' South Shoal Light-vessel, W. Northerly	184 $\frac{1}{2}$
Fire Island Light-house, W. by S. Southerly	31
Whistling Buoy off Fire Island Inlet, W. Northerly	31 $\frac{1}{2}$
Barnegat Light-house, N NE.	43

The vessel is two masted, the hull painted red, with the words "*Sandy Hook*" in large white letters on each side and a black circular cage-work day mark at each masthead. It shows two fixed red lights from a height of forty-five feet above the sea, visible twelve miles; and its approximate geographical position is

Latitude ----- 40° 26' 53" N.
Longitude ----- 73° 53' 0" W.

During thick weather a bell is rung and a self-acting fog-horn sounded.

When up with Sandy Hook Light-vessel the "*Whistling Buoy*" at the entrance to the Main Channel bears **NW. $\frac{1}{4}$ N.**, distant three miles and five-eighths; the perpendicularly-striped buoy at the entrance to the South Channel **W. $\frac{1}{4}$ N.**, two miles and three-quarters; and Scotland Light-vessel **W. $\frac{1}{4}$ N.**, distant three miles and five-eighths.



Highland
Light

Approach to New York Harbor from the Eastward, Highland Light bearing W. by S. 1/2 S. distance 6 1/2 Miles.

North Rock
South Rock

North Rock
South Rock

North Rock
South Rock

Rock Point

Scotland Light-vessel is placed close to the site of the wreck of the steamship "Scotland," in seven fathoms water, and bears from Sandy Hook Light-vessel **W. $\frac{1}{2}$ N.**, distant three miles and five-eighths, and from the Highland Light-houses **NE. $\frac{3}{4}$ N.**, distant three miles and a half. She is two masted, with circular cage-work day-marks at each masthead, her hull lead color, and the words "*Wreck of Scotland, No. 20,*" painted in large black letters on each side. She shows two fixed white lights from a height of forty-five above the sea, visible twelve miles; and her geographical position is (approximately)

Scotland Light-vessel.

Latitude ----- 40° 26' 37" N.
 Longitude ----- 73° 56' 26" W.

A bell is rung during foggy weather.

When up with Scotland Light-vessel the black nun-buoy off the southern end of False Hook Shoal bears **W. by N. $\frac{1}{4}$ N.** Northerly, eight hundred and fifty yards; Sandy Hook Light-house **NW. by W. $\frac{1}{2}$ W.**, two miles and three-quarters; the Hook Beacon **NW. $\frac{3}{4}$ W.**, three miles and a quarter; and Elm Tree Beacon **NW. $\frac{3}{4}$ N.**, with New Dorp Beacon just open to the southward of it.

Gravesend Point, the northern point of entrance to New York Bay, is composed entirely of sand and has several hillocks upon it varying in height from twenty to forty feet. There are also several large houses on the beach and a number of wharves. This point cannot be approached closely from the southward on account of the dangerous shoals making off from it,—the principal among which is the **East Bank** with from three to five feet at low water. On its western side, however, it is quite bold-to and may be approached within two hundred and fifty yards with not less than five fathoms.

Gravesend Point.

Sandy Hook Point, the southern point of entrance to the bay, is the northern end of Sandy Hook, and is composed entirely of sand but little elevated above high water. On the western side of the point is placed an iron tower forty-two feet high and painted red, called the **Hook Beacon**, which shows a fixed white light, of the fourth order, from a height of forty-six feet above the sea, visible eleven miles. Its geographical position is (approximately)

Sandy Hook Point.

Latitude ----- 40° 28' 16" N.
 Longitude ----- 74° 0' 27" W.,

and it bears from Sandy Hook Light-vessel **W. by N. $\frac{3}{4}$ N.**, distant six miles and five-eighths, and from Scotland Light-vessel **NW. $\frac{3}{4}$ W.**, distant three miles and a quarter. From this beacon Elm Tree Beacon (on Staten Island) bears **NW. by N. $\frac{1}{4}$ N.** Nearly, distant six miles and three-quarters, and the beacon on The Romer **N.**, distant nearly two miles and a half. Close to the beacon and to the northward of it is seen the hut containing the **fog-signal**, which is a first-order steam fog-siren, (in duplicate,) giving blasts six seconds long at intervals of forty seconds. Just to the southward of the beacon will appear a large granite fortification in an unfinished condition; and near it, on its southern side, a number of low houses.

Sandy Hook is a long, low, sandy peninsula on the Jersey coast, to which it is joined by a low beach about three miles and a half long and in no place more than three hundred yards wide. This beach may be said to begin near the village of **Sea-bright**, about two miles and a quarter to the southward of the Highland Light-houses, and is but little elevated above high water. When seen from the eastward it seems to be part of the mainland skirting the base of the Highlands; but in reality it is separated from the mainland by the **Navesink** and **Shrewsbury** rivers. Sandy Hook when seen from the eastward will appear low and somewhat undulating in outline, with a thick growth of low scrubby trees on the middle and highest part. Its width varies from four hundred and fifty yards, at its southern end, to seven-eighths of a mile about midway of its length and about one mile and a half below the Hook Beacon. About three-quarters of a mile below its northern end, on a hillock about fifteen feet high and surrounded by low trees, stands **Sandy Hook Light-house**, a white tower, seventy-seven feet high, with dwelling-house attached. It shows a fixed white light, of the third order, from a height of ninety feet above the sea, visible fifteen miles; and is in

Sandy Hook and Light-house.

Latitude ----- 40° 27' 40" N.
 Longitude ----- 74° 0' 9" W.

About a quarter of a mile to the northwestward of it there will appear a low white tower, called the **West Beacon**, situated on the western shore of the Hook, about half a mile to the southward of the Hook Beacon. It shows a fixed white light, of the sixth order, from a height of forty-five feet, visible eleven miles; but this light will not be seen by vessels coming from seaward until it bears **SW.**, owing to a screen which is placed in front of it, about three hundred yards to the eastward of it.

Sandy Hook Light-house bears from

	Miles.
Davis' South Shoal Light-vessel, W. $\frac{1}{2}$ N. -----	190
Fire Island Light-house, W. $\frac{1}{2}$ S. -----	37
Whistling Buoy off Fire Island Inlet, about W. $\frac{1}{2}$ N. -----	nearly 38
Sandy Hook Light-vessel, W. by N. $\frac{1}{2}$ N. -----	6 $\frac{1}{2}$
Scotland Light-vessel, NW. by W. $\frac{1}{2}$ W. -----	nearly 2 $\frac{1}{2}$
Navesink Light-houses, N. $\frac{1}{2}$ W. -----	3 $\frac{1}{2}$

From this light-house

	Miles.
West Beacon bears NW. $\frac{3}{8}$ W.	about $\frac{1}{2}$
Hook Beacon N. by W. $\frac{1}{4}$ W.	$\frac{2}{3}$
Elm Tree Beacon NW. by N. $\frac{1}{4}$ N.	$7\frac{1}{2}$
Fort Tompkins Light-house N. $\frac{1}{2}$ W.	$8\frac{1}{2}$
The beacon on The Romer N. $\frac{1}{4}$ W.	$3\frac{1}{2}$

The West Beacon bears from the Hook Beacon S. $\frac{3}{8}$ W., distant half a mile, and is used in connection with Sandy Hook Light-house as a range for passing around Southwest Spit in the Main Channel.

The New Jersey Beach from Sandy Hook to the southward is very dangerous to careless navigators, as it is bold-to, and vessels which have not paid due attention to the set of the tidal current and the character of the soundings are apt to overrun their reckoning and get ashore.

When inside the Hook you will perceive that the Lower Bay spreads away to the westward and also to the northward. To the westward it extends for nearly eleven miles to the mouth of Raritan River; while to the northward the highlands of The Narrows are seen, with the works surrounding Fort Tompkins crowning the hills on the western side, and the granite walls of Fort Hamilton, with the red circular fort known as Fort Lafayette at its base, visible on the eastern side. To the western portion of the Lower Bay is given the name of **Raritan Bay**, and it receives the waters of Raritan River and Arthur Kill, (or Creek,) which latter separates Staten Island from the mainland. To the southern portion of the bay (that contained between Sandy Hook Point and Point Comfort) has been given the name of **Sandy Hook Bay**; and here is good anchorage in southerly, easterly or westerly winds.

The Jersey shore, from the Highlands of Navesink, extends in a direction about NW. by W. for seven miles and a half to Point Comfort, forming the southern side of Sandy Hook Bay. In the vicinity of the Highlands the land is high, rolling and thickly wooded; but to the westward, as far as the mouth of Raritan River, it is comparatively low and nearly level, with steep faces and a surface beautifully diversified with cultivated fields, ornamental grounds, groves of trees and thickly-clustered houses.

Three miles and a half to the westward of the Highland Light-houses and close to the southern shore of Sandy Hook Bay will be seen a tower painted in horizontal stripes of white, red and white, with a black frame on each side of it. This is Conover Beacon; and one mile and three-eighths to the southward of it, elevated upon the high land, will be seen another tower painted white. This latter is Chapel Hill Beacon; and the two in range are the guides for the Main Channel as far as The Narrows. Conover Beacon is a wooden tower fifty-five feet high, and shows a fixed white light, of the third order, from a height of sixty feet above the sea, visible thirteen miles. Its geographical position is

Latitude	40° 25' 14" N.
Longitude	74° 3' 22" W.

The black frames are so placed as to enable vessels to distinguish the beacon during the day, especially when the snow is upon the ground. Chapel Hill Beacon is a wooden tower forty feet high and painted white. It is situated one mile and three-eighths S. by W. $\frac{3}{8}$ W. from Conover Beacon, on the summit of a hill nearly two hundred feet high, and shows a fixed white light, of the second order, from a height of two hundred and twenty-four feet above the sea, visible twenty-one miles. These light-houses would be difficult to distinguish in time of snow were it not for the frames, colored black, which are built upon both sides of the two beacons. As it is they are easily recognized.

One mile and three-eighths to the westward of Conover Beacon is **Port Monmouth**, a small settlement of little commercial importance having about two thousand inhabitants. It is locally known as **Shoal Harbor**,—being bare at low water. One mile and three-quarters to the westward of this village and three miles and three-eighths to the westward of Conover Beacon is **Point Comfort Beacon**, or **Bayside Beacon**, which in conjunction with **Wilson's Beacon**, to the westward, forms the **Main Channel range**. **Bayside Beacon** is situated close to the southwestern shore of Sandy Hook Bay, amid low, nearly level, cultivated lands, and will appear as a white tower forty feet high, surmounted by a lantern with red top. It shows a fixed white light, of the third order, from a height of forty-five feet above the sea, visible twelve miles. For the convenience of vessels wishing to rate their chronometers its geographical position is given as follows:

Latitude	40° 28' 51" N.
Longitude	74° 7' 18" W.

Wilson's or Waackaack Beacon is situated three-quarters of a mile inland from Point Comfort Beacon and on somewhat higher ground. It is also painted white, is sixty-eight feet high, and shows a fixed white light, of the second order, from a height of seventy-six feet above the sea, visible fourteen miles.

Point Comfort, which is about seven-eighths of a mile to the northwestward of Bayside Beacon, is flat, sandy and backed by woods. It is not safe to approach it nearer than one mile and seven-eighths on account of the dangerous shoals which make off from it to the northward with from four to six feet upon them. Between this point and **Conaskonk Point**, (the southern point of entrance to Raritan Bay,) two miles to the westward, is formed a shallow bight known as **Waackaack Cove**, which is of no importance,—affording no shelter except in southerly winds, and then only for vessels of less than four feet draught.

Conasconk Point is flat and marshy, but is backed by a level, cultivated and thickly settled country. It forms the eastern point of entrance to **Middletown** or **Matawan Creek**, on the southern side of which is the village of **Keyport**. The harbor is not accessible except for light-draught steamboats,—having but four feet at low water through a narrow and intricate channel.

About four miles and a quarter to the northwestward of Keyport is the village of **South Amboy**, on the southern side of the entrance to **Raritan River**. It has a population of five thousand and is important as being the northern terminus of the **Camden and Amboy Railroad** between Philadelphia and New York. The northeastern point of entrance to the river and also the eastern point of entrance to **Arthur Kill** is **Ward's Point**,—the southwestern end of **Staten Island**. Between it and the **South Amboy wharves** the distance is a little over one mile; but the channel is very much obstructed,—being only about one hundred and fifty yards wide between the lines of two fathoms. The village of **Perth Amboy** is situated on the northern shore of **Raritan River** and on the western side of the entrance to **Arthur Kill**. It has a population of nearly four thousand and some coastwise trade.

Ward's Point is low, flat and grassy, with somewhat steep faces, and backed by cultivated lands thickly dotted with houses, forming the outskirts of the village of **Tottenville**, which occupies the eastern shore of **Arthur Kill**, at its entrance. The entrance to **Arthur Kill** is three-quarters of a mile wide, but soon diminishes to three hundred and fifty yards abreast of **Tottenville**, and at its narrowest part (opposite **Chelsea Landing**) is but one hundred and fifty yards wide. Not less than twelve feet at low water can be taken through this creek as far as **Elizabethport**; but its navigation requires the assistance of a local pilot.

Staten Island, which forms the northern shore of **Raritan Bay** and the northwestern shore of **New York Lower Bay**, is a large island, somewhat triangular in shape with its base to the northeastward, and a length of eleven miles and five-eighths. It lies **NE.** and **SW.**, and its backbone, which is composed of high wooded hills diversified with ornamental grounds dotted with villas, is one of the most conspicuous features of the approaches to **New York**. At its widest part, which may be said to be on a line drawn from the southern entrance to **The Narrows** to abreast of the town of **Elizabethport**, the island is about six miles and a half wide; and thence to the southwestward its width diminishes with great regularity until at its southern end it is barely one mile wide. This beautiful and fertile island shows, when seen from the eastward, an uninterrupted line of cultivated and well-settled country, backed by higher wooded lands with undulating outlines, and handsome houses appearing here and there among the trees. A description of its western shore belongs to **Arthur Kill** and the approaches to **Elizabethport**,—the eastern shore only being seen by vessels approaching **New York Harbor**. This eastern shore, as has been already mentioned, is composed of finely cultivated and well-settled lands backed by a hilly thickly wooded country.

One mile and seven-eighths to the eastward of **Ward's Point** (the southwestern end of **Staten Island**) and on the northern shore of **Raritan Bay** is **Princess Bay**, a small shallow indentation, famous only for the oysters produced upon the flats in this neighborhood. A tower of brown stone with dwelling of the same color attached stands upon a high bluff with steep sandy faces, on the western side of the bay, and shows a fixed white light (varied every two minutes by flashes of the same color) from a height of one hundred and six feet above the sea, visible sixteen miles. This tower, which is known as **Princess Bay Light-house**, was established principally as a guide to the entrance to **Raritan River**; but may also be used in clear weather as a range for the **Main Channel**. The course from the **Whistling Buoy (W. by N. $\frac{1}{4}$ N.)** leads directly for the light until **Point Comfort** and **Waackaack** beacons come in range.

The eastern point of entrance to **Princess Bay** is known as **Seguine Point**, and is flat and sandy, dotted with houses and backed by a rolling country of moderate height and under cultivation. A little over three miles to the eastward of this point is **Old Orchard Point**, the eastern point of entrance to a very shallow cove, for the most part bare at low water, and known as **The Great Kills**. This cove is about one hundred and fifty yards wide at its mouth, lies about **NE.** by **E.** and **SW.** by **W.** and is a little over one mile long. The country back of it is rolling and wooded, but there are many houses near the shore. **Old Orchard Point** is flat and sandy, with several houses near its western end and a line of low trees a little way back from the shore. All of this part of the shore is shoal,—eight feet being found seven-eighths of a mile to the southward of **Old Orchard Point**;—and vessels of larger draught than seventeen feet cannot approach the point nearer than two miles and a quarter.

Two miles and a half to the northeastward of **Old Orchard Point** will be seen a stone tower painted white with a red band around it. This is **Elm Tree Beacon**, the foremost tower of the **Swash Channel** range. It is fifty-five feet high and shows a fixed white light, of the third order, from a height of sixty-two feet above the sea, visible twelve miles. One mile and a half **NW. $\frac{1}{4}$ N.** from it, on a rising ground one hundred and fifty feet high, will be seen a white light-tower, known as **New Dorp Beacon**, which forms the back range for the **Swash Channel**. This tower, being painted white, is very readily discernible in the day-time against the background of trees which cover the crests to the westward of it. It shows a fixed white light, of the second order, from a height of one hundred and ninety-two feet above the sea, visible twenty miles and a quarter. When just open to the northward of **Elm Tree Beacon** on a bearing of **NW. $\frac{1}{4}$ N.** the course for it leads safely through the **Swash Channel** and is perfectly safe for strangers. The shore, however, must not be approached by large vessels nearer than two miles and five-eighths as it is foul.

From **Old Orchard Point** to **Fort Tompkins** the southeastern face of **Staten Island** trends about **NE. $\frac{1}{4}$ E.** for five miles and three-eighths, and is generally low and under cultivation for about one mile back from the shore, where the land is high, rolling and well wooded. Three miles to the northeastward of **Elm Tree Beacon** is the northeastern point of the island, easily recog-

nizable by **Fort Tompkins** and its subordinate works, which crown the heights and descend in regular terraces to the water's edge. Here, also, is situated the light-house, called **Fort Tompkins Light-house**, which marks the western point of entrance to The Narrows, and is built upon the top of a grey-colored dwelling with mansard roof. It shows a fixed white light, of the fourth order, from a height of ninety feet above the sea, visible fifteen miles; and the point may be passed within two hundred yards with not less than seven fathoms water. **Fort Tompkins** is a large earthwork built upon the summit of the **Clifton Hills** and close to the edge of the shore. The eastern face of the hill is regularly terraced by other earthworks; and at its base and extending a little way out in the water is a granite fort in an unfinished condition. The village of **Clifton** is beautifully situated on the slopes back of the light-house,—its white houses peeping out from among the surrounding foliage forming a very conspicuous part of the landscape in this vicinity.

A bank known as **West Bank** extends in a nearly S. direction from the point on which **Fort Tompkins** is built for a little over three miles; and upon the shoalest part of it are formed the artificial islands known as **Hoffmann Island** and **Dix Island**,—the sites of the Quarantine hospitals. **Dix Island**, which is the southermost, is easily recognized when standing in towards

The Narrows, as it will appear as a number of long, low, white houses, in front of which will be seen a two-story dwelling-house, also painted white, and standing apparently in the water. It is nearly in line between **Gravesend Point** (on **Coney Island**) and **Elm Tree Beacon** and is locally known as the **Lower Quarantine**. **Hoffmann Island**, which is known as the **Upper Quarantine**, is three-quarters of a mile to the northward of **Dix Island** and one mile and a quarter to the southward of **Fort Tompkins Light-house**. On approaching it from the southward it will appear as a mass of stone, brick and other debris, apparently loosely thrown together, and supporting two long brick houses two stories high. There is no passage except for small vessels between these islands and the **Staten Island** shore.

On the northern side of **Gravesend Point** an indentation is formed on the western end of **Long Island**, known as **Gravesend Bay**. It affords good anchorage in from twelve to fourteen feet at low water, but is seldom used except by vessels bound to **Gravesend** or **New Utrecht**. The bay is one mile and three-quarters wide at its mouth, between **Fort Hamilton** and **Gravesend Point**, and its shores are nearly level but slightly undulating, thickly settled and backed by dense woods. There are no dangers and vessels may stand with safety into the bay by using the lead with discretion.

The eastern side of the entrance to The Narrows is occupied by the village of **Fort Hamilton**, surrounding the fort of that name, which is easily recognized as a granite work standing upon a low grassy bluff close to the shore-line and surmounted by sodded traverses. There are several outlying batteries in the vicinity of the fort; and about a quarter of a mile to the westward of it, on the edge of the flats, is a circular work of brick, known as **Fort Lafayette**, built upon a stone foundation rising about three feet above the water. There is a fog-bell here, which, during thick weather, is struck one and two blows alternately at intervals of twenty seconds.

The eastern shore of The Narrows above **Fort Hamilton** is composed of nearly level land very thickly dotted with houses, with alternate cleared fields and groves of trees as far up as **Gowanus Bay**, three miles above, where begins the city of **Brooklyn**. It is quite bold to,—four fathoms being found within three hundred yards of the shore,—but the bay itself is obstructed for large vessels by **Gowanus Flats**, which make off in a southwesterly direction from **Red Hook** (the western end of the city of **Brooklyn**) for two miles and a quarter. The western shore of The Narrows, from **Fort Tompkins** to the southern point of entrance to **Kill Van Kull**, has a general direction about N. by W. for two miles and three-quarters and is formed by the northeastern end of **Staten Island**. There is an almost continuous settlement along this shore, formed by the villages of **Tompkinsville** and **New Brighton**, and it presents a beautiful appearance in summer,—the land rising somewhat steeply to thickly wooded hills with white houses dotting the slopes at intervals. The shore in the vicinity of **Tompkinsville** is terraced; and here is situated the principal depot of the **Light-house Establishment** with the great **Atlantic Docks** and warehouses in front.

The village of **New Brighton** joins **Tompkinsville** on the north and occupies the northern point of **Staten Island**. Here makes in **Kill Van Kull**, which separates the island from the mainland of **New Jersey** on the north as **Arthur Kill** separates it on the west. Here also begins the **Upper Bay**, which is nearly four miles in diameter at its widest part, (about midway between its northern and southern ends,) and gradually diminishes thence to the mouth of the **Hudson**, where it is but little over three-quarters of a mile wide.

Kill Van Kull, or **Van Kull's Creek**, runs between **Bergen Neck** and **Staten Island**, has an average width of about six hundred yards, is two miles and three-quarters long, and is good for four fathoms at low water through an almost unobstructed channel. It leads to the town of **Elizabethport** (at the northern end of **Arthur Kill**) and into **Newark Bay**, which separates **Bergen Neck** from the mainland and receives the waters of the **Hackensack** and **Passaic** rivers. The northern point of entrance to **Kill Van Kull** is called **Constable's Point**, and is the southeastern extremity of **Bergen Neck**. It is flat and grassy, has a number of houses upon it and several wharves on its southern side, and is somewhat shoal in its approaches, so that it should receive a berth to the northward of about an eighth of a mile. The eastern extremity of the point has a somewhat steep face with a height of about twenty feet; but elsewhere it is flat and level and but little elevated above high water. Marsh lands connect it with **Bergen Point**, the southwestern extremity of the neck and the eastern point of entrance to **Newark Bay**. This point, which is also low and nearly level,—being in no place higher than ten feet,—is occupied entirely by beautifully cultivated fields thickly dotted with houses. The southern shore of the neck to the

eastward of the point is the site of the village of **Bergen Point**, and the land has a slight rise,—being in some places between forty and fifty feet high. This shore is bold to off the village,—six fathoms being found within fifty yards of the wharf-line; but between the village and the point it is shoal and must receive a berth to the northward of about an eighth of a mile.

The southern shore of Kill Van Kull is formed as above mentioned by the northern shore of Staten Island, and is entirely occupied by the villages of New Brighton, **Factoryville**, **Port Richmond** and **North Shore**. These villages adjoin each other; and the houses near the shore being for the most part handsome villas and summer hotels surrounded by ornamental grounds, this shore in summer presents a beautiful appearance.

Newark Bay and its subsidiary streams will be described in place.

The eastern shore of the Upper Bay of New York is occupied for the most part by the city of Brooklyn, which extends from **Red Hook** (at the entrance of **Buttermilk Channel**) to the southern side of Gowanus Bay. From The Narrows to the southern limits of the city is a rolling country varying in height from forty to one hundred and twenty feet, diversified with cultivated fields and dense groves of trees and thickly dotted with houses. This part of the shore presents generally steep faces,—the bluffs in some places rising to a height of nearly one hundred feet. It is comparatively clean and may be safely approached with a judicious use of the lead,—only observing that, if intending to enter Gowanus Bay, large vessels must beware of **Gowanus Flats** and must not take the red buoy abreast of Tompkinsville as a guide, as it is placed a quarter of a mile to the westward of the southern end of the flats as a guide for vessels bound to New York.

Gowanus Bay is full of flats and strangers must not attempt to enter it. Not less than four and a half fathoms can, however, be taken into the bay from the southward, provided you do not go farther to the northward than to bring **Robbins' Reef Light-house** to bear **W. by N.** Gowanus Bay, though much frequented on account of its dry-docks and facilities for repairing vessels, is shallow and should not be entered without a pilot. Not more than seven feet at low water can be taken up to the docks, and there are dangerous middle grounds which are not buoyed and have from five to six feet water upon them.

The western shore of the Upper Bay is formed by Bergen Neck, and when seen from the southeastward appears low and nearly level and composed of cleared fields alternated with groves of trees and thickly clustered houses,—the latter marking the sites of the villages of **Centreville**, **Palmipaw**, **Salterville**, **Greenville** and **Communipaw**. By the curves of the shore between Constable's Point and the long wharf of the New York and Newark Railroad (at the southern end of Jersey City) is formed a bay about four miles long with a depth of from two to six feet in it, to which the local name of **Jersey Flats** is given. About two miles and a half above Constable's Point and one mile to the southward of Communipaw is **Caven's Point**, flat and sandy, with several houses upon it. Nearly all the shore between this point and Communipaw is marshy but is rapidly being filled in, as has been the case with the land to the northward of it, and an unbroken line of wharves will, in the course of a few years, be presented from the **Communipaw Docks** to Caven's Point.

The eastern edge of the Jersey Flats is plainly marked by natural as well as artificial objects. On their southeastern end, and on the northern side of the approach to Kill Van Kull, stands **Robbins' Reef Light-house**, a stone tower forty-six feet high, painted white, and showing a fixed white light, of the fourth order, from a height of fifty-eight feet above the sea, visible thirteen miles. During thick weather a bell is struck by machinery at intervals of fifteen seconds. This light-house bears from Fort Tompkins Light-house **N. $\frac{1}{2}$ W.**, distant three miles and three-eighths, and from Sandy Hook Light-house **N. $\frac{1}{2}$ W.**, distant twelve miles; and this course (if steered on the range) will carry not less than eleven feet at low water. The light-house must not be approached from the southward nearer than nine hundred yards and must receive a berth to the westward of a quarter of a mile.

One mile and five-eighths to the northward of Robbins' Reef Light-house is a small low islet on the eastern edge of the flats called **Oyster Island**. It is formed, artificially, (after the manner of Dix and Hoffmann islands in the Lower Bay,) by the dumping of stones, earth and other debris from the harbor. In passing it, it should receive a berth to the westward of about three hundred yards.

Three-eighths of a mile to the northward of Oyster Island, and on a direct line between Governor's Island and Caven's Point, is situated **Bedloe's Island**, also on the eastern edge of the flats. It lies **NW.** and **SE.**, is oval in shape and about three hundred and fifty yards long, and can be easily recognized by the stone fort on its summit near the southern end. There is a flag-staff a little to the southward; and to the northward and westward are seen several small houses and a few trees. On the extreme northwestern point of the island is a large brick house standing alone; and here there is a long wharf making out to the northward. **Bedloe's Island** may be approached within three hundred and fifty yards with not less than four fathoms water. The fort on it is known as **Fort Wood**, and has been selected as the site of the colossal statue of "Liberty Enlightening the World," when it shall have been presented by citizens of the French Republic.

Five-eighths of a mile to the northward of Bedloe's Island is **Ellis' Island**, also on the eastern edge of the flats, and the site of the **United States Magazine**. It lies **NW.** and **SE.**, is a little over two hundred yards long and seventy-five yards wide, and will appear when viewed from the eastward as a low grassy islet with several long low houses on its eastern side. In front of the houses will be seen a small stone fort. On its southwestern side there is a dwelling surrounded by a few trees, the only growth on the island. It may be approached from the eastward within a quarter of a mile with four fathoms, but there is no passage inshore of it. The island is only about nine hundred yards to the southward of the **Communipaw Docks** and nearly opposite, but a little below, **Castle Garden**.

Governor's Island, on the eastern side of the bay, lies in the middle of the entrance to the East River (see page 523) and is about eight hundred yards long **N NW.** and **S SE.** It is very nearly level and occupied entirely by **Fort Columbus** and the fortifications and outbuildings connected therewith. A prominent object on the island is a low circular stone fort on its northwestern end, on which there is a **fog-signal** in a framework structure, and consisting of a bell struck by machinery twice on quick succession at intervals of twenty seconds. There are many buildings surrounding the fortifications, and prominent among these will be seen a long, low brick house with gravel-covered roof. Also, upon the eastern and southeastern sides of the island, groves of low trees are seen, among which appear several dwellings,—the quarters of the officers stationed at the fort. On the extreme southern end of the island is a water-battery facing Buttermilk Channel, and the first work seen on approaching the island from the bay. It is an oblong work of stone, whitewashed and surmounted by traverses of earth and sod.

Above Governor's Island the North and East rivers come in, with the city of New York on the eastern bank and Jersey City on the west. Vessels usually anchor on the Jersey side, as the anchorage off The Battery is in the way of the numerous "tows" which come from up the Hudson and are bound into the East River.

DANGERS

IN APPROACHING AND ENTERING NEW YORK BAY AND HARBOR.

I. By Gedney's Channel, through the Main Channel.—When up with Sandy Hook light-vessel the course for the "Whistling Buoy" at the entrance to Gedney's Channel is **NW. $\frac{1}{2}$ N.** and the distance three miles and five-eighths. This buoy, called in the Buoy List the "Automatic Signal Buoy," is painted red and surmounted by a ten-inch air-whistle operated by the motion of the sea, and whose shriek has been heard at a distance of five miles. It is placed in nine fathoms at the eastern end of the channel range,—Princess Bay Light-house bearing **W. by N. $\frac{1}{4}$ N.**, distant thirteen miles and an eighth, and Sandy Hook Light-house **W. by S. $\frac{1}{2}$ S.**, distant three miles and three-quarters. When up with it the course leads towards Princess Bay Light-house, and a red can-buoy will be seen bearing about **NW. by W. $\frac{2}{3}$ W.**, distant half a mile; a black nun-buoy to the southward of the course, bearing **W. $\frac{1}{4}$ S.**, distant three-quarters of a mile; and a nun-buoy,* painted white and black in perpendicular stripes, directly ahead and half a mile off. The red buoy is a first-class can (No. 2) and is placed in twenty-two feet about four hundred yards to the southeastward of *an eighteen feet spot* off the eastern end of the Romer Shoal. The black buoy is a first-class nun (No. 1) and does not mark any particular shoal, but is simply a guide to keep vessels in the best water. It is about eight hundred and fifty yards **SW. $\frac{1}{2}$ S.** from the red buoy and is placed in five fathoms. The striped buoy is known as the "Entrance Buoy" to the Main Channel and is a nun* of the first-class, placed on the sailing-line in five and a half fathoms. It is surmounted by a perch and a ball. Vessels should keep this buoy in range with Princess Bay Light-house if the latter can be seen, and if not, should keep it in range with the Inner Mid-channel Buoy, which is also painted black and white in perpendicular stripes.

When up with the Entrance Buoy a black nun-buoy will be seen a little to the southward of the course, bearing about **W. $\frac{5}{8}$ N.** and one mile off. This is known as the "Inner Buoy" of Gedney's Channel and is placed on the northern side of *a seventeen and a half feet lump*. It is a nun of the first class, marked No. 3, and the sailing-line passes two hundred yards to the northward of it. About eight hundred and fifty yards to the westward of it is the "Inner Mid-channel Buoy," and about the same distance **N. $\frac{1}{8}$ W.** from it is a red can-buoy of the first class, marked No. 4, and placed in three and a quarter fathoms about half a mile to the southward of the eastern part of the Romer Shoal. This buoy bears from Sandy Hook Light-vessel **NW. $\frac{1}{2}$ W.**, distant a little over five miles, and from Sandy Hook Light-house **NE. $\frac{1}{2}$ E.**, distant two miles and three-quarters. The sailing-line passes six hundred yards to the southward of it, and its principal use is to guide vessels in beating;—the rule being not to stand to the northward of the range of this buoy and the red can surmounted by a perch and square about thirteen hundred yards to the westward of it. The Inner Mid-channel Buoy above mentioned is a first-class nun, painted black and white in perpendicular stripes, and marking the turning point from Gedney's into the Main Channel. It is placed on the range of the Bayside and Wilson's beacons, (called, in the Light-house List, **Point Comfort** and **Waackaack** beacons,) they bearing **W. by S. $\frac{1}{8}$ S.**; and that course leads directly through the Main Channel in the best water.

When up with the Inner Mid-channel Buoy a large red can-buoy will be seen well to the northward of the course, bearing about **NW. by W.** and eight hundred yards distant. This is placed a little to the southward of *a spit with from thirteen to eighteen feet upon it, making off* from the southern side of The Romer. It is a can of the first-class (No. 6), surmounted by a perch and square day-mark, and placed in three fathoms to keep vessels off the southern end of The Romer. The sailing-

line, which turns to the southwestward from abreast of the Inner Mid-channel Buoy, passes about six hundred yards to the southward of red buoy No. 6. The Romer, or *Romer Shoal* as it is frequently called, is an extensive sand shoal about five miles long and having an average width of three-quarters of a mile, which separates the East and Swash channels. It has from four to seventeen feet upon it and in some places is nearly bare at low water.

Its southeastern end marks the northern limits of Gedney's Channel, and it is upon a spur making off to the southward from this part of the shoal that the red buoy No. 6 is placed. To avoid the shoal at night vessels should not stand to the northward of Bayside or Point Comfort Beacon bearing **W.** by **S.** $\frac{1}{4}$ **S.**

When abreast of the red buoy No. 6 a nun-buoy will be seen to the northward of the course, bearing about **W.** and distant one mile. This is on what was formerly known as *Palestine Shoal*, but which has now no existence. The buoy is painted red and black in horizontal stripes, placed in five fathoms, and may be passed close-to on either hand with not less than four and a half fathoms at low water. The usual sailing-line, however, passes about four hundred yards to the southward of it.

Nearly one mile **S.** $\frac{1}{2}$ **E.** from Palestine Shoal buoy, and to the eastward of the northern end of Sandy Hook, will be seen another nun-buoy also painted red and black in horizontal stripes. This is on the northern end of False Hook Shoal, which extends in a **NW.** by **N.** and **SE.** by **S.** direction, at distances from Sandy Hook varying from half a mile to twelve hundred yards, and with a depth of from fourteen to sixteen feet at low water. The buoy, which is a nun of the second class, is placed in three fathoms on the northwestern end of the shoal and bears from Sandy Hook Light-vessel **W.** by **N.** $\frac{3}{4}$ **N.**, distant five miles and seven-eighths; from the Whistling Buoy at the entrance to Gedney's Channel **W.** by **S.**, a little over three miles; and from the Hook Beacon **E.** $\frac{3}{4}$ **S.**, distant three-quarters of a mile. It marks also the eastern side of the False Hook Channel and the western side of the South Channel. Vessels in beating must be careful, while to the eastward of Sandy Hook Point, not to stand to the southward of the Hook Beacon bearing **W.** by **S.**, by which means False Hook Shoal will be avoided.

False Hook Shoal.

When abreast of the horizontally-striped buoy on Palestine Shoal a red can-buoy will be seen to the northward of the course, bearing about **W.** by **N.** and half a mile off. This is off the eastern end of Flynn's Knoll, in four fathoms and on the northern side of the channel. Flynn's Knoll is a sand shoal one mile long **WNW.** and **ESE.** and has from ten to sixteen feet

Flynn's Knoll.

water upon it. At its western end it sends off a spur, known as *Southwest Spit*, half a mile long with from eleven to sixteen feet upon it; and a quarter of a mile to the eastward of the eastern end of the knoll is an *eighteen feet lump*, off which this red can-buoy is placed. The buoy is a first-class can, marked No. 8, and the sailing-line passes a quarter of a mile to the southward of it.

On the southern side of the channel, off Sandy Hook Point, will be seen two black nun-buoys about six hundred yards **NW.** and **SE.** of each other. The easternmost, a nun of the second class, marked No. 5, is off the eastern edge of the shoals off *Sandy Hook Point* and is placed in four and a half fathoms three-eighths of a mile **ENE.** Northerly from the Hook Beacon. The westernmost and most northerly is off the pitch of the hook and marks the northern limits of the shoal. It is a nun of the first-class (No. 5 $\frac{1}{2}$), and bears from the Hook Beacon **NNE.** Northerly, three-eighths of a mile, and from the red can-buoy (No. 8) on the eastern end of Flynn's Knoll **S.** $\frac{3}{4}$ **W.**, distant three-eighths of a mile. Almost exactly in line between these two buoys and equi-distant from them is placed a black spar-buoy, not numbered. The sailing-line passes nearer to buoy No. 5 $\frac{1}{2}$ than to the Flynn's Knoll buoy, (about two hundred yards off,) and continues to the westward, on the range of Bayside and Wilson's beacons, until the West Beacon and Sandy Hook Light-house are brought in range. On this course there will soon be seen, a little to the northward of the course and three-quarters of a mile off, (bearing nearly **W.**), a first-class red can-buoy surmounted by a perch and ball. This is off the southern side of *Southwest Spit*, (above mentioned,) is marked No. 8 $\frac{1}{2}$, and placed in four fathoms near the turning point in the Main Channel,—Sandy Hook Light-house and West Beacon being nearly in range and Wilson's Beacon open a little to the northward of Bayside Beacon,—the former bearing **W.** by **S.** $\frac{1}{4}$ **S.** and the red buoy off the western end of *Southwest Spit* **NW.** $\frac{3}{4}$ **W.**, distant thirteen hundred and fifty yards. This red buoy, which is a can of the first-class, marked No. 10, is on the sailing-line close to the northerly turn in the channel, where Conover and Chapel Hill beacons come in range. The course continues to the northwestward until the range of these beacons comes on, and then turns abruptly to the northward,—leading towards the eastern side of The Narrows.

At the turn in the course a red can-buoy will be seen bearing about **NE.** by **N.** $\frac{1}{2}$ **N.**, five-eighths of a mile off, and the buoy at the eastern end of the *Navy Trial Course* will appear nearly three-quarters of a mile to the westward, bearing about **W.** $\frac{1}{2}$ **N.** The red buoy, which is a first-class can (No. 10 $\frac{1}{2}$), is placed in four fathoms off the northwestern end of Flynn's Knoll and bears from the Hook Beacon **NW.**, two miles, and from the red buoy off the western end of *Southwest Spit* **N.** by **E.** $\frac{1}{4}$ **E.**, five-eighths of a mile distant. Vessels in beating in this vicinity should not stand to the eastward farther than to bring Conover Beacon to bear **S.** by **W.** $\frac{1}{4}$ **W.** to avoid *Southwest Spit*, Flynn's Knoll, and the East Knolls, to the northward of the latter.

The sailing-line passes three hundred yards to the westward of the red buoy (No. 10 $\frac{1}{2}$) off the northwestern end of Flynn's Knoll, and when abreast of it another red can-buoy will be seen a little to the eastward of the course and about five-eighths of a mile off, while a black nun-buoy will appear well to the westward, bearing about **N.** by **W.** $\frac{3}{4}$ **W.** and distant seven-eighths of a mile. The red buoy is a can of the first class, marked No. 12, and placed in four and a half fathoms on the western side of the East Knolls, an extensive area of shoal ground

East Knolls.

separating the Main and Swash channels and having from eleven to sixteen feet water upon it. It is one mile and three-eighths long N. by W. $\frac{3}{4}$ W. and S. by E. $\frac{3}{4}$ E., and three-quarters of a mile wide, and is marked only by the above-mentioned buoy. It is, therefore, necessary for vessels of large draught to be careful not to stand too far to the eastward when in its vicinity.

The black nun-buoy on the western side of the channel is placed about three hundred and fifty yards to the eastward of the southern end of the West Knolls,—a shoal about seven-eighths of a mile long NE. by N. $\frac{1}{2}$ N. and SW. by S. $\frac{1}{2}$ S., with sixteen feet water upon it and not less than three and a half fathoms on all sides of it. The buoy, which is of the first class, is marked No. 7, placed in three and a half fathoms, and bears from the red buoy off the western end of Southwest Spit N. by W., distant one mile and a half. From this buoy the southernmost of the buoys off Staten Island Flats bears N. by E. $\frac{3}{4}$ E., distant two miles.

At the northern end of the East Knolls is the junction of the Swash with the Main Channel, and six hundred and fifty yards to the northward of the knolls will be seen a nun-buoy of the first class, painted red and black in horizontal stripes. This buoy is in five fathoms one mile N. by E. from the red can-buoy (No. 12) off East Knolls and one mile and an eighth NE. $\frac{1}{4}$ E. from the black buoy off West Knolls. The sailing-line passes about four hundred yards to the westward of it, and when abreast of it a red can-buoy (No. 8) will be seen well to the eastward, bearing about E. by N. $\frac{3}{4}$ N. and eleven hundred yards off. This is on the western side of the northern part of The Romer and marks the eastern limits of the Swash Channel. To vessels coming up the Main Channel it is useful only to keep them from standing too far to the eastward when beating. The rule is to go about as soon as you open Chapel Hill Beacon to the eastward of Conover Beacon. This rule avoids also the red can-buoy on the northern end of The Romer, which will appear (when abreast of the striped nun-buoy at the junction of the Main and Swash channels) a little to the eastward of the course, bearing about NE. by N. $\frac{1}{2}$ N., one mile and a quarter distant. The buoy is marked No. 14, placed in twenty-two feet at low water,—Lower Quarantine bearing N. by W. $\frac{3}{4}$ W., Fort Tompkins Light-house N. $\frac{3}{4}$ W., and Gravesend Point (the western extremity of Coney Island) NE. by N. $\frac{1}{4}$ N.

Directly opposite to the red can-buoy (No. 14), bearing about W. by N. $\frac{3}{4}$ N. from it and distant five-eighths of a mile, will be seen a black nun-buoy; while about three-quarters of a mile to the eastward, bearing about E. $\frac{1}{2}$ N., will appear a large red spar-buoy. The black nun (No. 9) is on the eastern side of the great Staten Island Flats, which make off from the eastern shore of that island to distances varying from one mile and three-quarters to two miles and five-eighths with depths over them varying from one to sixteen feet. These flats include within their limits *Round Shoal* and *Old Orchard Shoal*, (which obstruct the approach to Raritan Bay,) and the great West Bank, which forms the western limits of the Main Channel into New York and upon which the artificial islands forming the Lower and Upper Quarantine stations have been constructed. The red spar-buoy (No. 6) to the eastward is placed off the western end of an arm of the East Bank, which separates the East Channel from the Fourteen Feet Channel,—the latter leading between this arm and the main body of East Bank. At this point all the channels unite, giving an unobstructed passage of about one mile and a quarter wide as far up as The Narrows.

The East Bank is an extensive sand shoal about one mile and a quarter in diameter, which extends to the southward from Coney Island and has from three to eighteen feet water upon it. The shoal lumps are scattered all over the bank,—five feet being found one mile and a half and three feet one mile and a quarter to the southward of *Manhattan Beach*, and ten feet close to the southern and western edges of the bank. It is, therefore, very necessary to be careful in approaching this side of the channel, and a good rule is not to stand farther to the eastward than to bring Fort Lafayette to bear N. $\frac{3}{4}$ W., by which means the East Bank will be avoided. About half a mile NE. by N. $\frac{1}{2}$ N. from buoy No. 6 will be seen a red spar-buoy (No. 4). This also marks the western edge of the East Bank, but is of no importance to vessels bound up the Main Channel,—being placed as a guide to the Fourteen Feet Channel, which crosses the southern end of the East Bank. The buoy marks the northern side of the western entrance to this channel.

Seven-eighths of a mile N. by E. from the black nun-buoy on the eastern side of Staten Island Flats will be seen another black nun-buoy, which marks the southeastern end of the great West Bank. This shoal, which forms the northeastern extremity of the Staten Island Flats, makes in a S. $\frac{1}{4}$ W. direction from Fort Tompkins (on the western side of the entrance to The Narrows) for a little over three miles. It is bare in some places at low water and in others has from one to ten feet upon it; and being bold-to on its eastern side would be very dangerous were it not for the buoys and the two artificial islands, known as *Dix* and *Hoffmann* islands, which serve as guides to avoid it. The nun-buoy on the southeastern end of the bank is of the first class, marked No. 11, and placed in three and a half fathoms just clear of the flats,—*Dix Island* bearing N. by W. $\frac{3}{4}$ W., distant three-quarters of a mile. The sailing-line passes about three hundred and fifty yards to the eastward of it; and when abreast of it another black nun-buoy (No. 13) will be seen to the westward of the course, bearing about N. by W. and seven-eighths of a mile off. This is locally known as the "Lower Quarantine Buoy," though in reality it marks the eastern edge of the West

Bank. Well to the eastward, bearing about **NE.** by **E.** $\frac{1}{4}$ **E.** and distant one mile and a quarter, will be seen a red can-buoy, which is on the northwestern extremity of East Bank. It is marked No. 16, placed in four and a quarter fathoms, and to avoid it as well as the East Bank vessels should not stand to the eastward of Robbins' Reef Light-house bearing **N.** by **W.**

The black buoy off Lower Quarantine (No. 13) is placed in three and a half fathoms about six hundred yards to the eastward of Dix Island. When abreast of it a spar-buoy painted red and black in horizontal stripes will be seen to the westward of the course, bearing about **N.** $\frac{1}{2}$ **W.** and one mile and an eighth off. This is on Craven's Shoal, a detached lump with eighteen feet at low water, lying about fourteen hundred yards **NE.** by **E.** $\frac{1}{2}$ **E.** from Upper Quarantine or Hoffmann Island and one mile **S SE.** from Fort Tompkins Light-house. The buoy is placed close to the shoal, on its eastern side, and may be safely passed on either side; but the sailing-line passes about six hundred yards to the eastward of it. When abreast of the buoy two black buoys *Craven's Shoal.* (the southernmost a nun and the northernmost a spar) will be seen well over towards the Staten Island shore, just below the entrance to The Narrows; while there are no buoys on the eastern side of the channel. These two buoys are placed on the eastern edge of the West Bank, near its northern end, to mark the western limits of the channel. The nun is No. 15 and the spar No. 15 $\frac{1}{2}$. When past them the channel through The Narrows is fairly open and there are no obstructions, except that vessels must give the eastern shore of The Narrows a berth of a quarter of a mile, or, in other words, must not go inside of Fort Lafayette.

When past The Narrows, on the course for Robbins' Reef Light-house, there will soon be seen to the eastward of the course a red can-buoy. This buoy, which is marked No. 18, is placed in four and a half fathoms abreast of the southwestern end of Gowanus Flats, which make off in a **SW.** $\frac{1}{4}$ **S.** direction from Red Hook (the northern point of entrance to Gowanus *Gowanus Flats.* Bay) for two miles and an eighth. They have from ten to fifteen feet water upon them and are difficult to avoid unless the buoy can be seen, as a long pocket with from three to seven fathoms in it makes in on the eastern side of the flats and the lead cannot therefore be depended upon. It is best for strangers, for this and other reasons, to take a tow-boat at Tompkinsville.

On approaching Robbins' Reef Light-house a black nun-buoy will be seen about a quarter of a mile to the southward of it. This buoy, which is marked No. 17, is placed in three fathoms on the southeastern extremity of the Jersey Flats (sometimes called *Bergen Flats*) of which *Robbins' Reef* forms a part. The Jersey Flats lie on the western side of the Upper Bay of New York, between Constable's Point (the southeastern extremity of Bergen Neck) and *Jersey Flats.* the Communipaw Docks, at the western point of entrance to the Hudson. Their eastern extremity is from one mile and an eighth to two miles from shore and is pretty well marked by Robbins' Reef Light-house, Oyster Island, Bedloe's Island and Ellis' Island. By giving each of these islands a berth to the westward of not less than a quarter of a mile vessels will pass clear of the flats.

The Jersey Flats have from three to six feet water upon them where they are not bare; and vessels must not, therefore, attempt to cross them or to pass inside of the islands.

When abreast of Robbins' Reef Light-house a red spar-buoy (with cage on top) will be seen well to the eastward of the course, bearing about **NE.** by **E.** $\frac{1}{4}$ **E.** and one mile and an eighth off. This buoy, which is marked No. 20, is placed off the western edge of Gowanus Flats, near their northern end, and bears from the red can-buoy off the southwestern end of the same flats **NE.** by **N.**, one mile and five-eighths, and from Robbins' Reef Light-house **E.** by **N.** $\frac{1}{4}$ **N.**, one mile and a half distant. From this buoy the black spar-buoy on Governor's Island West Shoal bears **NE.** by **N.**, one mile and an eighth, and the black spar-buoy on Oyster Island Flats **N.** by **W.** $\frac{3}{4}$ **W.**, one mile distant.

This black buoy on Oyster Island Flats is one mile and three-quarters to the northward of the black buoy off Robbins' Reef Light-house. It is marked No. 19 and is placed in three and a half fathoms about four hundred yards to the eastward of Oyster Island and nine hundred yards to the southward of Bedloe's Island. When up with it the sailing-line passes about six hundred yards to the eastward of it and there will be seen, on the eastern side of the *Oyster Island Flats.* channel off Governor's Island, a black spar-buoy (No. 1). This marks the southwestern extremity of *Governor's Island West Shoal*, which makes off from the western side of that island for about nine hundred yards, and also marks the northern side of the entrance to Buttermilk Channel from the westward. Governor's Island West Shoal is easily avoided, even should the buoy be gone, as the water shoals very gradually and it is only necessary to use the lead and go about or keep off, according to draught.

When past Governor's Island there are no dangers,—it being only necessary to give Bedloe's and Ellis' islands a berth to the westward of a quarter of a mile, and to be careful on the flood tide not to be drawn into the current of the East River.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING NEW YORK BAY AND HARBOR.

I. *By Gedney's Channel, through the Main Channel.*—When up with Sandy Hook Light-vessel, if the weather be thick and the sea heavy, the Whistling Buoy at the entrance to the Main Channel

Sailing Direc- will certainly be heard, even should the light-vessel not be visible, as its shriek has
tions---New been reported as having been heard at a distance of five miles. It may be safely
York Harbor. steered for when heard; and when up with it the course through the Main Channel
 will be **W.** by **N.** $\frac{1}{8}$ **N.** In clear weather **NW.** $\frac{1}{4}$ **N.** from the light-vessel for three
 miles and a half will bring you up with the buoy; and on this course there will not be less than eight
 and three-quarters fathoms. Now steer **W.** by **N.** $\frac{1}{8}$ **N.** for the Entrance Buoy, (perpendicular stripes,) which is placed on the sailing-line nearly midway between the red buoy (No. 2) and the black buoy (No. 1). When up with the Entrance Buoy continue on the same course (with Princess Bay Light-house directly ahead) for the buoy at the turn of the channel, (also perpendicular stripes.) On this course there will not be less than twenty-three feet and you will pass about an eighth of a mile to the northward of the black buoy (No. 3). At the turning point there is a depth of six fathoms and three-quarters at mean low water, and Bayside and Wilson's beacons will be in range; and thence the course through the Main Channel is **W.** by **S.** $\frac{1}{8}$ **S.** for nearly three miles (keeping the range) until past Sandy Hook and the light-house and West Beacon are in range. On this course there will not be less than twenty-six feet, and when the range comes on the depth will be thirty-five feet. Now steer **NW.** $\frac{1}{2}$ **W.** for about one mile, (on the range of West Beacon and the light-house,) carrying not less than twenty-seven feet, until past the red buoy (No. 10) off the western end of Southwest Spit and Conover and Chapel Hill beacons are brought in range on a bearing of **S.** by **W.** $\frac{1}{4}$ **W.** Now steer **N.** by **E.** $\frac{1}{8}$ **E.**, (keeping the range,) which will lead safely up the channel, past The Romer, and between East and West banks,—the least water (twenty-two feet) being found just after passing the red buoy (No. 10 $\frac{1}{2}$) marking the northwestern end of Flynn's Knoll. This course should be continued until past Hoffmann Island (Upper Quarantine) and Fort Tompkins Light-house bears **NW.** by **N.**, distant one mile and three-eighths, when the course through The Narrows will be **N.** by **W.** directly for Robbins' Reef Light-house, and should be continued until abreast of Tompkinsville. It is strongly recommended to sailing vessels to take a tug-boat to New York from this point, as the frequently crowded state of the Upper Bay renders its navigation exceedingly difficult for other than steamers and collisions are frequent. Should it be necessary, however, to proceed up under sail, the best course from off Tompkinsville (with Robbins' Reef Light-house bearing **N.** $\frac{3}{4}$ **W.**, one mile and an eighth, and the western end of Governor's Island **NE.** $\frac{3}{4}$ **N.**, three miles and five-eighths distant) will be **NE.** by **N.** $\frac{1}{2}$ **N.**, carrying not less than five fathoms, until past The Battery; when, if intending to anchor on the Jersey shore, you should haul over towards that shore and anchor in from three to four and a half fathoms, muddy bottom. Vessels intending to go into dock on the New York side will, of course, take a tow-boat.

In this connection strangers would do well to consult the Extracts from the Harbor Regulations of New York, given in Appendix No. II.

The above courses pass a little over half a mile to the southward of the eastern extremity of The Romer; three-eighths of a mile to the southward of the southern end of The Romer, (marked by red buoy No. 6 with perch and square;) two hundred yards to the northward of the black nun-buoy near the seventeen and a half feet lump; between five and six hundred yards to the southward of the red can-buoy on the northern side of the channel, (between the southeastern and southern ends of The Romer;) a quarter of a mile to the southward of the striped buoy on Palestine Shoal; the same distance to the southward of the red buoy off the eastern end of Flynn's Knoll; about one hundred and fifty yards to the northward of the black buoy off the northern end of Sandy Hook; fifty yards to the westward of the red can-buoy (surmounted by perch and ball) off the southern side of Southwest Spit; close to the red can-buoy (No. 10) off the western end of Southwest Spit; three hundred and fifty yards to the westward of the red can-buoy (No. 10 $\frac{1}{2}$) off the northwestern end of Flynn's Knoll; four hundred yards to the westward of the red can-buoy on the western side of East Knolls; about nine hundred yards to the eastward of the black nun-buoy off West Knolls; three hundred yards to the westward of the striped nun-buoy off the northern end of East Knolls; a quarter of a mile to the eastward of the black nun-buoy (No. 9) off the southeastern end of Staten Island Flats; seven hundred yards to the westward of the red can-buoy (No. 14) on the northern end of Romer Shoal; four hundred yards to the eastward of the black nun-buoy (No. 11) on the southeastern end of West Bank; seven-eighths of a mile to the westward of the red can-buoy (No. 16) off the northern end of East Bank; three-eighths of a mile to the eastward of the black buoy (No. 13) on the eastern side of West

Bank abreast of Dix Island; six hundred yards to the eastward of the striped buoy on Craven's Shoal; over half a mile to the eastward of the black buoys (Nos. 15 and 15 $\frac{1}{2}$) marking the eastern edge of West Bank at its northern end; seven hundred yards to the westward of the red buoy on the southwestern end of Gowanus Flats; six hundred yards to the eastward of the black buoy on the southern end of Robbins' Reef; a little over five hundred yards to the eastward of the black buoy marking the eastern side of Oyster Island Flats; and half a mile to the westward of the black spar-buoy on the western extremity of Governor's Island West Shoal.

DANGERS

IN APPROACHING AND ENTERING NEW YORK BAY AND HARBOR.

II. *By Gedney's Channel, through the Swash Channel.*—The course from the Whistling Buoy through Gedney's Channel is, as before mentioned on page 564, W. by N. $\frac{1}{2}$ N. towards Princess Bay Light-house. On this course you will pass to the southward of the red can-buoy (No. 2) off the southeastern end of Romer Shoal, to the northward of the black nun-buoy (No. 1) on the southern side of the entrance, and close to the "Entrance Buoy," which is painted black and white in perpendicular stripes and surmounted by a perch and ball. When to the westward of these buoys you will pass about two hundred yards to the northward of the black nun-buoy near the *seventeen and a half feet lump*, between five and six hundred yards to the southward of the red can-buoy (No. 4) between the southern and southeastern ends of The Romer, and close to the "Inner Mid-channel Buoy," which is a nun of the first class, painted black and white in perpendicular stripes. The course must be continued towards Princess Bay Light-house (passing about three hundred and fifty yards to the southward of the red can-buoy (with perch and square) off the southern end of The Romer) until Sandy Hook Light-house bears S SW., when the New Dorp Beacon will be open a little to the northward of the Elm Tree Beacon and the course through the Swash Channel will lead directly for the latter, passing about seven hundred yards to the northward of the striped nun-buoy on Palestine Shoal. (See also pages 560–561 for description of the above dangers.)

At this turning point in the channel a red can-buoy will be seen nearly abeam, bearing about NE. by N. and six hundred and fifty yards off. It is marked No. 4, placed in four and a quarter fathoms, and, although not indicating any particular shoal, is intended to keep vessels off the south side of The Romer. From the red can-buoy (with perch and square) off the southern end of The Romer it bears NW. by W. $\frac{3}{4}$ W., five-eighths of a mile, and from the Inner Mid-channel Buoy NW. by W. $\frac{3}{4}$ W., about one mile distant. The sailing-line passes six hundred yards to the westward of it. When abreast of it another red can-buoy (No. 6) will be seen to the eastward of the course, bearing about N. $\frac{1}{2}$ W. and half a mile off. This is on the western side of The Dry Romer, at its southern end, and is placed in three and a half fathoms four miles NW. by N. $\frac{1}{2}$ N. from Scotland Light-vessel and three-eighths of a mile NW. $\frac{1}{2}$ W. from the red can-buoy (No. 4) above mentioned. There should be a large black buoy on the western side of the channel, about eight hundred yards SW. from this buoy, to mark the southeasternmost of the East Knolls; and such action will be recommended.

About five-eighths of a mile W. by N. from the red buoy (No. 6) off the southeastern end of The Dry Romer will be seen a black nun-buoy. This buoy, which is marked No. 3, is on a *sixteen feet spot* to the eastward of the East Knolls, in three and a half fathoms water. While to the southward of it, vessels must not go to the westward of Elm Tree Beacon bearing NW. $\frac{1}{4}$ N. in order to avoid the *other detached shoals* of the East Knolls which lie to the southeastward of the buoy. Should these be buoyed, as recommended above, there will be no danger except during thick weather.

About seven hundred yards to the northwestward of this buoy (No. 3) will be seen a large spar-buoy painted red and black in horizontal stripes. This marks a sixteen feet shoal known as the New Shoal, which lies nearly in mid-channel, with the Hook and West beacons nearly in range. You may pass on either side of this buoy, but it is usual to leave it to the westward. When up with it a black nun-buoy will be seen to the westward of the course, about three-quarters of a mile off, and a conical stone beacon well to the eastward and about nine hundred yards distant. The former, which is placed in twenty feet, marks the eastern edge of the East Knolls near their northern end, and is a second-class nun, marked No. 5. The latter is on the shoalest part of The Dry Romer, and is a granite structure surmounted by a mast and square cage,—bearing from

	Miles.
The Whistling Buoy at the entrance to Gedney's Channel, NW. by W. $\frac{1}{2}$ W.	4 $\frac{1}{4}$
Sandy Hook Light-vessel, NW. $\frac{3}{4}$ W.	7 $\frac{3}{4}$
The striped buoy at the entrance to the South Channel, NW. $\frac{1}{2}$ N.	4
Scotland Light-vessel, NW. by N. $\frac{1}{4}$ N.	5 $\frac{1}{8}$
Sandy Hook Light-house, N. $\frac{1}{4}$ W.	3 $\frac{1}{8}$

From this beacon the red can-buoy on the northwestern end of The Romer bears **NW. $\frac{1}{4}$ W.**, distant one mile, and Fort Tompkins Light-house **N. by W.**, distant five miles and a half; upon which course not less than thirteen feet can be carried across the shoal. The Dry Romer, which is *The Dry Romer*, the name given to the shoalest part of Romer Shoal, lies **NW. and SE.**, is one mile and three-eighths long and has upon it from four to nine feet at low water. It is especially dangerous to vessels using the Swash Channel, as the set of the ebb is directly upon it; but a careful watch of the head range of Elm Tree and New Dorp beacons will prevent disaster.

When abreast of the beacon on The Dry Romer a red can-buoy will be seen a little to the northward of the course, bearing about **NW. by N. $\frac{1}{8}$ N.**, distant one mile; and a nun-buoy, painted red and black in horizontal stripes, to the southward, bearing **NW. $\frac{3}{4}$ W.**, distant one mile and an eighth,—the sailing-line passing about midway between them. The former marks the northwestern edge of the *Romer Shoal*, is a first-class can, marked No. 8, and placed in four fathoms,—Dix Island bearing **N. by W.**, distant two miles and five-eighths, and the red buoy on the northern end of The Romer **N. $\frac{1}{4}$ E.**, distant seven-eighths of a mile. The striped buoy on the western side of the channel is a nun of the first class, placed in five fathoms about six hundred and fifty yards to the northward of the northern end of East Knolls and at the junction of the Swash Channel with the Main. From this buoy the black nun-buoy (No. 9) off Staten Island Flats bears **N. $\frac{3}{4}$ W.**, distant one mile and a quarter, and the red can-buoy (No. 14) on the northern end of Romer Shoal **N. by E. $\frac{1}{4}$ E.**, distant one mile and an eighth.

Beyond this buoy you are in the Main Channel, and the dangers are the same and are met with in the same order as described on pages 562–563.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING NEW YORK BAY AND HARBOR.

II. By the Swash Channel.—This channel must never be attempted in thick weather or when the range of Elm Tree and New Dorp beacons cannot be seen, as the set of the tidal current is diagonally across it and vessels are in danger of being set upon The Romer or the East Knolls. In clear weather, however, it is both safe and easy and is frequently used.

From Sandy Hook Light-vessel steer **NW. $\frac{1}{8}$ N.** for the Whistling Buoy, carrying not less than eight and three-quarter fathoms, and when up with it steer **W. by N. $\frac{1}{8}$ N.** through Gedney's Channel, heading for Princess Bay Light-house, and carrying not less than twenty-three feet until well past the red buoy (No. 6) with perch and square and the range of Elm Tree and New Dorp beacons is nearly on,—the latter being open a little to the northward. From this position Elm Tree Beacon will bear **NW. $\frac{1}{4}$ N.** and Sandy Hook Light-house **SSW.** and you must steer for the former,—being careful, on the flood tide, not to bring it in range with New Dorp Beacon. On this course you will have not less than four and a quarter fathoms and will pass about four hundred yards to the westward of the beacon on The Dry Romer. Continue the course until Conover and Chapel Hill beacons are in range on a bearing of **S. by W. $\frac{1}{8}$ W.**, when you will be in the Main Channel and must steer **N. by E. $\frac{1}{8}$ E.**, following the directions given for that channel on page 564.

The above courses pass a little over three hundred yards to the southward of the red buoy No. 6 (with perch and square) marking the southern end of Romer Shoal; nearly six hundred yards to the westward of the red buoy (No. 4) off the southern side of Romer Shoal; six hundred yards to the westward of the red can-buoy (No. 6) off the southeastern end of The Dry Romer; about two hundred yards to the eastward of the black nun-buoy (No. 3) on the eastern side of the East Knolls; the same distance to the eastward of the horizontally-striped spar-buoy on the New Shoal; a quarter of a mile to the westward of the stone beacon on The Dry Romer; between five and six hundred yards to the eastward of the black buoy (No. 5) on the eastern side of the East Knolls; an eighth of a mile to the westward of the red buoy (No. 8) on the northwestern side of Romer Shoal; and five hundred yards to the eastward of the striped buoy off the northern end of the East Knolls.

Or when, on the course W. by N. $\frac{1}{8}$ N. from the Whistling Buoy, you come up with the Inner Mid-channel Buoy (perpendicular stripes) and Bayside and Wilson's beacons are in range on a bearing of **W. by S. $\frac{1}{8}$ S.**, steer for the beacons (keeping the range) for five-eighths of a mile until Elm Tree and New Dorp beacons are nearly in range,—the latter being open a little to the northward. Here the depth will be five fathoms and the course **NW. $\frac{1}{4}$ N.** for Elm Tree Beacon, following the directions given above.



ENTRANCE TO NEW YORK BAY

Scale 6000

1880



BUOYS
 Red Buoy to be left in entering on Starboard hand
 Black Buoy to be left in entering on Port hand
 Black and Red horizontal stripes Danger Buoy
 Black and White perpendicular stripes Channel Buoy

SOUNDINGS
 Soundings in Italics are mean low water
 Depth less than 20 fathoms in feet on a shaded surface

Or, from *Sandy Hook Light-vessel*, a vessel intending to go through the *Swash Channel* may steer NW. by W. $\frac{1}{2}$ W., carrying not less than nineteen feet, until *Sandy Hook Light-house* bears SSW., when *Elm Tree Beacon* will bear NW. $\frac{1}{4}$ N., with *New Dorp Beacon* open a little to the northward of it. Now steer in on that range, which will lead safely through the *Swash Channel* to its point of junction with the *Main*.

DANGERS

IN APPROACHING AND ENTERING NEW YORK BAY AND HARBOR.

III. *Through the South Channel into the Main or Swash Channel.*—This channel is only used by vessels from the southward, or by those from the eastward which have fallen in to the southward of *Sandy Hook*, or by sailing vessels which, on coming up with *Sandy Hook Light-vessel*, find the wind too far to the northward to enable them to enter *Gedney's* or the *Swash Channel*. It lies just to the southward of *Gedney's Channel*, and is separated from *False Hook Channel* by *False Hook Shoal*. Vessels from the southward make *Scotland Light-vessel* and proceed from it; but those from the eastward make *Sandy Hook Light-vessel* and steer to the westward for the "Entrance Buoy," keeping *Scotland Light-vessel* a little to the southward of the course. This buoy is a first-class nun, painted black and white in perpendicular stripes, and placed in forty feet water a little over two miles and three-quarters W. $\frac{3}{4}$ N. from *Sandy Hook Light-vessel* and seven-eighths of a mile E. by N. $\frac{1}{2}$ N. from *Scotland Light-vessel*. From this buoy the *Whistling Buoy* at the entrance to *Gedney's Channel* bears N. $\frac{3}{4}$ E., distant nearly two miles and a quarter; *Sandy Hook Light-house* W. by N. $\frac{1}{2}$ N., distant three miles and a half; and the *Inner Mid-channel Buoy (South Channel)* NW. $\frac{1}{4}$ N., distant nearly one mile and a half.

When up with the *Entrance Buoy* a black nun-buoy will be seen to the westward of *Scotland Light-vessel*, bearing about W. $\frac{1}{2}$ S., and distant nearly one mile and a quarter. This buoy, which is marked No. 1, is placed in three and a half fathoms on the western side of the channel and is intended to keep vessels off the southeastern end of *False Hook Shoal*. It bears from the *Entrance Buoy* W. $\frac{1}{2}$ S., one mile and a quarter; from *Scotland Light-vessel* W. by N. $\frac{1}{2}$ N. Northerly, eight hundred and fifty yards; and from *Sandy Hook Light-house* SE. by E. $\frac{1}{4}$ E., two miles and three-eighths distant. From this buoy the black spar-buoy (No. 3) placed off the eastern side of *False Hook Shoal* bears NNW., distant three-quarters of a mile. This black spar-buoy is the next met with after passing the *Entrance Buoy*, and in common with the black nun-buoy just described is placed as a guide to vessels beating through the channel. It is in three fathoms off an easterly spur of *False Hook Shoal*, and bears from the *Entrance Buoy* W. by N. $\frac{3}{4}$ N., distant one mile and five-eighths, and from *Scotland Light-vessel* NW. $\frac{1}{2}$ N., distant one mile. From this buoy the striped nun-buoy on the northwestern end of *False Hook Shoal* bears NW. $\frac{1}{4}$ W., distant one mile and five-eighths; *Sandy Hook Light-house* W. by N. $\frac{1}{2}$ N., distant one mile and seven-eighths; and the middle of the entrance to the *Swash Channel* NW. by N. $\frac{1}{2}$ N., distant three miles.

The *False Hook Shoal* is a sand shoal one mile and three-quarters long NW. by N. $\frac{1}{4}$ N. and SE. by S. $\frac{1}{4}$ S., with from twelve to sixteen feet water upon it. It is narrow except at its southern end, where it has a width of about three-quarters of a mile over *The Oil Spot*, which is all that remains now of a sunken wreck in this position. The main body of the reef has a width of about three hundred yards; and about one mile and an eighth below its northern end it sends off a fourteen feet spur to the eastward for three-eighths of a mile, which is marked by the black spar-buoy (No. 3) mentioned above; while the black nun-buoy (No. 1) is placed off the southeastern end of *The Oil Spot*.

False Hook Shoal.

The "Inner Mid-channel Buoy" of the *South Channel* is a first-class can, painted black and white in perpendicular stripes, and placed in twenty-two feet at low water. It bears from *Sandy Hook Light-vessel* WNW., distant four miles; from the *Entrance Buoy* NW. $\frac{1}{4}$ N., one mile and a half; and from *Scotland Light-vessel* N. $\frac{1}{2}$ W., distant one mile and three-eighths. From this buoy the entrance to the *Swash Channel* bears NW. $\frac{1}{8}$ N. and *Sandy Hook Light-house* W.,—the latter being distant two miles and three-eighths.

When up with the *Inner Mid-channel Buoy* a large nun-buoy will be seen about half a mile to the northeastward. It is painted red and black in horizontal stripes and is locally known as "The Lump Buoy," but is not approached by vessels using the *South Channel* unless they are standing to the eastward on a wind. It is placed to the eastward of and close to an eighteen feet shoal in mid-channel, called *The Lump*; and by giving it a berth of a quarter of a mile it may be passed with safety on either hand with not less than three and three-quarter fathoms.

The Lump.

When past the *Inner Mid-channel Buoy*, if bound through the *Swash Channel*, or into the *Main Channel* by the usual course, there is nothing in the way until you are to the northward of *Sandy Hook Point*; but if standing to the westward on a wind, you should go about as soon as *Elm Tree Beacon* bears NW. $\frac{1}{4}$ N. or *Scotland Light-vessel* SE. $\frac{1}{4}$ S. By this means you will avoid *False Hook Shoal*,

(before described,) on the northwestern end of which will be seen a nun-buoy painted red and black in horizontal stripes. This buoy is placed in three fathoms,—the Hook Beacon bearing **W. $\frac{3}{4}$ N.** Northerly, three-quarters of a mile, and Sandy Hook Light-house **SW. $\frac{1}{4}$ W.**, the same distance. From this buoy the two black buoys off the Hook are nearly in range on a bearing of **NW. $\frac{3}{4}$ W.**, and the striped buoy on Palestine Shoal (in the Main Channel) bears **N. $\frac{3}{4}$ W.**, distant nearly one mile.

If standing to the eastward on a wind you must beware of the black nun-buoy (No. 3) near the *seventeen and a half feet lump* (see page 560) and must give it a berth to the eastward of not less than a quarter of a mile. Also the perpendicularly-striped nun-buoy on the sailing-line of Gedney's Channel, and which is three-eighths of a mile to the northward of the seventeen and a half feet lump. A good rule to avoid these dangers, as well as the southern spit of Romer Shoal when coming in by the South Channel, is not to go to the northward of Princess Bay Light-house bearing **W. by N. $\frac{1}{4}$ N.**

When past False Hook Shoal you are fairly in the Main Channel, and the dangers met with are the same and are encountered in the same order as when passing through that channel. (See pages 561–563.)

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING NEW YORK BAY AND HARBOR.

III. Through the South Channel into the Main or Swash Channel.—From Sandy Hook Light-vessel steer **W. $\frac{3}{8}$ N.** until up with the Entrance Buoy (perpendicular stripes) of the South Channel. Here the depth will be a little over six fathoms and Scotland Light-vessel will bear **W. by S. $\frac{1}{2}$ S.**, distant seven-eighths of a mile. From this position Elm Tree Beacon will bear **NW. $\frac{1}{4}$ N.**, with New Dorp Beacon open a little to the northward of it; and that range will lead with not less than three and three-quarters fathoms through the Swash Channel and into the Main.

But, wishing to pass through the Main Channel, around Southwest Spit, when, on the **NW. $\frac{1}{4}$ N.** course towards Elm Tree Beacon, Bayside and Wilson's beacons come in range on a bearing of **W. by S. $\frac{1}{8}$ S.**, steer that course and follow the directions for the Main Channel on page 564.

Or, from Sandy Hook Light-vessel keep to the westward, steering about **W. by N. $\frac{3}{8}$ N.** for Sandy Hook Light-house, until Elm Tree and New Dorp beacons come in range on a bearing of **NW. $\frac{1}{2}$ N.** Northerly. On this course the least water will be four fathoms. When the range is on steer in on it, carrying not less than three and a half fathoms; and, if intending to enter the Main Channel, as soon as Bayside and Wilson's beacons come in range steer **W. by S. $\frac{1}{8}$ S.** (keeping the range) until past the Hook, and West Beacon and Sandy Hook Light-house are in range on a bearing of **SE. $\frac{1}{2}$ E.** Now steer **NW. $\frac{1}{2}$ W.** until Conover and Chapel Hill beacons are in range bearing **S. by W. $\frac{1}{4}$ W.**, when steer **N. by E. $\frac{1}{8}$ E.**, following the directions for the Main Channel.

But if, on the above courses, you intend to pass through the Swash Channel, when, on the course for Sandy Hook Light-house, Elm Tree Beacon bears **NW. $\frac{1}{4}$ N.** with New Dorp Beacon open a little to the northward of it, and Scotland Light-vessel bears **SW.**, a little over three-quarters of a mile distant, steer for Elm Tree Beacon, (keeping the relative positions of the two,) which course will lead with not less than twenty-two feet through the Swash Channel to its junction with the Main. This course does not pass near any of the shoals until it enters the Swash Channel. (See directions for that channel, pages 566–567.)

Or, a vessel of twelve feet draught or less may bring the Elm Tree and New Dorp beacons in range on a bearing of **NW. $\frac{1}{2}$ N.** Northerly and steer for them, (keeping the range,) which will lead through the Swash Channel with not less than sixteen feet at mean low water. This course passes over half a mile to the eastward of the black nun-buoy off the southeastern end of False Hook Shoal; about seven hundred yards to the eastward of the black spar-buoy (No. 3) off the southeastern spur of False Hook Shoal; five-eighths of a mile to the eastward of the main body of that shoal; the same distance to the eastward of the striped buoy on the northern end of that shoal; two hundred yards to the eastward of the striped buoy on Palestine Shoal, at the lower junction of the Main and Swash channels; the same distance to the westward of the black nun-buoy (No. 3) on the southernmost of the sixteen feet lumps in the Swash Channel; about one hundred and fifty yards to the eastward of the black nun-buoy (No. 5) on the eastern side of East Knolls; a little over three-eighths of a mile to the westward of the beacon on The Dry Romer; two hundred yards to the eastward of the striped buoy off the northern end of East Knolls; and six hundred yards to the westward of the red can-buoy (No. 8) on the western side of Romer Shoal.

Or, in a steamer or smart sailing vessel, NW. by W. $\frac{1}{2}$ W. may be steered from Sandy Hook Light-vessel, carrying not less than three and a quarter fathoms, crossing the South Channel obliquely, and entering the Main Channel abreast of the black buoy off the pitch of the Hook. This course can easily be made good on the flood tide; but with the ebb it will be necessary to keep more to the northward to avoid being set on False Hook Shoal or the shoals off the northern end of Sandy Hook, as the current of ebb sets directly upon these shoals and the sailing-line passes close to them. Pass to the northward of the black nun-buoy (No. 5 $\frac{1}{2}$) off the pitch of the Hook and continue the course until Bayside and Wilson's beacons are in range, when steer for them and follow the directions for the Main Channel.

This course passes four hundred yards to the northward of the striped buoy on the northern end of False Hook Shoal; a little over one hundred yards to the northward of the black nun-buoy on the eastern side of the northern end of Sandy Hook; and close to the black buoy off the pitch of the Hook.

DANGERS

IN APPROACHING AND ENTERING NEW YORK BAY AND HARBOR.

IV. By the False Hook Channel.—This is a good and safe channel for coasters during southerly or westerly winds,—having a depth of three and a half fathoms and being comparatively unobstructed throughout its entire length. It skirts the eastern shore of Sandy Hook, between it and False Hook Shoal, is straight, and in no place less than five hundred yards wide between the lines of three fathoms. With the wind off-shore and the consequent smooth sea it will be found a safe and convenient short cut from the southward into either the Main or Swash Channel. As, however, there are no good ranges throughout its length it should never be entered except on clear days, when the buoys can be seen and the distance from the beach rightly estimated.

The first danger met with in approaching this channel from the southward is known as Shrewsbury Rocks, and lies off the Jersey coast a little over one mile to the southward of the village of Seabright and three miles and three-eighths to the southward of Navesink Light-houses. These rocks are in reality a reef seven-eighths of a mile long **E NE.** and **W SW.**,—its eastern end being a mile from the beach with eighteen feet water. A spar-buoy painted red and black in horizontal stripes is placed on the shoalest part of the reef, in fourteen feet water, about three-quarters of a mile from the beach,—Highland Light-houses bearing **N. by W. $\frac{3}{4}$ W.** and Scotland Light-vessel **N. by E. Easterly**. There is an available channel, about five hundred yards wide and good for eighteen feet at mean low water, between the western end of this reef and the shore; but it is not recommended. The best plan for coasters in running up the beach is to keep not less than two miles from it until the Navesink Light-houses bear **NW. $\frac{1}{2}$ N.** Northerly and are in range; when they will be to the northward of Shrewsbury Rocks and may shape their course for the False Hook Channel.

**Shrewsbury
Rocks.**

About one mile to the northward of the Navesink Light-houses a shoal with from fourteen to eighteen feet upon it extends to the eastward for five-eighths of a mile,—its eastern end bearing from the light-houses **NE. $\frac{1}{4}$ E.**, one mile and three-eighths, and from Scotland Light-vessel **SW. by S. $\frac{1}{2}$ S.**, two miles and an eighth distant. Nearly three-eighths of a mile to the northward of this shoal is another spur making off from the beach for about the same distance and also having a depth of from fourteen to eighteen feet upon it. On its eastern extremity, in three fathoms water, is placed a black spar buoy, which serves as a guide to vessels for avoiding both the shoals. Between this buoy and the red buoy on the southern end of the Outer Middle Ground lies the entrance to the False Hook Channel, which is here five-eighths of a mile wide and has not less than eighteen and a half feet in it at mean low water.

When past the black buoy mentioned above, large vessels must look out for the Outer Middle Ground, which is on the eastern side of the channel, and consists of three separate sand shoals lying nearly **N.** and **S.** and having from seventeen to eighteen feet upon them. The two southernmost lie **E.** and **W.** from each other,—the easternmost bearing **SW.** from Scotland Light-vessel, distant one mile and an eighth, and the westernmost bearing **SW. $\frac{1}{4}$ W.** from the same light-vessel, distant one mile and a quarter. The northernmost shoal, which is an eighteen feet lump, is eight hundred yards to the northward of the two southern shoals, with a channel between them of not less than nineteen feet. It bears from Scotland Light-vessel **W. $\frac{1}{4}$ S.**, about one mile; from the Navesink Light-houses **NE. by N. $\frac{1}{4}$ N.**, a little over two miles and three-quarters; and from Sandy Hook Light-house **SE.**, about two miles and an eighth-distant. A red spar-buoy has been placed in three fathoms water on the southern edge of the southernmost shoal,—marking the eastern limits of the southern entrance to the channel.

**Outer Middle
Ground.**

When past the Outer Middle Ground you must look out for the southern end of False Hook Shoal, which is known as The Oil Spot and has from twelve to sixteen feet upon it. The film of oil

which covers the surface of the water sufficiently indicates the position of this shoal, which is the site of a sunken wreck which formerly existed in this position. The Oil Spot is about three-quarters of a mile wide **E. and W.**,—its western end being about three-eighths of a mile from the beach; and here, in three fathoms water, has been placed a red spar-buoy. False Hook Shoal extends from the northern end of The Oil Spot one mile and a quarter **NW. by N. $\frac{1}{4}$ N.** and has from fourteen to sixteen feet upon it. Its northern end, which is nearly opposite to Sandy Hook Point, is marked by a nun-buoy of the second class, painted red and black in horizontal stripes, and placed in three fathoms,—the Hook Beacon bearing **W. $\frac{1}{2}$ N.** Northerly three-quarters of a mile, and Sandy Hook Light-house **SW. $\frac{1}{4}$ W.** the same distance. From this buoy the three black buoys off the Hook are nearly in range on a bearing of **NW. $\frac{3}{4}$ W.**, and a striped buoy on Palestine Shoal (in the Main Channel) bears **N. $\frac{3}{4}$ W.**, distant nearly one mile. When up with it you must keep about three-eighths of a mile from the beach to go to the eastward of the black nun-buoy (No. 5) placed on the eastern edge of the shoals off Sandy Hook Point. To avoid these shoals you must not go to the westward of Elm Tree Beacon bearing **NW. by N.** Just to the westward of buoy No. 5 is placed a black spar-buoy (not numbered) which is also a guide for avoiding the shoals.

When past these two buoys the course must be continued to the northward until the range of Bayside and Wilson's beacons comes on, by which means the shoal off the pitch of the Hook will be avoided. This shoal is marked on its northern edge by a nun-buoy of the first class, painted black, marked No. 5 $\frac{1}{2}$, and placed in eighteen feet three-eighths of a mile **NNE.** from the Hook Beacon; also by the black spar-buoy, (above mentioned,) which is placed nearly midway between buoys Nos. 5 and 5 $\frac{1}{2}$. When past these you are in the Main Channel, and the dangers are the same and are met with in the same order as described on pages 561–563 under the Main Channel.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING NEW YORK BAY AND HARBOR.

IV. By the False Hook Channel.—When the Navesink Light-houses bear **W. by S.**, one mile and five-eighths distant, and Scotland Light-vessel **N. by E. $\frac{3}{4}$ E.**, a little over two miles and a quarter distant, the depth will be four and three-quarter fathoms and the course **N. by W. $\frac{3}{4}$ W.** (carrying not less than three and a half fathoms) for a little over three miles, or until the West Beacon is shut in behind Sandy Hook Light-house on a bearing of **NW. $\frac{1}{2}$ W.** Here the depth will be six fathoms and the course **N. by W. $\frac{1}{4}$ W.**, which will lead with not less than four fathoms out into the Main Channel and up to the range of Bayside and Wilson's beacons; after which the directions for the Main Channel must be followed.

The above courses pass three hundred yards to the westward of the southern end of the Outer Middle Ground; an eighth of a mile to the westward of the western end of The Oil Spot; three-eighths of a mile to the westward of the southern end of False Hook Shoal; three hundred yards to the westward of the striped buoy on the northern end of False Hook Shoal; and nearly four hundred yards to the eastward of the black nun-buoy (No. 5) marking the eastern edge of the shoals off Sandy Hook Point.

But, if intending to pass through the Swash Channel.—When on the **N. by W. $\frac{1}{4}$ W.** course Bayside and Wilson's beacons come in range on a bearing of **W. by S. $\frac{1}{8}$ S.** (as above) and the Hook Beacon bears **SW. $\frac{3}{4}$ S.**, steer **N. Westerly** for a little over one mile and an eighth, carrying not less than nineteen feet, until Elm Tree Beacon bears **NW. $\frac{1}{4}$ N.**, with New Dorp Beacon open a little to the northward of it. You are now in the Swash Channel and must steer **NW. $\frac{1}{4}$ N.**, which will lead safely into the Main Channel.

The course from the False Hook Channel into the Swash Channel passes a little over a quarter of a mile to the eastward of the red can-buoy off the eastern end of Flynn's Knoll; the same distance to the westward of the striped buoy on Palestine Shoal; and a quarter of a mile to the eastward of the black buoy (No. 3) on the lower sixteen feet lump.

DANGERS

IN APPROACHING AND ENTERING NEW YORK BAY AND HARBOR.

V. By the East Channel.—This channel is not safe for strangers and is rarely used. It lies between the Romer Shoal and the East Bank,—its general direction being about **NW. by W.** and its average width three-eighths of a mile, with a depth at mean low water of not less than three fathoms. Near its eastern entrance, however, the southeastern end of the East Bank and the eastern end of The Romer approach each other so closely as to contract the width of the channel to not more than one hundred yards. Although well buoyed this channel is very little used, as the ranges are distant and

uncertain and the water shoals rapidly on the northern side. The current of flood sets to the westward towards The Romer and that of ebb on to the East Bank; so that it is not considered safe for strangers, even if of light draught, to attempt to pass through. Small vessels, however, which have come along the southern coast of Long Island sometimes find it to their advantage to enter by this channel, and a description of the dangers and directions for avoiding them will therefore be in order.

The East Bank, which guards the northern side of this channel, is an extensive shoal, having from three to eighteen feet upon it, and covering an area four miles long **N NW.** and **S SE.** and from one and a half to two miles wide. It makes off from the western end of Coney Island, has three feet at mean low water one mile and a quarter from shore, six feet three miles from shore, and is crossed near its southern end by the slue known as the Fourteen Feet Channel. *East Bank.* Off its southeastern end is a sixteen feet knoll, marked by a red spar-buoy (No. 2) placed on its southern side and known as the "Northern Entrance Buoy" to the East Channel. The black spar-buoy (No. 1) seen about three-eighths of a mile to the southward of it is off the eastern end of Romer Shoal and is called the "Southern Entrance Buoy." The channel passes between them with four and a quarter fathoms.

The Northern Entrance Buoy bears from the Whistling Buoy **NW.** by **N.** $\frac{1}{2}$ **N.**, distant nearly one mile and a half, and from Sandy Hook Light-vessel **NW.** $\frac{1}{4}$ **N.**, distant five miles. From the buoy Sandy Hook Light-house bears **SW.** $\frac{1}{2}$ **W.** Westerly, distant three miles and seven-eighths; The Lump Buoy of the East Channel (red and black) **NW.** by **W.** $\frac{3}{8}$ **W.**, distant three-quarters of a mile; and the black spar-buoy (No. 3) on the northern side of Romer Shoal **W.** by **N.**, distant one mile and three-eighths.

The Southern Entrance Buoy (which is on The Romer, already described on page 560) bears from the Whistling Buoy **NW.** $\frac{3}{4}$ **N.**, distant one mile and a quarter, and from Sandy Hook Light-vessel **NW.** $\frac{1}{4}$ **N.**, distant four miles and three-quarters. From this buoy The Lump Buoy bears **NW.** $\frac{3}{4}$ **N.**, distant seven-eighths of a mile, and the black buoy (No. 3) on the northern side of Romer Shoal **NW.** by **W.** $\frac{3}{4}$ **W.**, distant one mile and three-eighths.

"The Lump Buoy" is a spar of the first class, painted red and black in horizontal stripes, and placed on a spur of the southeastern end of East Bank about three-quarters of a mile to the westward of the Northern Entrance Buoy. Here the channel is very narrow owing to the spits of The Romer and East Bank coming together; and it is only possible to carry more than eighteen feet by passing close to the buoy on its southern side. When up with it the black spar-buoy (No. 3) on the northern side of The Romer will be seen, bearing **W.** $\frac{1}{2}$ **S.** and three-quarters of a mile off. This is near a ten feet spot near the eastern end of the main body of Romer Shoal and is placed in eighteen feet water,—Elm Tree Beacon bearing **NW.** $\frac{3}{4}$ **W.**, the stone beacon on The Dry *The Lump.*

Romer **W.** by **N.** $\frac{1}{4}$ **N.**, and the black buoy (No. 5) on the northern side of Romer Shoal **NW.** by **W.** $\frac{5}{8}$ **W.**,—the latter being distant one mile. This latter buoy is a spar, placed in eighteen feet seven-eighths of a mile **E. Northerly** from the beacon on The Dry Romer, and marks the western limits of the East Channel. Elm Tree Beacon bears from it **NW.** $\frac{1}{2}$ **W.**; Fort Tompkins Light-house **N.** by **W.** $\frac{3}{4}$ **W.**; the red spar-buoy (No. 4) on the southern side of East Bank **N NW. Northerly**; the red spar-buoy (No. 6) on the southwestern end of East Bank **NW.** by **N.** $\frac{3}{8}$ **N.**; and the red can-buoy (No. 14) on the northwestern end of Romer Shoal **NW.**;—the last named being distant two and a quarter miles and at the point of junction of this channel with the Main Channel.

When up with black buoy No. 5 the red spar-buoy (No. 4) will appear, bearing about **N NW.** and three-quarters of a mile off. This buoy marks the western end of the Southern Spit of East Bank and is placed in six fathoms close to an eleven feet spot. The bank is abrupt here and great care is necessary to avoid it on the ebb tide. From this buoy the red buoy *Southern Spit of East Bank.* (No. 6) on the southwestern end of East Bank bears **NW.** by **N.**, distant a little over one mile; the red can-buoy (No. 14) on the northwestern end of Romer Shoal **NW.** by **W.**, distant one mile and five-eighths; and the stone beacon on The Dry Romer **SW.** $\frac{1}{2}$ **S.**, distant one mile. The last named must receive a berth to the westward of not less than three-quarters of a mile,—especially on the flood tide, which sets directly on The Romer.

The red spar-buoy (No. 6) marks the point of junction with the Main Channel of both the East and Fourteen Feet channels. It is placed in four fathoms off the southwestern end of East Bank,—Fort Tompkins Light-house bearing **N.** by **W.** $\frac{1}{2}$ **W.** and Gravesend Point (the western end of Coney Island) **N.** by **E.** $\frac{1}{4}$ **E.** Opposite to it, on the western side of the channel, and bearing nearly due **W.**, is the red can-buoy (No. 14) on the northwestern end of Romer Shoal; and here the channel is five-eighths of a mile wide with from four to five fathoms at low water. When past these two buoys you are in the Main Channel, and the dangers are the same and are met with in the same order as described on pages 562-563.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING NEW YORK BAY AND HARBOR.

V. *By the East Channel.*—Bring Sandy Hook Light-house to bear **W.** by **S.** $\frac{1}{2}$ **S.** and the Navesink Light-houses **SW.** $\frac{1}{4}$ **S.**, when the depth will be six and a half fathoms and the course thence

Sailing Direc- for the entrance to the East Channel $\text{NW. } \frac{1}{4} \text{ W.}$, which will lead safely with not less **tions---East** than three and a half fathoms midway between the red spar-buoy (No. 2) and the black **Channel.** spar-buoy (No. 1) which mark the entrance. Continue this course, carrying not less than three fathoms, until up with The Lump Buoy, which pass close-to on its southern side; and when Sandy Hook Light-house bears $\text{SW. } \frac{1}{2} \text{ S.}$ steer $\text{NW. by W. } \frac{1}{8} \text{ W.}$ for a little over two miles, carrying not less than twenty-three feet. On this course, when the beacon on The Dry Romer bears SW. Westerly , distant three-quarters of a mile, Sandy Hook Light-house $\text{S. } \frac{1}{2} \text{ W.}$, distant three miles and a half, and Elm Tree Beacon $\text{NW. } \frac{1}{4} \text{ W.}$, distant four miles and seven-eighths, steer $\text{NW. } \frac{1}{4} \text{ N.}$, carrying not less than four fathoms, which course will bring you safely into the Main Channel. On this course, when Conover and Chapel Hill beacons are in range on a bearing of $\text{S. by W. } \frac{1}{2} \text{ W.}$, steer $\text{N. by E. } \frac{1}{4} \text{ E.}$ and follow the directions for the Main Channel on page 564.

The above courses pass three hundred yards to the southward of the Northern Entrance Buoy; four hundred yards to the northward of the Southern Entrance Buoy; about fifty yards to the southwestward of The Lump Buoy; a little over six hundred yards to the northward of the black spar-buoy (No. 3) on the northern side of Romer Shoal; a little over a quarter of a mile to the northward of the black spar-buoy (No. 5) on the northern side of Romer Shoal; three hundred and fifty yards to the southward and westward of the red spar-buoy (No. 4) on the western end of the Southern Spit of East Bank; three-quarters of a mile to the northeastward of the stone beacon on The Dry Romer; six hundred yards to the westward of the red buoy (No. 6) off the southwestern end of East Bank; and a quarter of a mile to the northeastward of the red can-buoy (No. 14) on the northwestern end of Romer Shoal.

DANGERS

IN APPROACHING AND ENTERING NEW YORK BAY AND HARBOR.

VI. By the Fourteen Feet Channel.—This channel, previously referred to on page 571 as crossing the East Bank near its southern end, is used only by small craft whose masters are fully acquainted with all of its dangers and should never be attempted by strangers. As its name indicates, it is good for but fourteen feet at mean low water, but this depth is found only at its eastern entrance, across a narrow ridge of the East Bank; after passing which not less than eighteen feet may be carried through into the Main Channel of New York Bay. The channel is narrow and winding in its course; both the flood and ebb currents set obliquely across it; and it is, therefore, not recommended. But inasmuch as the approaches to New York Bay and Harbor would not be complete without some mention of this channel, a general description of its dangers, together with sailing directions, will be given.

Vessels coming from the eastward along the southern coast of Long Island and intending to make the entrance to this channel must beware of the extensive shoals making off to the southward from Rockaway Beach and Barren Island,—the latter forming, respectively, the eastern and western points of entrance to Rockaway Inlet. These shoals, called Rockaway Shoals, extend off to a distance of nearly two miles and are very abrupt,—the depth diminishing in some places from six fathoms to five feet within two hundred yards. A good rule is not to stand into less than six fathoms, or, if the light can be seen, not to go to the northward of Elm Tree Beacon bearing $\text{W. by N. } \frac{1}{4} \text{ N.}$ until you are to the westward of Sandy Hook Light-vessel bearing SE. ; after which you may go within three-quarters of a mile of the beach with safety until up with the black spar-buoy at the entrance to the channel.

Vessels endeavoring to enter New York Harbor by the Fourteen Feet Channel should, when past Rockaway Shoals and in the vicinity of the entrance, bring Elm Tree Beacon to bear about WNW. and steer for it. This will bring them up with the black spar-buoy (No. 1) on the northeastern end of the Southern Spit of East Bank, which latter forms the southern boundary of the channel. This portion of the East Bank is connected with the main body of the shoal (to the northwestward) by a narrow area of shoal ground across which only fourteen feet at mean low water may be carried. The buoy is placed in seventeen feet water on the western edge of this shoal ground, and vessels should round it close-to,—passing to the northward of it. The belt of shoal water between the lines of three fathoms which is crossed by vessels using this channel is only about seven hundred yards wide; after passing which not less than eighteen feet will be found by following the sailing-lines.

When past the black buoy at the entrance the course turns more to the southward and there will be seen ahead, nearly in range with each other, two spar-buoys,—the nearest being painted red while the one farthest to the westward is black. The red buoy is on the southern side of the main part of East Bank and marks the northern limits of the channel. It is placed on the edge of the eighteen feet curve, is marked No. 2, and bears from the

black buoy (No. 1) at the entrance **W.** by **S. $\frac{1}{8}$ S.**, distant one mile and an eighth. The East Bank is an extensive shoal making off to the southward from the western end of Coney Island, has from three to eighteen feet upon it, and covers an area four miles long **N NW.** and **S SE.** and from one and a half to two miles wide. The red buoy above mentioned lies just to the southward of a nine feet spot, and vessels must be careful at this point to avoid being set on to the bank.

The black buoy seen ahead, when abreast of the red buoy No. 2, is on the northern side of the Southern Spit of East Bank (before mentioned) and is to be left to the southward,—giving it a berth of about two hundred yards. It is marked No. 3 and bears from the red buoy on the northern side of the channel **W.** by **S. $\frac{1}{8}$ S.**, distant a little over half a mile. When abreast of this buoy the course leads to the northwestward,—heading exactly for the Lower Quarantine Station on Dix Island. On this course you will soon perceive ahead two red spar-buoys,—one on each side of the channel. The sailing-line passes exactly midway between the two, and the fact that the southernmost buoy is painted red must not be permitted to confuse the navigator, as it is a mark for the East Channel,—being placed on the northwestern end of the Southern Spit of East Bank. It is marked No. 6 and is placed in four fathoms water,—bearing from the black buoy (No. 3) **NW. $\frac{1}{4}$ W.**, distant seven-eighths of a mile. Vessels should not go to the southward of a line between these two buoys.

The red buoy on the northern side of the channel is placed in eighteen feet, on the southwestern edge of the main body of East Bank, close to a ten feet spot, is marked No. 4, and may be rounded at a distance of fifty yards with safety,—the four fathoms curve passing close to it. When past it you are in the Main Channel, and the dangers are the same and are met with in the same order as those described on pages 562–563.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING NEW YORK BAY AND HARBOR.

VI. By the Fourteen Feet Channel.—Bring Sandy Hook Light-house to bear **SW.** by **W. $\frac{3}{4}$ W.**, Sandy Hook Light-vessel **S.**, and Elm Tree Beacon **W.** by **N. $\frac{1}{8}$ N.**, when you will have about six and a quarter fathoms and must steer for the beacon, which will lead you up to the black spar-buoy (No. 1) at the entrance. On this course you will cross the narrow area of shoal water (before described) with not less than fourteen and a half feet; and when up with the buoy pass to the northward of it, close-to, and steer **W.** by **S. $\frac{1}{8}$ S.**, carrying not less than eighteen feet. Continue this course until you are abreast of the red spar-buoy (No. 2) on the southern edge of the East Bank, when give it a berth to the northward of about two hundred yards and steer **W.** by **N. $\frac{1}{4}$ N.** for nearly half a mile, or until you come abreast of the black buoy (No. 3). Pass to the northward of this buoy at a distance of between two and three hundred yards and steer **NW. $\frac{3}{8}$ N.**, heading exactly for the Lower Quarantine Station on Dix Island and carrying not less than twenty-two and a half feet water. When exactly between the two red buoys (Nos. 4 and 6), with Elm Tree Beacon bearing **NW.** by **W. $\frac{3}{4}$ W.** and Sandy Hook Light-house **S.**, steer **N.** by **W.** for Robbins' Reef Light-house and follow the directions given for the Main Channel on page 564.

The above courses pass one mile to the southward of Rockaway Shoals; close-to to the northward of the black spar-buoy (No. 1) at the entrance to the channel; about one hundred and fifty yards to the southward of the red spar-buoy (No. 2) on the southern side of East Bank; two hundred and fifty yards to the northward of black buoy No. 3; and four hundred yards to the southward and three hundred yards to the westward of the red spar-buoy (No. 4) on the southwestern edge of the main portion of East Bank.

As before remarked, it is not considered advisable for strangers to attempt to pass through this channel.

GENERAL REMARKS

ON THE APPROACHES TO NEW YORK BAY AND HARBOR FROM SEA.

The Gulf Stream first warns vessels approaching New York from the southeastward by its high temperature,—say from 70° to 75° Fahr., between the Latitudes of 36° and 39° N.,—the water outside of the Stream being about 51° Fahr. in the summer time. The distance from Sandy Hook in a southeasterly direction to the outer edge of the Gulf Stream is about four hundred and thirty miles and to its inner edge two hundred and forty miles. On striking soundings after crossing the Stream—say in from seventy-five to one hundred fathoms—a slight diminution of temperature will be perceived, and the water will change in color from a dark to a light blue. Depth is a better indication of position off this part of the coast than the character of the bottom, as the same characteristics may be found in widely different positions with the same depth; while the judicious use of the lead will always give sufficient warning of danger.

To the above means of ascertaining the vessel's position with reference to the coast are to be added several peculiarities in the character of the approaches,—among them certain remarkable irregularities of depth. These are,

First. The Five Fathom Bank, off Delaware Bay, with thirteen feet upon it, and lying about fifteen miles E. by S. $\frac{1}{4}$ S. from Cape May. A light-vessel is moored in about twelve fathoms nearly four miles and a half S. $\frac{3}{4}$ E. from the eastern end of this bank and is nearly always run for by coasting-vessels from the southward bound to New York. There is also a nun-buoy of the first class, painted black, and placed in three fathoms-off the eastern end of the **Five Fathom Bank and Light-vessel.** The light-vessel is known as Five Fathom Bank Light-vessel, is schooner-rigged, the hull painted straw color, and has a hoop-iron day-mark painted red at each masthead. The words "Five Fathom Bank" are painted in large black letters on each side of the hull and "No. 40" on each quarter. Two fixed white lights are shown from this vessel from a height respectively of forty and forty-five feet above the sea, visible nearly twelve miles; and in thick weather a twelve-inch steam fog-whistle is sounded, giving a blast of four seconds during each minute.

The approximate geographical position of Five Fathom Bank Light-vessel is

Latitude ----- 38° 48' 15'' N.
Longitude ----- 74° 35' 45'' W.,

and from it

	Miles.
Cape May Light-house bears NW. by W. $\frac{3}{4}$ W.-----	18 $\frac{3}{4}$
The black nun-buoy off Five Fathom Bank N. $\frac{1}{4}$ W.-----	a little over 5 $\frac{1}{2}$
Absecon Light-house N. by E. $\frac{3}{4}$ E.-----	35
Barnegat Light-house NE. by N. $\frac{3}{4}$ N.-----	nearly 63
Fire Island Light-house NE. by N.-----	127 $\frac{1}{2}$

There is a shoal spot with three and a half fathoms three miles and an eighth NW. $\frac{1}{4}$ N. from the light-vessel. It is marked by a red nun-buoy of the second class, placed in four fathoms on its southern edge. This shoal is locally known as the *Twenty-one Feet Shoal* and is said to break heavily in stormy weather.

About ten miles and a quarter NNE. from Five Fathom Bank Light-vessel, in nine fathoms water, is placed the "Whistling Buoy" for the guidance of vessels bound to Delaware Bay from the northward. It is sounded by the motion of the sea and is painted red, and vessels of heavy draught should always pass to the eastward of it. Well to the eastward of the Whistling Buoy, bearing from it E. by S. $\frac{3}{4}$ S., distant ten miles and a half, and in about eighteen fathoms water, lies a sunken wreck, which is supposed to be that of the steamer "Champion." The position of the wreck is marked by a second class can-buoy painted red and black in horizontal stripes, and bearing from Five Fathom Bank Light-vessel NE. by E. $\frac{3}{4}$ E., distant fourteen miles and an eighth.

Second. The Mud Holes. There are several remarkable depressions of the bottom extending in a southeasterly direction from Sandy Hook, which have the appearance of having originally been a continuation seaward of the Hudson River valley. The positions of the several **The Mud Holes.** "holes" being well determined, afford an excellent indication to the mariner of his distance from the coast and the direction of the entrance. Of these mud holes there are nine known to navigators, viz: The "Twenty-one Fathom," the "Twenty-three Fathom," the "Twenty-eight Fathom," the *two* "Thirty-two Fathom," the *two* "Thirty-seven Fathom," the "Thirty-five Fathom," the "Thirty-eight Fathom," the "Fifty Fathom," and the "One Hundred and Forty-five Fathom" holes. A brief description of each will suffice.

1. The One Hundred and Forty-five Fathom Hole is in Latitude 39° 38' N. and Longitude 72° 24' 20'' W.,—Sandy Hook Light-vessel bearing NW. $\frac{1}{4}$ W., eighty-three miles, and Navesink Light-houses NW. $\frac{1}{4}$ W., eighty-six miles distant. It covers an area about three-quarters of a mile in diameter, with one hundred and forty fathoms close to its eastern edge, and to the eastward sixty, sixty-five and seventy-five fathoms,—the depth gradually increasing in that direction to eighty fathoms, and then dropping suddenly into one hundred and one hundred and thirteen fathoms. The bottom of this Hole is mostly blue mud, green mud and green ooze. At the one hundred and forty fathoms there is "blue mud and fine shells," and on the southern edge of the Hole "gravel, mud and sand." To the westward the bottom rises abruptly to sixty-three fathoms and then slopes upward regularly to fifty fathoms—"grey sand and black specks."

2. The Fifty Fathom Hole is in Latitude 40° N. and Longitude 72° 29' 30'' W.,—Sandy Hook Light-vessel bearing NW. by W. $\frac{1}{4}$ W., nearly sixty-eight miles, and Navesink Light-houses NW. by W. $\frac{3}{4}$ W., nearly seventy-two miles distant. It covers an area of about half a mile square; and the irregularities of depth in the approaches to it are not so remarkable as those near the One Hundred and Forty-five Fathom Hole, but sufficiently marked to afford an approximate indication of position. On approaching the Hole from the eastward the

soundings vary from forty to thirty-two fathoms,—the character of the bottom changing rapidly from “green ooze and sand,” in forty fathoms, to “grey sand, black specks and shells,” in thirty-five fathoms, with nearly every possible variation of “sand, mud and shells” between the two, except that there are no pebbles. Approaching from the southward, the soundings vary between thirty-six and forty-five fathoms, “grey sand and black specks;” and crossing to the westward of the Hole they diminish gradually to thirty fathoms, “grey and yellow sand.”

3. The Thirty-five Fathom Hole extends nearly **E.** and **W.** for between four and five miles. Its western edge is in Latitude $39^{\circ} 39' 17''$ N. and Longitude $73^{\circ} 11' 40''$ W.,—Sandy Hook Light-vessel bearing **NW.** by **N.** $\frac{1}{4}$ **N.**, nearly fifty-eight miles, and Navesink Light-houses **NW.** $\frac{3}{8}$ **N.**, a little over fifty-nine miles distant. Its eastern edge is in Latitude $39^{\circ} 40' 43''$ N. and Longitude $73^{\circ} 6'$ W.,—Sandy Hook Light-vessel bearing **NW.** by **N.** $\frac{3}{8}$ **N.**, nearly fifty-seven miles, and Navesink Light-houses **NW.** by **N.** $\frac{1}{8}$ **N.**, nearly fifty-eight miles distant. Thirty fathoms is found between four and five miles to the eastward of the Hole,—the bottom being grey sand, black and yellow specks. Thence to the westward the soundings gradually diminish to twenty-*Thirty-five Fathom Hole.* seven fathoms, “grey sand and yellow specks,” and then increase to thirty-five fathoms on the eastern edge of the Hole. From its western edge the depth diminishes with the same regularity to twenty fathoms, “grey sand and black specks,” which is found between three and four miles to the westward. If this Hole is approached from the southward or southeastward, thirty fathoms is found ten miles **SE.** by **S.** from its western edge, and then the depth gradually diminishes to twenty-seven fathoms, “grey sand and pebbles,” on the southern edge of the Hole, in which thirty-five fathoms, “black mud,” is found. On crossing the northern edge there is twenty-six fathoms, “coarse grey sand and pebbles;” and thence towards Sandy Hook a very regular gradual diminution of depth until the First Thirty-seven Fathom Hole is reached.

4. The Thirty-eight Fathom Hole lies about **NNW.** and **SSE.** and is nearly six miles long. Its southern edge is in Latitude $39^{\circ} 53' 20''$ N., Longitude $73^{\circ} 7'$ W.,—Sandy Hook Light-vessel bearing **NW.** $\frac{1}{2}$ **N.**, a little over forty-seven miles, and Navesink Light-houses **NW.**, forty-nine and a half miles distant. Its northern edge is in Latitude $39^{\circ} 58' 20''$ N., Longitude $73^{\circ} 11' 30''$ W.,—Sandy Hook Light-vessel bearing **NW.** $\frac{1}{4}$ **N.**, distant forty-two miles, and Navesink Light-houses **NW.** $\frac{1}{4}$ **W.**, distant forty-four miles. The irregularities of bottom in its approaches are quite remarkable,—especially on its eastern side, where thirty fathoms is found (in Longitude $72^{\circ} 48'$ W.) between fifteen and sixteen miles from the Hole. From this position the water shoals gradually to twenty-eight fathoms, “grey and yellow sand,” near the eastern edge; and then, if *Thirty-eight Fathom Hole.* near the southern end of the Hole, the depth increases to thirty-five fathoms, “grey sand and mud,” followed by thirty-eight fathoms, “dark grey sand and mud.” Having crossed the Hole the depth decreases with great regularity, and twenty fathoms is found sixteen miles to the westward. Approaching from the southward the soundings decrease to thirty fathoms, in Latitude $39^{\circ} 42'$ N., twelve miles south of the southern edge of the Hole; and to the northward of this they vary from twenty-six to twenty-nine fathoms, “grey sand.” Thence to the northward the depth increases regularly to thirty-five fathoms, “grey sand and yellow specks,” which is found close to the southern edge. Crossing to the northward of the Hole, twenty-seven fathoms is found within three miles of its northern edge; after which the depth diminishes regularly as the entrance to the bay is approached.

5. The Second Thirty-seven Fathom Hole extends nearly **E.** and **W.** between two and three miles. Its eastern edge is in Latitude 40° N., Longitude $73^{\circ} 22' 30''$ W.,—Sandy Hook Light-vessel bearing **NW.** by **N.** $\frac{3}{8}$ **N.**, distant thirty-four and a half miles, and Navesink Light-houses **NW.** $\frac{1}{4}$ **N.**, distant thirty-six and a quarter miles. Its western edge is in Latitude $39^{\circ} 59' 10''$ N., Longitude $73^{\circ} 25'$ W.,—Sandy Hook Light-vessel bearing **NW.** by **N.** $\frac{1}{2}$ **N.**, thirty-four miles, and Navesink Light-houses **NW.** $\frac{1}{2}$ **N.**, thirty-five and a quarter miles distant. *Second Thirty-seven Fathom Hole.* Its southern approaches are particularly well marked,—showing as low as twenty-one fathoms two miles from the southern edge of the Hole. When approached from the eastward, thirty fathoms is found twenty-six miles from the Hole, and thence to the westward the depths vary from twenty-nine to twenty-four fathoms, mostly “grey sand and black and yellow specks,” until the eastern edge is reached. Here is found thirty-seven fathoms, “dark grey sand and mud.” To the northward and westward of the Hole the depth diminishes with greater rapidity,—twenty fathoms being found five miles **W.** of the western edge and seven miles **NE.** of it, (near the southern edge of the First Thirty-seven Fathom Hole.)

6. The First Thirty-seven Fathom Hole extends **NNW.** and **SSE.** between two and three miles, with a bottom of black mud. Its centre is in Latitude $40^{\circ} 7'$ N. and Longitude $73^{\circ} 34' 30''$ W.; while from its northern end Sandy Hook Light-vessel bears **NW.** by **N.** $\frac{3}{4}$ **N.**, twenty-two miles, and Navesink Light-houses **NW.** $\frac{1}{4}$ **N.**, twenty-three miles and three-quarters distant. From its southern end Sandy Hook Light-vessel has the same bearing as from the northern end, but is distant twenty-five miles; and Navesink Light-houses bear **NW.** $\frac{3}{8}$ **N.**, twenty-six miles distant. Twenty fathoms is found within half a mile of the southern edge, in a **S.** $\frac{1}{2}$ **W.** direction,—the bottom being grey sand; nineteen *First Thirty-seven Fathom Hole.*

fathoms within one mile **SE.** by **E. $\frac{1}{2}$ E.** of the same edge; and between those two depths thirty-four fathoms will be found close to the Hole. Having crossed the Hole to the northward the depth will diminish gradually, and twenty fathoms will be found within three miles and a half of the northern edge,—the bottom being grey sand and black specks with a slight mixture of gravel. This is “*The Mowl Hole*” commonly known to navigators.

7. The Thirty-two Fathom Hole is in Latitude $40^{\circ} 15' N.$, Longitude $73^{\circ} 45' W.$ From its eastern edge Sandy Hook Light-vessel bears **N.** by **W. $\frac{1}{2}$ W.**, thirteen miles, and Navesink Light-houses **NW.**, fourteen miles distant; while from its western edge the light-vessel bears **N.** by **W. $\frac{1}{4}$ W.**, distant twelve miles, and Navesink Light-houses **NW. $\frac{3}{4}$ W.**, distant twelve miles and two-thirds. Although of less importance than those before described, this Hole merits more than a mere reference; as from its position relative to a very dangerous part of the Jersey coast, and also to the line of twenty fathoms, (which here leads in the direction of the light-vessel,) it is an excellent indication of the distance from the beach. The Hole is about one mile and three-quarters long **NW.** and **SE.**, with very marked irregularities of bottom on all sides. Fifteen fathoms is found one mile and a

Thirty-two Fathom Hole.

half to the eastward, and seventeen fathoms one mile **NE.** from its eastern edge,—the bottom being grey and yellow sand mixed with broken shells. Approaching from the southward, twenty fathoms is found three and a half miles **SE.** from its southern edge, Sandy Hook Light-vessel bearing **N.** by **W. $\frac{3}{4}$ W.**, distant about seventeen miles,—and the depth will diminish gradually to eighteen fathoms, “grey sand and pebbles,” between one and two miles from the Hole, and will then increase to twenty-three fathoms close to the eastern edge. To the westward sixteen fathoms is found within less than one mile of the western edge; and thence the depth gradually decreases to the Jersey beach, which is not quite ten miles from the Hole. To the northward we find twenty fathoms close to the northern edge,—diminishing in the direction of the Highlands to fifteen fathoms within the first two miles, and then suddenly deepening to twenty-nine fathoms on the southern edge of what is known as the Twenty-eight Fathom Hole.

8. The Inner Thirty-two Fathom Hole and the Twenty-eight Fathom Hole, though not so well known to navigators, are of sufficient importance to merit notice in this place. The former is very

small,—being only about half a mile in diameter,—and bears from Sandy Hook **Inner Thirty-two Fathom and Twenty-eight Fathom Holes.** Light-vessel **S.** by **E. $\frac{1}{2}$ E.**, nine miles, and from Navesink Light-houses **SE. $\frac{3}{4}$ E.**, eleven miles distant. Just to the westward of it is the Twenty-eight Fathom Hole, with from twenty-six to twenty-nine fathoms, extending **NNE.** and **SSW.** for one mile and quarter. Fifteen fathoms is found close to its northern, southern and western edges. The northern edge of the Hole bears from Sandy Hook Light-vessel **S.** by **E. $\frac{1}{2}$ E.**, eight miles and a half, and from Navesink Light-houses **SE. $\frac{3}{4}$ E.**, ten miles

distant. The southern edge bears from the light-vessel **S. $\frac{3}{4}$ E.**, nine miles and a half, and from Navesink Light-houses **SE. $\frac{1}{4}$ E.**, ten miles and a half distant. The Hole is nearly eight miles from the Jersey shore.

9. The Twenty-one Fathom Hole is about half a mile in diameter, and bears from Sandy Hook **Twenty-one Fathom Hole.** Light-vessel **S.** by **E. $\frac{3}{4}$ E.**, seven miles and two-thirds, and from Navesink Light-houses **SE.** by **E. $\frac{3}{4}$ E.**, ten miles distant. The bottom is mud. Thirteen fathoms is found three-quarters of a mile to the eastward; twelve fathoms one mile to the northward; and the Inner Thirty-two Fathom Hole is a little over a mile to the southward. The nearest part of the Jersey beach is distant eight miles and a half.

10. The Twenty-three Fathom Hole, which was first sounded upon by Edmund Blunt, Esq., in 1825, has soundings over it varying from twenty-one to twenty-three fathoms, mostly “mud.” It lies two miles to the northward of the Twenty-one Fathom Hole,—its **Twenty-three Fathom Hole.** centre bearing from Sandy Hook Light-vessel **SE.** by **S. $\frac{1}{4}$ S.**, five miles and a half, and from Navesink Light-houses **E.** by **S. $\frac{1}{2}$ S.**, nine miles and a quarter distant. It covers an area one mile and a half square, with soundings of from fifteen to eighteen fathoms, “dark grey sand,” on all sides of it.

Third. Cholera Bank. This bank, although a comparatively short distance from Sandy Hook Light-vessel and but little elevated above the surrounding bottom, serves by the characteristic soundings (which show rocky bottom) to indicate the navigator's position. It extends about **E.** by **S. $\frac{1}{2}$ S.** and **W.** by **N. $\frac{1}{2}$ N.** for between five and six miles, with a depth of from ten to eleven

Cholera Bank. fathoms and an average width **N.** and **S.** of one mile and three-quarters. Its southern end bears from Sandy Hook Light-vessel **E.** by **S. $\frac{1}{2}$ S.**, eighteen miles, and from Navesink Light-houses **E. $\frac{3}{4}$ S.**, between twenty-three and twenty-four miles distant. Its northeastern end bears from Sandy Hook Light-vessel **E.** by **S. $\frac{1}{4}$ S.**, seventeen miles, and from Navesink Light-houses **E. $\frac{3}{4}$ S.**, twenty-three miles distant. Its western end bears from the light-vessel **E.** by **S. $\frac{1}{2}$ S.**, thirteen miles, and from Navesink Light-houses **E. $\frac{1}{2}$ S.**, nineteen miles distant.

Fourth. The Twenty Fathom Line off the Jersey coast. A peculiar gorge, formed by the twenty fathom curve off the New Jersey coast to the southward of New York Entrance, and which embraces within its limits the two Thirty-two Fathom, the Twenty-eight Fathom, the Twenty-one Fathom and the Twenty-three Fathom holes, also serves as a guide to vessels approaching from the southward in

74°00'

73°30'

73°00'



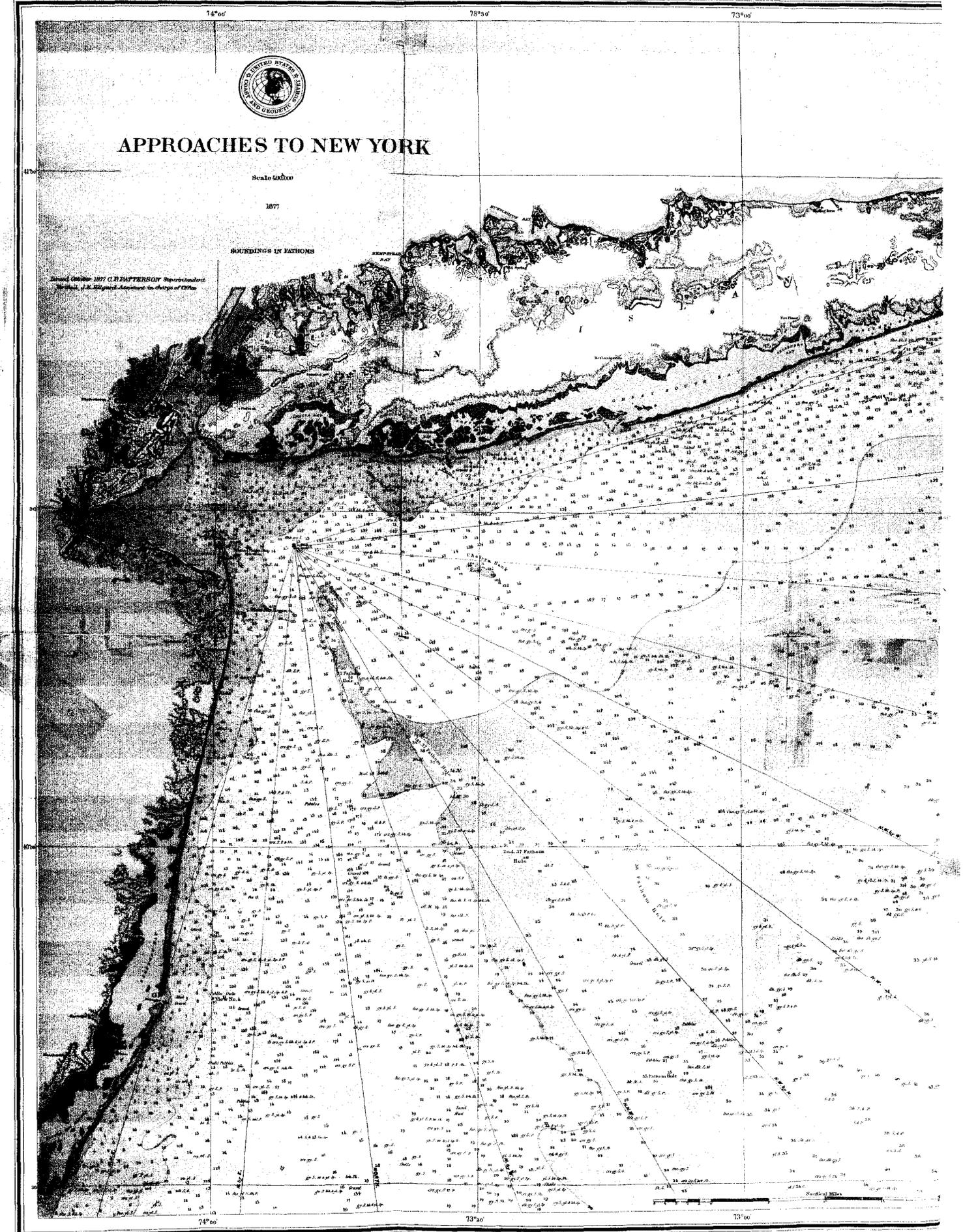
APPROACHES TO NEW YORK

Scale 60000

1877

SOUNDINGS IN FATHOMS

Soundings 1877 C.H. PATTERSON Superintendent
The U.S. Hydrographic Service in charge of Office



74°00'

73°30'

73°00'

thick weather. After following the coast of Long Island to the westward and the Jersey coast to the northward the two parts of this twenty fathom line approach each other in Latitude $40^{\circ} 10' N.$, Longitude $73^{\circ} 40' W.$, about nineteen miles **S. by E. $\frac{3}{4}$ E.** from the light-vessel. Here they are only about two miles apart; and from this position a sort of gorge with an average width of about one mile and a half extends **N. by W.** for fifteen miles, or to within about five miles of the light-vessel. Thus, if a vessel from the southward striking twenty fathoms to the northward of Barnegat steers about **N. by W. $\frac{1}{4}$ W.**, she will be apt to keep in not less than twenty fathoms and will be on a safe course for the light-vessel. Such course will be apt, also, to strike the Thirty-two, the Twenty-one and the Twenty-three Fathom holes, which will serve as indications of position. Inasmuch as the wind current—owing to the prevailing northeasterly winds—sets to the westward towards the Jersey coast it will be well, should less than twenty fathoms be obtained on the above course, to haul to the eastward until the water deepens, and then proceed again on the course; repeating the operation if necessary until to the northward of the Twenty-three Fathom Hole, when you may steer **NNW.** until the fog-signal on the Light-vessel or the shriek of the Whistling Buoy is heard.

Twenty Fathom Line.

Fifth. The relation to each other of the soundings on the Long Island and New Jersey coasts. Among the irregularities of bottom which serve as indications of a vessel's position when approaching New York Entrance may be mentioned the soundings off the coasts of Long Island and New Jersey. The water shoals very gradually going to the westward towards the latter coast, and very rapidly if standing to the northward towards Long Island. From the peculiar position, also, of the two shores relatively to each other and to the waters of New York Bay it follows that the course which will deepen the water, if the vessel is on the Long Island side of the approach, will shoal it if she is on the New Jersey coast. This is very important in thick weather. The following rule based upon the above fact is safe and reliable: Striking fifteen fathoms and in doubt as to position, steer **SW.** by **S.** If the water deepens the vessel is on the Long Island shore; if it shoals gradually she is on the Jersey coast. In the former case you may stand off and on, taking care *not* to go inside of twelve fathoms, and so work up towards the light-vessel. In the latter case the ship's head must at once be put off shore, (as nearly **E. by S.** as possible,) and you should stand off in that direction until the soundings give twenty fathoms, which is at a safe distance from land. A stranger finding himself on the Jersey coast in thick weather should not attempt to run in towards the light-vessel, but should keep off shore until the weather clears up.

Soundings on Long Island and Jersey Coasts.

In this connection it may be remarked that there is said to be, about five miles **E SE.** from Sandy Hook Light-vessel, a spot with nine fathoms upon it, reported by one of the Sandy Hook pilots.

There are twenty-nine pilot boats which cruise off shore between Nantucket and Cape May,—each having her distinguishing number on her sails. The New Jersey boats are numbered from 1 to 7 and the New York boats from 1 to 22. Masters of vessels, when boarded by a pilot, should inquire whether he is from a New Jersey or a New York boat, so as to know where to make complaint when necessary.

GENERAL COURSES

FOR APPROACHING NEW YORK ENTRANCE FROM SEAWARD.

I. From Great Britain or Northern Europe vessels, as a rule, aim to cross the meridian of $50^{\circ} W.$ between 42° and 43° north latitude, and to pass the southern end of Nantucket Shoals in about Latitude $40^{\circ} 40' N.$, Longitude $69^{\circ} 20' W.$, from which position the course for Sandy Hook Light-vessel is **W. $\frac{3}{4}$ N.**,—the distance being nearly two hundred and seven miles. The above position is seven miles from the southern end of Phelps' Bank, with a depth of thirty-two fathoms, "fine grey sand and black specks,"—Davis' South Shoal Light-vessel bearing **NW. $\frac{1}{4}$ W.**, twenty-eight miles distant. It must be borne in mind, however, that the course (**W. $\frac{3}{4}$ N.**) for Sandy Hook Light-vessel must be *made good* by allowing for leeway and for the southwesterly set of the wind current—caused by the prevailing northeasterly winds. Should the wind be to the northward of **E.** it has been customary to allow, in order to make the course good, a set of the current to the southwestward of at least twelve miles in every twenty-four hours.† It may be said that the failure to use the lead has caused many vessels to make the Jersey coast to the southward of Sandy Hook instead of making the light-vessel or the southern coast of Long Island. The lead should be used at regular intervals on the course for the light-vessel; and when nearing the entrance (say in Longitude $73^{\circ} 15' W.$) soundings should be taken at intervals of two miles,—the depth from this point until the light-vessel is reached being in no place greater than fifteen fathoms and ranging as low as twelve. Should the weather be

† A series of regular current observations on this coast is in progress under the direction of the Superintendent of the Coast and Geodetic Survey.

thick and soundings be obtained as low as ten fathoms, the ship's head should be immediately put off shore. Striking soundings in fifteen fathoms and in doubt as to position, **SW.** by **S.** should be steered. If the soundings increase, you are on the Long Island shore; if they gradually diminish, you have fallen to the southward of the true course and overrun your distance and are on the Jersey coast. In the former case the ship may stand off and on,—taking care not to go inside of twelve fathoms,—and so gradually work up towards the light-vessel. In the latter case her head must at once be put off shore (as nearly **E.** by **S.** as possible) until twenty fathoms is reached, as before described.

Recent observations made under the direction of the Superintendent of the Coast and Geodetic Survey by Lieutenant S. M. Ackley, United States Navy, Assistant, and reduced and discussed by Prof. Henry Mitchell, Assistant, while not, as yet, sufficient in number to give entirely satisfactory results, have developed the existence of a weak tidal current off the coast between Nantucket and Cape May, accompanied by a general drift of the sea to the southwestward amounting to about seven nautical miles in twenty-four hours. This is the only apology for a "coast current" thus far discovered. Further investigations may slightly alter these results, but not to any appreciable extent.

The **W. $\frac{3}{4}$ N.** course from off Nantucket Shoals will, under ordinary circumstances and clear weather, lead a vessel within sight of Fire Island Light-house, as, if made good, it passes within ten miles of that light. In thick weather the Whistling Buoy off Fire Island Inlet will generally be heard, as the course passes about four or five miles to the southward of it. Sandy Hook Light-vessel bears from this buoy **W. Northerly**, distant thirty-one miles and a quarter. (See also page 554.) Vessels from the eastward, therefore, generally shape their course from outside Nantucket Shoals so as to make the light, or, if the weather be thick, the buoy.

If, on the **W. $\frac{3}{4}$ N.** course for the light-vessel, you should get bottom in twenty-three fathoms when you have reason to believe that you are near the entrance to New York Bay, you are over the Twenty-three Fathom Hole, and, therefore, four miles to the southward of the course,—Sandy Hook Light-vessel bearing **NW.** by **N. $\frac{1}{4}$ N.**, distant five miles and a half.

Should the depth be twenty-one fathoms, following shortly after soundings of fifteen, you are probably over the Twenty-one Fathom Hole, and Sandy Hook Light-vessel bears **N.** by **W. $\frac{3}{4}$ W.**, distant seven miles and two-thirds. This latter sounding is not, however, so certain an indication of position as that of twenty-three fathoms above mentioned, as it occurs also on the western edge of the Twenty-three fathom Hole.

When up with Sandy Hook Light-vessel follow the directions for entering the bay and harbor given on pages 563–565. In thick weather the shriek of the Whistling Buoy will certainly be heard, even though the light-vessel be not visible, as it is reported as having been distinctly heard at a distance of five miles. When heard it may be safely steered for.

Ships from Europe sometimes prefer to pass about thirty miles to the Southward of George's Shoal.—In this case they will strike soundings in about eighty-five fathoms in Latitude $41^{\circ} 20' N.$, Longitude $66^{\circ} 5' W.$; after which, as they proceed to the westward (the course being about **W. $\frac{1}{4}$ S.**) the depth will rapidly decrease to fifty fathoms and then to thirty-seven, "white and grey sand with broken shells," in Latitude $41^{\circ} 13' N.$, Longitude $66^{\circ} 45' W.$ This depth will continue until the meridian of $67^{\circ} W.$ has been passed; after which it will gradually decrease,—the depth found ranging from thirty to thirty-five fathoms. In the longitude of The Georges the depth will be about thirty-six fathoms, "fine grey sand and black specks;" and when off Nantucket there will be thirty-five fathoms, "fine white and grey sand,"—the southeastern end of the Island bearing **N.**, distant forty-eight miles, and Davis' South Shoal Light-vessel **N. $\frac{1}{2}$ E.**, distant twenty-seven miles and a half. From this position a **W. $\frac{3}{4}$ N.** course *made good* will lead directly to Sandy Hook Light-vessel. The soundings on this course will deepen to forty fathoms, "green ooze," in Latitude $40^{\circ} 27' N.$, Longitude $70^{\circ} 30' W.$ On crossing the Block Island Channel from forty-three to forty-five fathoms, "green and black mud," will be found,—Block Island bearing **N.** by **W.**, forty-seven and a half miles distant. After passing the meridian of Montauk the depth will gradually decrease until Sandy Hook Light-vessel is reached. From the light-vessel the directions for entering the bay should be followed. (See pages 563–565. Also, see Current Chart of Gulf of Maine, and Appendix No. I in explanation of that chart.)

Should the soundings suddenly decrease from fifteen to ten fathoms, rocky bottom, when, by the reckoning, the vessel should be within from fifteen to twenty miles of the light-vessel, she is to the

southward of a $W. \frac{3}{4} N.$ course and is over the Cholera Bank,—from the eastern end of which Sandy Hook Light-vessel bears $W.$ by $N. \frac{1}{4} N.$, distant eighteen miles. (In this connection consult also page 578 with reference to course of procedure when in doubt as to the ship's position.)

Should the weather be thick and the soundings, when you judge yourself near the coast, deepen suddenly from fifteen fathoms to twenty-three fathoms, you are well to the southward of the true course,—having struck the Twenty-three Fathom Hole, from which Sandy Hook Light-vessel bears $NW.$ by $N. \frac{1}{4} N.$, distant five miles and a half. Care must be exercised in approaching the coast in thick weather; and it is best to make some allowance for a westerly and southerly wind current, as it is better for a vessel to be to the eastward of her computed position than to the westward of it. The usual allowance for drift (see also page 577) is twelve miles for every twenty-four hours; but in strong northerly or northeasterly winds a greater allowance must be made, according to the judgment and experience of the navigator. In all cases during thick weather, should a sounding of ten fathoms or less be obtained when you judge yourself near the entrance, the ship's head should at once be put off shore until the weather clears up or you can get hold of the light-vessel. The tidal current has little effect upon the vessel's course until you are near the entrance, when it must be taken into account. Ebb sets to the southeastward about one mile an hour and thus assists the wind current, which sets to the southwestward during northeasterly winds. Flood sets to the northward and northwestward, and has little effect until you are fairly in the channels of the bay. Its velocity is from half to three-quarters of a mile an hour.

Aiming to pass seventy miles to the Southward of Nantucket, (as some navigators do,) you will strike soundings on the eastern edge of George's Bank in about eighty fathoms, "white sand and broken shells,"—the eastern edge of the bank being very abrupt. You will pass about forty-five miles to the southward of George's Shoal,—crossing the meridian of $67^{\circ} W.$ in Latitude $41^{\circ} N.$ and sounding over the Bank in from thirty-eight to fifty fathoms. The depth will increase to seventy fathoms on approaching the meridian of Nantucket, and diminish again as soon as you have passed the southern end of the Shoals. With the southeastern end of Nantucket bearing $N.$, distant seventy miles, you will have fifty-two fathoms, "mud and fine sand;" Davis' South Shoal Light-vessel will bear $N. \frac{1}{4} E.$, distant forty-nine miles, and the course may be shaped for Sandy Hook $W.$ by $N. \frac{1}{4} N.$, leading directly for the light-vessel. The soundings will gradually increase as Block Island Channel is approached, where, in Latitude $40^{\circ} 12' N.$, Longitude $71^{\circ} 5' W.$, there will be seventy-five fathoms, "green ooze,"—Block Island bearing $N.$ by $W.$, sixty-two and a half miles distant. From this position the soundings will gradually diminish and you will strike thirty fathoms, "grey sand," in Latitude $40^{\circ} 18' N.$, Longitude $72^{\circ} 16' W.$, with Shinnecock Light-house bearing $N. \frac{3}{4} W.$, distant thirty-six miles. This depth will continue for about fifteen miles, and then the water will gradually shoal until you strike the eastern edge of the Cholera Bank, where you will have ten and eleven fathoms, rocky bottom. After crossing this bank the soundings will deepen until you strike fifteen fathoms, when you will be within six miles and a half of the light-vessel. If you should not strike soundings on the Cholera Bank and get nothing less than fourteen to sixteen fathoms, the probabilities are that you are to the southward of the true course and must steer more to the northward to make the light-vessel. (In this connection see also the remarks on page 576 in reference to the Twenty-three Fathom Hole and to the course to be pursued in thick weather when near the coast.)

Aiming to pass eighty miles to the Southward of Nantucket, (a not infrequent course,) you will not strike soundings in less than one hundred fathoms until you are to the westward of the southeastern end of the Shoals, where you will have about seventy fathoms, "mud and fine sand," with the southeastern end of Nantucket bearing $N.$, distant eighty miles. From this position $W.$ by $N. \frac{1}{2} N.$ will lead directly up to Sandy Hook Light-vessel. On coming into Block Island Channel the depth will be about eighty fathoms, "green ooze,"—Block Island bearing $N.$ by $W.$, distant sixty-nine miles. From this position the depth will gradually diminish until you strike thirty fathoms, in Latitude $40^{\circ} 16' N.$, Longitude $72^{\circ} 21' W.$ On reaching the edge of the Cholera Bank you will have eleven fathoms, rocky bottom, rapidly shoaling to ten fathoms; and Sandy Hook Light-vessel will bear $W.$ by $N. \frac{1}{4} N.$, distant eighteen miles. The soundings on the bank (from ten to twelve fathoms) will continue for five miles and a half; after which the water will deepen gradually; and when you get fifteen fathoms you will be six miles and a half from the light-vessel. When up with her follow the directions for entering

the bay on page 564. Failing to strike soundings on the Cholera Bank and getting nothing less than fourteen or sixteen fathoms, you are, in all probability, to the southward of the true course and must steer more to the northward in order to make the light-vessel. (In this connection consult also pages 576-577 in reference to the Twenty-three Fathom Hole and to the soundings on the Jersey coast.)

Vessels which aim to pass about ninety miles to the southward of Nantucket should endeavor to make the meridian of $68^{\circ} 35' W.$ in Latitude $39^{\circ} 43' N.$, (from which position the southeastern end of Nantucket bears **N.**, distant ninety miles,) and steer **W.** by **N.** $\frac{3}{4}$ **N.** for Sandy Hook Light-vessel. On this course soundings will first be found in less than one hundred fathoms in Latitude $40^{\circ} N.$, Longitude $71^{\circ} 17' W.$, when Block Island will bear **N.** $\frac{1}{4}$ **W.**, distant seventy-one miles. From this position the depth will gradually decrease,—forty fathoms, "blue mud and sand," being found in Latitude $40^{\circ} 7' N.$, Longitude $72^{\circ} W.$; thirty fathoms in Latitude $40^{\circ} 14' N.$, Longitude $72^{\circ} 37' W.$; twenty fathoms in Latitude $40^{\circ} 20' N.$, Longitude $73^{\circ} 11' W.$; fifteen fathoms in Latitude $40^{\circ} 22' N.$, Longitude $73^{\circ} 22' W.$; and the southwestern edge of the Cholera Bank will be reached in Latitude $40^{\circ} 53' N.$, Longitude $73^{\circ} 34' W.$, with eleven fathoms, rocky bottom,—Sandy Hook Light-vessel bearing **W.** by **N.** $\frac{3}{4}$ **N.**, distant fourteen miles. The water will now gradually deepen to sixteen fathoms, which will be found five miles and a half to the eastward of the light-vessel.

When in the vicinity of $72^{\circ} 30' W.$, should the water deepen from thirty-five to fifty fathoms, the vessel is well to the southward of the true course and over the Fifty Fathom Hole,—Sandy Hook Light-vessel bearing **NW.** by **W.** $\frac{1}{4}$ **W.**, distant sixty-eight miles. The bottom will be grey sand and black specks, and the vessel should haul to the northward,—allowing at least half a point for the westerly set of the wind current if the wind be to the eastward or northeastward.

Failing to strike soundings on the Cholera Bank, but getting, on the contrary, fourteen fathoms when he judges himself in its vicinity, the navigator is, in all probability, to the southward of his proper course and should haul to the northward until the water shoals to eleven and thirteen fathoms. (See, also, remarks concerning the Twenty-three Fathom Hole and the soundings on the Jersey coast on pages 576-577.)

Sailing vessels between England and New York pursue various routes, according to the judgment and experience of their commanders,—some using the Northern and others the Middle Passage when bound to the westward. When outward bound, that is from New York to England, they are apt to keep well to the southward. *Vessels from Liverpool to New York*, (especially during the autumn,) after leaving the coast of Ireland steer so as to cross the meridian of $30^{\circ} W.$ in Latitude $53^{\circ} 30' N.$ They then steer to the southwestward, crossing the northern end of the Outer Bank of Newfoundland in Latitude $47^{\circ} 30' N.$, Longitude $45^{\circ} W.$, and reach the eastern edge of the Grand Banks in Latitude $44^{\circ} 45' N.$, Longitude $49^{\circ} 15' W.$ They leave the Banks in Latitude $43^{\circ} 45' N.$, Longitude $52^{\circ} W.$, cross the meridian of $60^{\circ} W.$ in Latitude $41^{\circ} 45' N.$, and pass about fifty miles to the southward of Nantucket in from thirty to forty fathoms. This course passes forty miles to the southward of George's Bank,—crossing its meridian in from thirty-five to forty-five fathoms, "fine dark sand." After passing to the westward of the meridian of The Georges the soundings will deepen to fifty fathoms and then gradually shoal to about thirty-five fathoms; when they will be past the outer shoals of Nantucket, with Davis' South Shoal Light-vessel bearing **N.** $\frac{3}{4}$ **E.**, twenty-four miles and a half distant, and a course may be laid for Sandy Hook. On this course the soundings will gradually increase to thirty-eight fathoms, "blue mud," "green mud" and "sand," and will continue at that depth until the vessel is nearly in the longitude of Montauk Point,—having the light-house on that point bearing **N.** $\frac{1}{2}$ **W.**, about thirty-eight miles distant, and Block Island Southeast Light-house **N.** by **E.** $\frac{3}{4}$ **E.**, forty-one miles distant. From this position the depth will gradually decrease until Sandy Hook Light-vessel is reached.

In the early part of the year (say during March and April) sailing vessels run to the westward from the mouth of the English Channel until they reach the meridian of $14^{\circ} 35' W.$, when they change course to the southwestward,—aiming to cross the meridian of $20^{\circ} W.$ in Latitude $46^{\circ} N.$ The course is continued to the southward until Latitude $44^{\circ} 45' N.$ and Longitude $22^{\circ} 15' W.$ is reached, when a course nearly **W.** (*true*) is run to the eastern edge of the Grand Banks, which it meets in Latitude $44^{\circ} 45' N.$, Longitude $49^{\circ} 10' W.$ This *true W.* course is continued to about the middle of the Banks, in Latitude $44^{\circ} 40' N.$, Longitude $50^{\circ} 40' W.$, (or about one hundred and seventy-five

miles to the southeastward of Cape Race,) where it changes to the southwestward so as to cross the meridian of 60° W. in Latitude $41^{\circ} 45'$ N. and to pass about fifty miles to the southward of Nantucket in from thirty to forty fathoms. When in Latitude $40^{\circ} 40'$ N. and Longitude $69^{\circ} 19'$ W., the course for Sandy Hook Light-vessel is $W. \frac{3}{4} N.$

II. *From Spain or from the Mediterranean Sea.*—Steamships from these places bound to New York make The Azores and thence either make a straight course for Sandy Hook Light-vessel (crossing the meridian of 40° W. in Latitude about $39^{\circ} 10'$ N.) or else aim to reach the Bermudas and strike the Gulf Stream in the neighborhood of Cape Hatteras. Sailing vessels from the Mediterranean or from Portuguese ports endeavor to pass the meridian of 40° W. in Latitude $42^{\circ} 55'$ N.; to hit the southern end of the Grand Banks in Latitude 43° N., Longitude $49^{\circ} 50'$ W., (two hundred and seventy-five miles southeast from Cape Race;) to cross Longitude 60° W. in Latitude $42^{\circ} 15'$ N.; and to pass forty-eight miles to the southward of Nantucket. These courses lead to the southward of The Georges and Nantucket Shoals and on about the same line as that pursued by vessels from England; but as it passes only about one hundred and sixty miles to the northward of The Azores it properly comes under the head of the Southern Passage.

III. *From any part of the Eastern Coast of South America.*—Vessels from Rio Janeiro or other ports on the eastern shore of South America bound to New York endeavor to strike the southeastern edge of the Gulf Stream in about the latitude of St. John's River, Florida, ($30^{\circ} 20'$ N.) which will give an approximate longitude of $71^{\circ} 45'$ W. and a surface temperature of 78° Fahrenheit. They pass about one hundred and sixty miles to the eastward of Cape Hatteras and make as nearly a straight course as possible for Sandy Hook,—steering about $N. \frac{3}{4} W.$ Those bound from New York to the South American coast, however, steer well to the eastward, crossing the parallel of 30° N. in Longitude 43° W., and the meridian of 40° W. in Latitude 26° N. They cross "The Line" in Longitude $30^{\circ} 30'$ W. and thence steer a nearly straight course for Cape Frijole. Steamships from Rio Janeiro to New York run along the South American coast as far as Para; thence go to St. Thomas; and thence make nearly a straight course to New York. They cross Latitude 30° N. in Longitude $69^{\circ} 10'$ W., and here are apt to meet the southern edge of the Gulf Stream with a temperature of 78° Fahrenheit. They pass Cape Hatteras at a distance of about two hundred and forty miles. Should a vessel pursuing these courses get soundings off the coast of the United States in Latitude $39^{\circ} 40'$ N., Longitude $73^{\circ} 12'$ W., with a depth of thirty-five fathoms, "black mud," following soundings of from twenty to twenty-five fathoms, "coarse grey sand" and "grey sand and pebbles," she is to the eastward of her course and over the Thirty-five Fathom Hole, with Sandy Hook Light-vessel bearing $NW.$ by $N. \frac{1}{4} N.$, fifty-seven and three-quarters miles, and Navesink Light-houses $NW. \frac{3}{4} N.$, fifty-nine and a quarter miles distant. The course for the light-vessel from the latitude of Hatteras is $N.$ by $W. \frac{3}{4} W.$

IV. *From Cape Horn.*—Vessels from Cape Horn cross "The Line" in Longitude 30° W. and then steer to the northwestward, passing well to the eastward of the Windward Islands; strike the meridian of 71° W. in Latitude 30° N. and the outer edge of the Gulf Stream in Latitude $30^{\circ} 30'$ N., Longitude $71^{\circ} 5'$ W.; pass one hundred and sixty miles to the eastward of Cape Hatteras, and make a straight course ($N. \frac{3}{4} W.$) thence for Sandy Hook Light-vessel. They leave the northern edge of the Stream in Latitude $38^{\circ} 40'$ N., Longitude $73^{\circ} 15'$ W.,—striking soundings at that point in less than one hundred fathoms,—Sandy Hook Light-vessel bearing $N. \frac{3}{4} W.$, distant one hundred and twelve miles.

V. *Vessels from Jamaica, Hayti, the South Side of Cuba, or Aspinwall,* pass through the Windward Passage, (between Cuba and Hayti;) then take the Crooked Island Passage through The Bahamas, and make as nearly as possible a straight course for New York. They cross the parallel of 30° N. in about 73° W., strike the southern edge of the Gulf Stream with a temperature of 78° Fahrenheit, and pass between one hundred and ten and one hundred and fifteen miles to the eastward of Hatteras and between sixty and seventy miles to the eastward of the Capes of the Delaware. They leave the northern edge of the stream in Latitude $38^{\circ} 30'$ N., Longitude $73^{\circ} 35'$ W.; and the course from off Hatteras is $N. \frac{1}{4} W.$ for Sandy Hook Light-vessel.

VI. *Vessels from Nassau, Havana, or the Gulf of Mexico,* pass through the "Hole in the Wall," cross the parallel of 30° N. in Longitude $76^{\circ} 5'$ W., (striking at the same point the southern

edge of the Gulf Stream,) and make Cape Hatteras light bearing **NW.**, distant between sixteen and seventeen miles. Thence they steer **N.** by **E. $\frac{3}{4}$ E.** to make Barnegat light. Or, making a straight course for New York, they cross the parallel of 30° N. in Longitude $75^{\circ} 51'$ W. (striking the southern edge of the Gulf Stream at the same point) and pass forty miles to the eastward of Cape Hatteras. The course from off Hatteras to the light-vessel is **N.** by **E. $\frac{1}{4}$ E.**

GENERAL COURSES

FOR COASTING VESSELS APPROACHING NEW YORK HARBOR.

I. From the Eastward, outside of Nantucket Shoals.—As before mentioned (pages 180–182) there are two systems of sailing in use by vessels from the eastward which intend to pass outside of Nantucket Shoals, viz: that which contemplates making the light-vessel on Davis' South Shoal a point of departure, and that which passes clear outside of all the Shoals and not less than twenty-five miles to the southeastward of the light-vessel. *If the former course be pursued:* When up with Davis' South Shoal Light-vessel the course for Sandy Hook Light-vessel will be **W. $\frac{1}{4}$ S.** and the distance about one hundred and eighty-five miles. The soundings on this course vary from eight to thirty-six fathoms,—the shoal water being found from two to three miles to the westward of Davis' South Shoal Light-vessel. The lead should be used frequently while on this course, especially in thick weather; and when the reckoning and soundings indicate a near approach to New York Entrance and Sandy Hook Light-vessel cannot be seen, the vessel's head should be turned off shore unless the Whistling Buoy can be heard. In the latter case the buoy may be safely steered for.

There is *supposed* to be a perceptible southwesterly current off the southern coast of Long Island which has been credited with having caused vessels to make the land to the southward of Sandy Hook; and, as that is an extremely dangerous coast, too much care cannot be taken to make the prescribed course good by frequent soundings and a strict attention to the vessel's helm. Navigators have frequently gone ashore on the Jersey beach by a miscalculation of their run and neglect to sound, when the use of the lead would have warned them of danger in ample time to escape it.

Falling in to the southward of the entrance, if the weather should become thick, keep off shore until you strike twenty fathoms, (which will be found at a distance of from seven to thirteen miles from the beach,) and steer **N.** by **W. $\frac{1}{2}$ W.** for Sandy Hook Light-vessel. This is a good and safe course.

When up with the Light-vessel or the Whistling Buoy follow the directions for entering the bay and harbor given on pages 564, 566–567, 568, 570 and 571–572.

If intending to pass clear outside of all the Nantucket Shoals: Large vessels, and especially those whose masters are little acquainted with the wind currents and outlying banks of Nantucket Shoals, are accustomed, when bound to New York, to pass the southeastern extremity of the Shoals at a distance of not less than seven miles from the southern end of Phelps' Bank. This distance gives a position in Latitude $40^{\circ} 40'$ N., Longitude $69^{\circ} 19'$ W., and a depth of thirty-two fathoms, "fine grey sand and black specks." From this position **W. $\frac{3}{4}$ N.** will lead to Sandy Hook Light-vessel, which is distant nearly two hundred and seven miles. (See pages 577–578 for Sailing Directions on this course.)

II. Having come through Nantucket and Vineyard Sounds, but wishing to avoid Long Island Sound and the passage of Hell Gate. With Vineyard Sound Light-vessel bearing **NW. $\frac{3}{4}$ W.**, distant two miles, the course to pass to the southward of Block Island is **W.** by **S. $\frac{3}{4}$ S.**, which will lead with not less than eleven fathoms two miles and a quarter to the southward of the island. This course continue until you have run nearly thirty-eight miles, when Montauk Point Light-house will bear **W.** by **N. $\frac{1}{4}$ N.**, distant eight miles and a quarter. The depth here will be twenty-four fathoms and the course may be altered slightly to the northward,—steering **W.** by **S. $\frac{1}{2}$ S.** forty miles (carrying not less than eleven fathoms) until Shinnecock Light-house bears **N.** by **W. $\frac{1}{4}$ W.**, distant four miles and three-quarters. Here the depth will be thirteen fathoms and the course **W.** by **S. $\frac{1}{4}$ S.** for thirty-six miles until Fire Island Light-house bears **N.** by **W.** Northerly, distant three miles. Here the depth will be again thirteen fathoms, with the Whistling Buoy off Fire Island Inlet bearing **S.** by **E.** distant nearly three miles; and **W. $\frac{1}{4}$ S.** for thirty-one miles will lead with not less than nine fathoms up to Sandy Hook Light-vessel.

The above courses are safe except in strong southerly winds, in which case it will be necessary to allow for the set of the wind current towards the Long Island shore,—but a quarter of a point on each

course will be sufficient. Under ordinary circumstances the set of the flood is directly along the beach; while the ebb off Montauk sets to the southward, or directly across the course. Between Shinnecock and Fire Island the ebb sets sometimes to the eastward and sometimes to the north-eastward,—in the latter case obliquely on to the beach. Between Fire Island and Sandy Hook the current of ebb sets generally to the southeastward; while the flood (especially in the neighborhood of the inlets) has a tendency to set to the north-westward and is quite strong,—running from one mile and a half to two miles and a half an hour. Therefore, between these last two points it will be necessary during flood tide to steer to the southward of the given course in order to make the light-vessel. The current in the vicinity of Montauk is quite strong,—the flood running from one mile and a half to two miles an hour, and the ebb being even stronger. Between Shinnecock and Fire Island, however, it rarely reaches the velocity of one mile.

In thick weather and during strong winds from the southward—especially southeast snow-storms—we would recommend strangers on this coast, under no circumstances, to go inside of fifteen fathoms, sounding frequently.

If in doubt as to your position steer **SW.** by **S.** Then, if the soundings increase, you are on the Long Island shore; if they diminish gradually your reckoning has been overrun and you are on the Jersey coast. In the former case stand off and on,—taking care not to go inside of twelve fathoms. With a westerly wind you may thus work up slowly towards the light-vessel without running into danger. If on the Jersey coast, put the ship's head at once to the eastward, stand off, and heave to until the weather clears up.

When up with Sandy Hook Light-vessel follow the directions for the several channels given on pages 564, 566–567, 568 and 570.

III. Coming from the Southward.—Vessels from the southward, bound to New York, in some cases make the light-vessel on Five Fathom Bank (off the entrance to the Delaware) and in others endeavor to make Barnegat Light-house. *In the former case* it is safe in clear weather to pass one mile outside the light-vessel in about fourteen fathoms, “coarse grey sand and broken shells,” and steer **NE.** by **N.** Northerly for nearly sixty miles to abreast of Barnegat, with soundings varying from eight to seventeen fathoms. When Barnegat Light-house bears **NW.** by **W.**, distant about seven miles, the depth will be twelve and a half fathoms,—Sandy Hook Light-vessel bearing **N.** by **E.** $\frac{1}{4}$ **E.**, distant about forty-five miles. From this position the course is clear for the light-vessel with not less than ten fathoms. When up with the light-vessel or with the Whistling Buoy follow the directions for the harbor on pages 563–564.

The above courses keep an average distance of six miles from the Jersey coast between Little Egg Harbor and Sandy Hook and are perfectly safe in clear weather. In thick weather keep outside of fifteen fathoms, especially when to the northward of Barnegat, (the most dangerous part of the coast,) where a depth of ten fathoms is found in several places within one mile of the beach. By keeping outside of fifteen fathoms you are sure to be safe until the weather clears up and you are enabled to lay your course with precision.

A good rule is to continue the **NE.** by **N.** Northerly course from off Five Fathom Bank Light-vessel until you strike twenty fathoms, when you will be between fifteen and twenty miles to the northward of Barnegat and about fourteen miles from the beach. Now steer **N.** $\frac{3}{4}$ **W.**, which will lead direct for the light-vessel,—the soundings varying from thirteen to twenty fathoms. An allowance of half a point should be made for the tidal current unless the wind be to the eastward, when a point will not be too much to allow.

As a rule the tidal currents on the coast of New Jersey when uninfluenced by the winds follow the trend of the shore except close in near the entrance of the several inlets, where the current of flood sets inshore and that of ebb offshore.

In easterly gales the foregoing courses may be modified so as to keep farther from the beach. A good rule is to steer **NE.** $\frac{3}{4}$ **N.**, from about one mile outside of Five Fathom Bank Light-vessel, until Absecon Light-house bears **NW.** $\frac{1}{4}$ **W.**, distant about twelve miles. On this course there will be less than eleven fathoms. From the last bearing of Absecon Light-house the course will be **NE.** by **N.** for thirty miles, carrying not less than ten and a half fathoms, until Barnegat Light-house bears

NW. by **W.**, eleven miles distant. Here the depth will be fifteen fathoms, "coarse grey sand and broken shells," and Sandy Hook Light-vessel will bear **N. $\frac{3}{4}$ E.**, forty-seven miles distant. This course, if made good, will lead with not less than ten fathoms safely up to the entrance; after which the directions for the harbor given on pages 563-564 must be followed.

These courses in no case approach the Jersey beach nearer than six miles, which occurs in the vicinity of Long Branch; but between Barnegat and Squam Beach (where the shore is boldest-to) they pass from eight to eleven miles from it. They are, therefore, perfectly safe, even in easterly weather, provided it be clear.

Intending to make a land-fall near Barnegat: When Cape Hatteras Light-house bears **NW.**, distant seventeen miles, with forty fathoms, steer **N.** by **E. $\frac{1}{2}$ E.** for two hundred and seventy-eight miles, when you should make Barnegat Light-house bearing **NW.** by **N.**, distant fifteen miles. Here the depth will be about fourteen fathoms, "grey sand, with black and yellow specks,"—Sandy Hook Light-vessel bearing **N. $\frac{3}{4}$ E.**, distant about fifty-three miles. Steer for the light-vessel, carrying not less than twelve fathoms, except when about six and a half miles from it, where there will be a few casts of ten fathoms. When up with the light-vessel follow the directions for entering the harbor given on pages 563-564.

On the above courses the depth will gradually increase from the point of departure off Hatteras until in Latitude 37° N., Longitude $74^{\circ} 37'$ W., at which point the depth will be about fifty fathoms. Thence to the northward the depth will gradually diminish—ranging from forty to twenty fathoms—until in the latitude of Cape May; after which the soundings become more irregular,—ranging between twenty-four and thirteen fathoms from the latitude of Cape May to that of Absecon; between twelve and sixteen fathoms from Absecon to Barnegat; and between twelve and fifteen fathoms from Barnegat to the light-vessel.

In thick or foggy weather, when the ship's reckoning indicates that she is near the Jersey coast, great care should be taken to make frequent and accurate soundings with an armed lead. The soundings are not sufficiently characteristic along this part of the coast to make it possible to give precise rules for determining the ship's position by the depth of water or character of the bottom. There is, however, one rule which, if strictly adhered to, will keep the vessel out of danger until the weather clears up and her position can be accurately determined, viz: Should at any time a sounding of ten fathoms or less be obtained, the course should be immediately changed to the eastward until the water deepens to fourteen fathoms; after which care should be taken to keep outside of that depth.

In beating to windward in thick weather, vessels on the inshore tack, to the southward of Barnegat, should go about as soon as they strike ten fathoms; and when to the northward of Barnegat as soon as they strike eleven fathoms. A stranger overtaken by thick weather, when, from his reckoning and the character of the soundings, he has reason to believe he is too near the coast, should put the ship's head offshore and stand off and on under easy sail,—taking frequent soundings.

As mentioned on page 577, and as will be seen by a reference to the "Extracts from the Pilot Laws of New York Harbor," (Appendix No. II,) pilots will be found frequently cruising as far as three hundred and fifty miles from Sandy Hook, and it is strongly recommended to strangers to accept the first offer of pilotage on their approach to the coast. By this means they will not only have the advantage of the pilot's local knowledge of the set of the wind currents and the time of the tides, but he will also be able to inform them as to the character of the weather just preceding their arrival;—whether any local storms have prevailed affecting the set or velocity of the currents, removing or displacing the buoys; whether any changes have been made in the character of the light-houses, &c., which might lead to a change in their course of procedure on approaching the harbor.

GENERAL REMARKS

ON STEAMSHIP COURSES BETWEEN EUROPE AND NEW YORK.

There are three general routes in use by vessels from Europe bound to New York, usually known as the **Northern**, **Middle** and **Southern** passages. The first is by far the most frequently used; although the Middle Passage is a favorite with many ship-masters,—especially during the winter. The Southern Passage is rarely used by vessels from Great Britain or France; but as it is the most direct route from Spain, Portugal and the Mediterranean, and has, moreover, the advantage of two "houses

of call" on the route, (The Azores and Bermuda,) it is that most commonly adopted by vessels from Southern Europe. In severe winters, when the icebergs are found in low latitudes, this passage is sometimes used by sailing vessels from Great Britain also, whose masters prefer a delay of some days in reaching their destination to the risk of encountering the ice; but steamships rarely use it. A few remarks descriptive of the several tracks pursued by steamships will not perhaps be out of place.

I. *The Cunard Line*, with a view of diminishing the chances of collision, takes a specified course during all seasons of the year. Coming westward, (from Queenstown to New York,) vessels of this line cross the meridian of 50° W. in Latitude 43° N.,—or nothing to the northward of that parallel. They cross Longitude 60° W. in Latitude 42° N., and in thick weather pass Nantucket Shoals in Latitude $40^{\circ} 40'$ N., Longitude $69^{\circ} 19'$ W.; from which position the course for Sandy Hook Light-vessel is W. $\frac{3}{4}$ N. (See also pages 577–578.) In clear weather they frequently pass within six miles of Davis' South Shoal Light-vessel.

Going eastward (from New York to Queenstown) these vessels cross the meridian of 50° W. in Latitude 42° N.,—or nothing to the northward of that latitude; and thence follow, as nearly as possible, the arc of a Great Circle, which passes Longitude 40° W. in Latitude $46^{\circ} 6'$ N., 30° W. in $48^{\circ} 51'$ N., and 20° W. in $50^{\circ} 30'$ N. On this eastern course they pass Nantucket Shoals in Latitude $40^{\circ} 40'$ N.,—or ten miles to the southward of their position going westward. The whole distance by this route—between Fastnet and Sandy Hook—is two thousand seven hundred and eighty-four miles going west, and two thousand eight hundred and eighteen miles going east.

II. *The White Star Line* crosses the meridian of 50° W., as follows:

Bound to New York, from February to August, in Latitude 43° N.

Bound to New York, from August to February, in Latitude $45^{\circ} 50'$ N.

Bound to Queenstown, all the year round, in Latitude 41° N.

The routes westward pass Nantucket Shoals in about $40^{\circ} 40'$ N., while the eastward course passes the Shoals in about $40^{\circ} 20'$ N. The distance from Queenstown to Sandy Hook is, by the summer route, two thousand eight hundred and fifty-five miles; by the winter route, two thousand seven hundred and eighty-three miles; and by the homeward (that is "easterly") route, two thousand eight hundred and eighty-nine miles.

III. *The Inman Line* crosses the meridian of 40° W. in Latitude $46^{\circ} 50'$ N., and that of 50° W. in Latitude 42° N.; and passes Nantucket Shoals in Latitude $40^{\circ} 40'$ N. The distance by this route, from Queenstown to Sandy Hook, is two thousand seven hundred and seventy-three miles.

IV. *The Anchor Line*, from Glasgow to New York, crosses the meridian of 20° W. in Latitude $54^{\circ} 10'$ N., that of 30° W. in Latitude $52^{\circ} 15'$ N., that of 40° W. in Latitude 50° N., and that of 50° W. in Latitude $45^{\circ} 50'$ N.,—or just to the southward of the *Virgin Rocks*. This route passes Nantucket Shoals in Latitude $40^{\circ} 40'$ N.; and thence the course to Sandy Hook Light-vessel is W. $\frac{3}{4}$ N. From New York to Glasgow, vessels of this line cross Longitude 50° W. in Latitude 45° N., that of 30° W. in $51^{\circ} 30'$ N., and that of 20° W. in $53^{\circ} 50'$ N. This route is generally known as the "Summer" or "Northern Track."

From Liverpool to New York, vessels of the Anchor Line cross the meridian of 30° W. in Latitude $49^{\circ} 30'$ N., that of 50° W. in Latitude $43^{\circ} 40'$ N., and Nantucket Shoals in Latitude $40^{\circ} 30'$ N. From New York to Liverpool, they cross Longitude 50° W. in Latitude $42^{\circ} 40'$ N., and 30° W. in Latitude $48^{\circ} 15'$ N. This is known as the "Winter" or "Southern Track."

From the Straits of Gibraltar to New York, vessels of the Anchor Line either proceed by direct route,—passing about ninety miles to the northward of the Azores;—or they touch at Fayal and then proceed directly for New York. In the former case they pass the meridian of St. Michael (26° W.) in Latitude $40^{\circ} 40'$ N., the meridian of 50° W. in Latitude 42° N., and Nantucket Shoals in Latitude $40^{\circ} 40'$ N. In the latter case, after leaving Fayal, they cross the meridian of 30° W. in Latitude $38^{\circ} 40'$ N., that of 50° W. in Latitude $41^{\circ} 20'$ N., and Nantucket Shoals in Latitude $40^{\circ} 40'$ N.

V. *The North German (Bremen) Line* has no regular route,—the track pursued by each commander being the one his judgment and experience point out as the best. In general, however, it may be remarked that they cross the meridian of 50° W. in Latitude $44^{\circ} 30'$ N.,—or about eighty miles to the southward of the *Virgins*,—and pass Nantucket Shoals in Latitude $40^{\circ} 28'$ N.

In this connection (the views of experienced and intelligent navigators being always of great value) it seems proper to introduce some extract from a communication by Captain W. Watson, of the Cunard Line of Steamships, one of the most skillful and reliable navigators sailing in and out of New York Bay.

Referring to the disputed question as to the existence of a coast current setting to the westward and southward between Nantucket and New York, Captain Watson remarks: "In one hundred and twenty passages between Liverpool and New York I can only find eight cases where the steamship I commanded has been to the westward of her Dead Reckoning—never exceeding ten miles. On the noon of the day following our departure from New York she has, in thirteen cases, been to the southward from six to ten miles; and in every case we have left New York with northerly winds, which were carried for many hours after sailing.

"From Longitude 66° to 70° there is usually a southerly set with a strong northerly wind,—particularly if there is any easting in it,—but I have never found it to exceed half a mile an hour. After passing the latitude of Nantucket it continues to run almost due S. and is lost in the deep water to the southward of Latitude 40° N. *To the westward of Longitude 70° W. this set does not exist.*

"In looking over some observations of surface temperature, taken during the last fifteen years, I find the temperatures higher between the meridians of 70° and 72° W. than between those of 68° and 70° W.,—the following differences being observed and recorded: In November $5^{\circ}.6$, in December $3^{\circ}.9$, in January 3° , in February and March 2° , and in April 5° . To the westward of Longitude 72° the water is affected by the discharge from the Hudson, which fact would seem to militate against the theory of a westerly current.

"In seventeen passages from Boston to New York—always passing to the eastward of Fishing Rip—I have never, except in one instance, experienced a set of more than half a mile per hour to the southward. In the exception referred to the ship had a strong northerly wind, amounting at times to a gale, and a drift was perceived of about three-quarters of a mile per hour. It would be absurd to call this drift a current."

Such vessels as have from time to time been stranded on the beach when endeavoring to make New York Entrance owe their misfortunes probably to a neglect of the proper use of the lead. No one need get ashore on either the Long Island or the Jersey beach if the lead is often used and accurate soundings secured. In this connection Captain Watson remarks:

"The 'Queen' stranded at Squan Beach in a fog, and it is claimed by the advocates of the south-westerly current that being ahead of her Dead Reckoning and too far to the southward shows a set in that direction. But, on the same day, the 'Vicksburg,' coming from the southward, *was wrecked on Fire Island*,—having mistaken Fire Island light for Barnegat light! Thus, on the same day, the 'Queen' was to the southward and westward of her Dead Reckoning, while the "Vicksburg" was to the northward and eastward of hers! Are we to believe, then, that the current setting to the westward and southward caused the loss of both vessels?—the one being twenty miles to the southward of Sandy Hook Light-vessel and the other seventy miles to the northeastward of her Dead Reckoning!

"So many cases similar to that of the 'Queen' have occurred that, in view of the well-marked approaches to the harbor, one is inclined to ask if the lead was used at all on board the wrecked vessels, and if so, if any judgment was given to the matter. Witness the cases of the 'Circassian,' 'Amerique,' and 'Rusland.' From the day I first put my foot on board of a ship I have always heard strandings, wrecks,—in fact any error made in a ship's position,—put down to an unusual current, or (so called) errors in the compass.

"I have given some little attention to the currents on the track between New York and the British Isles. If a steamer bound for New York has strong easterly winds from the meridian of 55° W. she will, without doubt, find herself ahead of her Dead Reckoning; but, however strong or weak the set may be, she will have the whole of it between Longitudes 53° and 71° W.,—none to the westward of the latter meridian. In the many passages I have made between Davis' South Shoal Light-vessel and Sandy Hook I have never found my ship more to the southward and westward than could be accounted for by bad steering or a careless log. At all times the *tides* are strong about the Nantucket Shoals, as I have frequently experienced when passing the light-vessel. If I happen to pass on the west-going *tide*, it would be hardly fair to say 'the *current* is setting to the westward and southward at a rapid rate.'

"For twelve years and a half I have been in command, and, with the exception of a few passages to Boston, I have been constantly running to and from New York. In approaching from the eastward I endeavor to cross the meridian of 66° in Latitude $41^{\circ} 20'$, steering for a point in Latitude 41° N., Latitude 68° W.; thence, if the weather is clear, to pass six miles to the southward of Davis' South Shoal Light-vessel. If the weather is thick, or likely to be so, I aim to cross 70° W. in $40^{\circ} 40'$ N., keeping the lead going every hour until within a few miles of the light-vessel; after which it is hove every fifteen minutes until I pick up the shoal water extending to the southward of the South Shoal. The moment I strike this shoal water I am sure of my longitude, and also know that my latitude cannot be much in error. I then steer for a position eight miles due S. of Shinnecock Light-house; and, when we have made that distance, W. by S. $\frac{1}{2}$ S. until abreast of Fire Island; and then W. for Sandy Hook Light-vessel. These courses should take the steamer about a mile and a half to the southward of that light-vessel. If the courses and distances are laid down on the chart it will be seen that the ship cannot be very much to the northward without the lead showing it, nor much to the southward without giving a greater depth. As a matter of course every attention must be paid to the *deviation* of the magnetic needle (for deviation does change) and the courses and log looked closely after,—keeping the ship going at a uniform speed and never stopping but when absolutely necessary to verify the lead. When closing with Sandy Hook Light-vessel the ship may be stopped so as to make sure of finding the somewhat deeper water a little to the eastward of the position in which the light-vessel lies. Should the steamer be anything within eight miles to the southward of her, the Holes† cannot be missed; and then it is simply hauling up for the light-vessel, which cannot be passed without being seen or her fog-signals heard.

"I have said that the steamer should not be stopped more than once or twice to verify the sounding machine. I have found that stopping to sound—say every hour—will throw a ship out of her reckoning more than anything else. In fact the position given after stopping a dozen times is a question of guesswork, and is *invariably astern of the ship's actual place*. By keeping her going six or eight knots, using a good sounding machine, the error of which is known, steering certain courses, and running given distances, any man can bring his ship along with certainty and put her in a position for entering New York Harbor whenever the fog lifts. Soundings to be of use must be taken *early and often*; and if the commander of a steamer coming on the coast in the winter time will not verify his position by dropping the lead at least every two hours, he can blame no one but himself if mishap occurs. Nearly all these theories of currents are advanced to cover negligent navigation; and I have no hesitation in saying that all the ships that have gone ashore of late years on the Jersey beach have done so through neglect of the lead."

ARTHUR KILL.

As before mentioned Kill Van Kull leads into Newark Bay and also up to the town of **Elizabethport**. This town, situated at the northern end of Arthur Kill, is a place of some manufacturing interest and forms the eastern extremity of the town of **Elizabeth**, a thriving town of about twenty-five thousand inhabitants. Arthur Kill, which separates Staten Island from the mainland on the west, has a width of from two hundred to eleven hundred yards and a depth of not less than thirteen feet at low water. The entrance from Raritan Bay is between Ward's Point (the southwestern end of Staten Island) on the east and Ferry Point on the west. This latter, which is also the northern point of entrance to Raritan River, is the southern extremity of **Perth Amboy**,—a village of about four thousand inhabitants. Between Ward's Point and Ferry Point the entrance to Arthur Kill is three-quarters of a mile wide; but it rapidly diminishes to about six hundred yards, which width it keeps for about one mile and three-quarters to **Ploughshare Point**, after which it gradually widens out, attaining a width of from three-eighths to half a mile, until you come abreast of **Smoking Point**, two miles and a half above Ploughshare Point. Above this the average width is about four hundred yards for about three miles, where a marsh island three-quarters of a mile long, known as Prall's Island, lies **Prall's Island**, exactly in the middle of the river, dividing it into two channels, called the **North Reach** and **Northwest Reach**, and each about two hundred yards wide. The Northwest Reach is the best passage,—having not less than thirteen feet at low water. Above Prall's Island the creek gradually diminishes in width, and abreast of Elizabethport is but two hundred yards wide, with a depth in the channel of from nineteen to twenty-three feet at low water.

The southwestern shore of Staten Island, which forms the eastern bank of Arthur Kill from Ward's Point to Smoking Point, will appear as a well cultivated, thickly settled and rolling country,—the heights varying from twenty to sixty feet. Thick woods crown the summits in the background. The village of **Tottenville** is situated about one mile above Ward's Point;

† The Twenty-three and Twenty-one Fathom holes.—*Compiler*.

and nearly a quarter of a mile above this, on the western bank, at the northern extremity of Perth Amboy, and a quarter of a mile below Ploughshare Point, are the docks of the Easton and Amboy Railroad.

On the western bank of the creek the shore is nearly all low and marshy. Eight hundred yards to the northward of Ploughshare Point is Terrill's Creek, a very small stream of no importance; and five-eighths of a mile above this is **Woodbridge Creek**, larger, but crooked and shallow. **Smith's Creek** is half a mile above Woodbridge,—the land between them being low, nearly level and under cultivation; and thence to **Tuft's Point**, just beyond Smoking Point, the banks are marshy, with a cultivated and well settled country in the background.

On the Staten Island shore, a little over half a mile to the eastward of Smoking Point and directly opposite to Tuft's Point, is situated the village of **Rossville**; and one mile above this, on the same shore, the southern entrance to the shallow streams called The Fresh Kills. The entrance to these kills is divided into two channels by a marsh island about three-eighths of a mile in diameter; but neither is of any importance. A small settlement, known as **Woodbridge Neck**, is situated on the western bank, directly opposite the mouth of these kills.

On the western bank, a little over two miles above Tuft's Point and seven-eighths of a mile above the northern entrance to The Fresh Kills, is the mouth of a shallow stream called Rahway River, which leads to the town of **Rahway River**. **Rahway**, situated about four miles inland. The southern end of Prall's Island is about half a mile above this river; and thence as far as Elizabethport both shores are marshy, with alternate cleared and wooded lands in the background.

Arthur Kill is sometimes called **Staten Island Sound**. Its navigation is not safe without a pilot, as the dangers in it are not buoyed, and sailing vessels which have occasion to pass through it take a tow boat. The most dangerous obstruction in the creek is **Story's Flats**, with from one to three feet at low water, which make off from the western shore of Staten Island, between Story's Point and Smoking Point, for about six hundred and fifty yards. **Story's Point** is the cleared and well settled point directly opposite to Smith's Creek. To avoid these flats you must, when abreast of the mouth of Woodbridge Creek, keep the western shore aboard until you come up with Tuft's Point; but no intelligible sailing directions can be given for the creek,—its mouth also being obstructed by **Ferry Point Flats**, **Wards Point Flats**, and a *dangerous middle ground, with ten feet*, lying midway between the two points.

RARITAN BAY AND RIVER.

A full description of the shores of Raritan Bay will be found on pages 556-557. Raritan River, as before mentioned, makes into the western end of Raritan Bay just to the southward of Arthur Kill,—its entrance being eleven hundred yards wide, between **Ferry Point** on the north and the Camden and Amboy Railroad Docks on the south. It takes its rise in the western part of the State of New Jersey, but is of little importance beyond **New Brunswick**, (which is about thirteen miles above its mouth,) and all communication above this point is carried on by canal. Not more than thirteen feet at low water can be taken across the bar at its mouth; and just above **South Amboy** it is crossed by a drawbridge carrying the Central Railroad of New Jersey. No sailing directions can be given for it, and the navigation is almost entirely confined to steam and canal boats.

DANGERS

IN APPROACHING AND ENTERING RARITAN BAY AND RIVER.

Having come in by the Main Channel past Sandy Hook Point, if bound into Raritan Bay the course leads to the westward towards Princess Bay Light-house, passing close to the red can-buoy (with perch and ball) off Southwest Spit. It also leads close to the two large buoys off Sandy Hook Bay which mark the Navy Trial Course,—and navigators must not mistake these buoys for danger buoys. They are in the best water, (from four to four and three-quarter fathoms,) and are placed **W NW.** and **E SE.** from each other, two miles apart. When up with the westernmost of these buoys

Point Comfort Shoal. There will be seen, bearing about **W. $\frac{3}{4}$ S.** and a little over a mile off, a black spar-buoy. This is on the northern end of Point Comfort Shoal, which has five and six feet upon it, and extends from Point Comfort to the northward one mile and three-quarters. The buoy, which is marked No. 1, is placed in three and a half fathoms, and bears from Southwest Spit buoy **W. by N. $\frac{1}{4}$ N.**, distant four miles and three-eighths, and from Sandy Hook Light-house **W. by N. $\frac{1}{8}$ N.**, distant five miles and three-quarters. From this buoy Princess Bay Light-house bears **NW. by W. $\frac{3}{4}$ W.**, distant four miles and a quarter. To avoid this shoal in beating do not stand to the southward of Princess Bay Light-house bearing **W NW.**

If standing to the northward on a wind, between Point Comfort and Old Orchard Point, beware of Old Orchard Shoal, making off from that point to the southward for one mile and an eighth with from three to six feet water. A red can-buoy* of the second class, marked No. 2, is placed off its southern end in sixteen feet, bearing from West Beacon (which will be in range with Sandy Hook Light-house) **NW. $\frac{1}{2}$ W.**, distant five and a half miles, and from Point Comfort Shoal buoy **N. by E. $\frac{1}{4}$ E.**, distant one mile and seven-eighths. Princess Bay Light-house bears from this buoy **W. $\frac{1}{4}$ N.**, distant four miles and three-eighths, and the red buoy on Great Kills Flats **W. $\frac{1}{4}$ S.**, distant one mile and five-eighths.

To avoid Old Orchard Shoal do not stand to the northward of Princess Bay Light-house bearing **W. $\frac{1}{4}$ N.**

THE FOLLOWING INFORMATION WAS RECEIVED AFTER THIS VOLUME HAD GONE TO PRESS:

The Light-house Board has given notice that, on and after November 15, 1880, a fixed red light, of the fourth order of Fresnel, (illuminating the entire horizon,) will be shown from the new light-house erected on Great Beds, Raritan Bay. The tower is of iron, forty-two feet high, standing on an iron pier filled with concrete,—both tower and pier being painted red. The light has an elevation of fifty-seven feet above mean low water and should be visible, in clear weather, at a distance of thirteen miles. The lantern is painted black. The light-house is situated at the extreme southeastern end of Great Beds, (sometimes called **Ferry Point Flats**,) a long shoal making off from Ferry Point for about one mile with a depth upon it of from three to ten feet. The tower marks the dividing point of the channel leading from Raritan Bay,—vessels intending to enter Raritan River passing to the southward of it, close to, and heading up for the Camden and Amboy Railroad Docks; and those bound for Arthur Kill passing to the eastward of it, between it and the red buoy on the southwestern end of Ward's Point Flats. A **W. $\frac{1}{2}$ N.** course for the light-house will lead across the flats, carrying not less than eleven feet at mean low water.

The geographical position of Great Beds Light-house is (approximately)

Latitude $40^{\circ} 29' 9''$ N.
Longitude $74^{\circ} 15' 20''$ W.

On the southern side of the bay, when in the vicinity of Conaskonk Point, look out for a black nun-buoy* about two miles and a half to the westward of Point Comfort Shoal buoy. This is on Conaskonk Point Flats, (with from three to eight feet upon them,) making off from Conaskonk Point to the northward for one mile and three-eighths. The buoy, which is marked No. 3, is placed in twelve feet; but there is a *twelve feet lump* six hundred yards to the northeastward of it, so that vessels drawing more than ten feet should not approach the buoy nearer than half a mile. The ordinary sailing-line passes one mile and a quarter to the northward of these flats, so that they are dangerous only to vessels beating in or out. The buoy bears from Point Comfort Shoal buoy **W. $\frac{1}{4}$ N.**, two miles and three eighths, and from the middle of Conaskonk Point **N. $\frac{3}{8}$ E.**, one mile and three-eighths distant. To avoid the shoal on the southerly tack go about as soon as Princess Bay Light-house bears **NW.** by **W.** **Conaskonk Point Flats.**

On the northern side of the bay, a little over one mile and a half to the westward of Old Orchard Shoal buoy, will be seen a red spar-buoy. This is on the southern end of Great Kills Flats, making off from the mouth of Great Kills in a southwesterly direction for one mile and five-eighths,—their southern edge being one mile and an eighth from the nearest part of Staten Island. They are in places bare at low water and have eight feet at the distance of one mile from shore. The buoy is in twelve feet, is marked No. 4, and bears from Old Orchard Shoal buoy **W. $\frac{1}{4}$ S.**, distant one mile and five-eighths; from Old Orchard Point **SW. $\frac{1}{4}$ S.**, the same distance; and from Point Comfort Shoal buoy **NW.** by **N. $\frac{1}{4}$ N.**, distant two miles. The sailing-line passes five-eighths of a mile to the southward of it. **Great Kills Flats.**

Continuing to the westward towards Princess Bay, navigators must remember that the whole of the southern part of Raritan Bay is occupied by the great Raritan Flats, which fill the bight between South Amboy and Conaskonk Point and have in no place more than eleven feet upon them,—the prevailing soundings being seven, eight and nine feet. It is, therefore, dangerous to stand to the southward, when once to the westward of Conaskonk Point, unless the vessel be of less draught than seven feet. The flats, by a long spur on their northern side, join Round Shoal to the northward, which extends to within three-eighths of a mile of the Staten Island shore,—thus leaving for vessels of twelve feet draught or more a channel only three hundred yards wide. **Raritan Flats.**

Round Shoal is a sort of middle ground with from seven to ten feet upon it, and lies to the southward of Princess Bay. It is somewhat triangular in shape, one mile and a quarter long **N.** and **S.**, and its greatest width **E.** and **W.** is also one mile and a quarter; but at its southern end it is only about two hundred yards wide. On its northern point, about midway between Seguine Point and Princess Bay Light-house, is placed in twelve feet a black spar-buoy to mark the southern side of the channel. It is plainly visible from abreast of Seguine Point—bearing about **W. $\frac{3}{4}$ S.** and half a mile off;—and as soon as the point is abeam the buoy should be steered for. It should receive a berth to the southward of not less than fifty yards; and when past it the course turns to the southwestward,—leading through a narrow channel, between the Staten Island shore and the western side of Round Shoal, to Ward's Point. **Round Shoal.**

This is a very difficult part of the passage, and strangers must not attempt to go to the westward of Princess Bay Light-house. No intelligible rules can be given for avoiding the flats where they are not buoyed, and there are no buoys until you come to Ward's Point Shoal. This shoal makes off from Ward's Point—the southwestern end of Staten Island—for five-eighths of a mile to the southward and has from one to eleven feet upon it. Seven feet is found three-eighths of a mile, and eleven feet half a mile from shore. A red spar-buoy (No. 6) is placed on its southwestern end as a guide to Perth Amboy and Arthur Kill; and between six and seven hundred yards to the westward of this another red spar (No. 8) will be seen. This is on the southeastern end of Ferry Point Flats, which make to the southeastward from the western point of entrance to Arthur Kill for about one mile, and have three feet upon them half a mile, and five feet three-quarters of a mile from the point. Here the channel divides,—those vessels which are bound to Perth Amboy passing to the eastward of these flats, (between them and Ward's Point,) while those vessels bound into Raritan River pass to the southward of the buoy, close-to, with thirteen feet water. The channel hence to the mouth of the Raritan is unobstructed except by the flats on both sides. The best water is close to the South Amboy Docks, and thence in a direct line to the "draw" in the railroad bridge. **Ward's Point Shoal.**

Ferry Point Flats.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING RARITAN BAY AND RIVER.

On the **W.** by **S. $\frac{1}{4}$ S.** course through the Main Channel, (see page 564,) as soon as the Hook Beacon and West Beacon come in range on a bearing of **S. $\frac{1}{2}$ W.** Westerly and you have just passed the black buoy off the pitch of the Hook, steer **W. $\frac{1}{4}$ S.**, which will lead with not less than five and a quarter fathoms up to the Southwest Spit buoy, (perch and ball.) From this buoy steer **W NW.**, having Princess Bay Light-house a little to the southward of the course, passing to the northward of

Sailing Directions--Raritan Bay. the Navy Trial Course buoys, close-to, and carrying not less than four fathoms, until you come abreast of the red spar-buoy on Great Kills Flats. Continue the course, carrying not less than fifteen feet, until abreast of Seguine Point, in six fathoms, with Princess Bay Light-house bearing **W. $\frac{1}{2}$ N. Northerly**, distant seven-eighths of a mile, and the black buoy on the northern end of Round Shoal **W. $\frac{3}{4}$ S.**, about half a mile; when steer for the latter, aiming to pass about fifty yards to the northward of it. On this course you will not have less than three and a half fathoms. When fairly between this buoy and the light-house, in about fourteen fathoms, steer **SW. $\frac{3}{4}$ W.** for one mile and seven-eighths, carrying not less than eighteen feet. On this course, when the wharves on the western end of Ward's Point bear **NW. $\frac{1}{4}$ N.**, distant one mile, and the red buoy on the southeastern end of Ferry Point Flats bears **W. by N. $\frac{1}{2}$ N.**, distant three-quarters of a mile, steer **W. by N.** if bound into Raritan River, or **NW. by W. $\frac{3}{4}$ W.** if bound to Perth Amboy and Arthur Kill. *In the former case* keep the red buoy on Ferry Point Flats a little open to the northward of the course, pass about fifty yards to the southward of it, and steer **W. by S. $\frac{3}{4}$ S.** for a quarter of a mile, carrying thirteen feet. As soon as the "draw" in the railroad bridge bears **NW. $\frac{3}{4}$ N.** and you are about three-quarters of a mile from the South Amboy shore, steer **NW. $\frac{1}{2}$ N.**, which will carry the best water. When past the railroad docks steer for the "draw."

If bound into Arthur Kill.—Continue the **NW. by W. $\frac{3}{4}$ W.** course for half a mile until up with the red buoy on Ward's Point Shoal, carrying not less than three fathoms. When abreast of this buoy steer **N. $\frac{3}{4}$ W.** for the wharves on the western end of Ward's Point, carrying sixteen feet. Pass close to these wharves, and *if bound to Perth Amboy* keep the eastern shore aboard until half a mile above the point, when you may steer over towards the wharf-lip of the town.

The above courses pass one mile and a half to the southward of the red buoy on Old Orchard Shoal; over half a mile to the northward of the black buoy on Point Comfort Shoal; five-eighths of a mile to the southward of the red buoy on Great Kills Flats; one mile and three-eighths to the northward of the black buoy on Conaskonk Point Flats; two hundred and fifty yards to the southward of Seguine Point; fifty yards to the northward of the black buoy on Round Shoal; an eighth of a mile to the southward of the red buoy on Ward's Point Shoal; and one hundred yards to the southward of the red buoy on Ferry Point Flats. *Bound into Arthur Kill* they pass fifty yards to the westward of the red buoy on Ward's Point Shoal and four hundred yards to the eastward of the eastern edge of Ferry Point Flats.

Vessels of ten feet draught may, when up with the westernmost buoy of the Navy Trial Course, steer **W. $\frac{1}{2}$ N.**, (crossing the flats in not less than twelve feet,) and continue this course until past the buoy on Ferry Point Flats, with the "draw" in the railroad bridge bearing **NW. $\frac{3}{4}$ N.**, and they are about three-quarters of a mile from the South Amboy shore. Hence the course is **NW. $\frac{1}{2}$ N.** until past the railroad docks, after which the channel runs directly towards the "draw."

But if bound into Arthur Kill a vessel of ten feet draught should, when on the **W. $\frac{1}{2}$ N.** course the wharves on the western end of Ward's Point bear **NW. $\frac{1}{4}$ N.**, distant one mile, steer **NW. by W. $\frac{3}{4}$ W.** for half a mile, until up with the red buoy on Ward's Point Shoal. Passing this buoy on its western side close-to, they should steer for Ward's Point wharves and follow the directions given above for Perth Amboy.

The above courses pass a quarter of a mile to the northward of the black buoy on Point Comfort Shoal; six hundred yards to the northward of the black buoy on Conaskonk Point Flats; a quarter of a mile to the southward of Ward's Point Shoal buoy; and three hundred yards to the southward of the red buoy on Ferry Point Flats.

Wishing to make an anchorage in Sandy Hook Bay, round the northern point of the Hook at a distance of three-eighths of a mile and steer boldly into the bay,—there being no dangers. You may skirt the western shore of the Hook to the southward as far as **Horse-Shoe Cove** at a distance of three-eighths of a mile with not less than four fathoms; but on reaching the northern point of this cove (which is marked by a large railroad wharf,—the northern terminus of the Long Branch Railroad) you must keep about five-eighths of a mile from the shore, as there is *a dangerous shoal with from three to seven feet upon it making off for six hundred yards.*

Sandy Hook Bay is not safe anchorage in **N., NE., or NW.** winds, as a heavy sea gets up rapidly under these circumstances and vessels are in danger of dragging their anchors and going ashore. In **E SE. and S.** winds there is fine and smooth shelter.

NEWARK BAY.

Newark Bay, as before mentioned, is connected with the Upper Bay of New York by **Kill Van Kull**,—a full description of the latter being given on pages 558–559. The direction of the bay is **NE.** by **N.** and **SW.** by **S.**, its length about four miles and three-quarters and its average width one mile and a quarter, with a depth in the channel of about six feet. At its northern end it receives the waters of the **Hackensack** and **Passaic** rivers,—the former taking its rise in **Rockland Lake** about eighteen miles above the northern end of New York city, and the latter rising in Somerset County (Central New Jersey) and flowing through a very tortuous channel, which in turn follows all the points of the compass until it finally empties into Newark Bay, at its north-western end.

The eastern shore of the bay is formed by **Bergen Neck** and shows a nearly level country, in no place more than forty feet high, for the most part well settled and diversified with alternate woods and cultivated fields. The western shore is formed entirely by the famous **Newark Marshes**, which are, however, being rapidly reclaimed and will in a few years present an uninterrupted line of level cultivated fields.

The **Passaic River** at its mouth is about six hundred yards wide, but gradually contracts until, abreast of the city of Newark, it is but one hundred yards in width. Its course from the entrance is first a little to the eastward of **N.** by **E.** for about one mile and three-eighths, and then nearly **W.** for about one mile to the town of **Newark**. Beyond Newark it turns again to the northward, running about eight miles to the village of **Passaic**; then continuing to the northward for six miles to **Rochdale**; and then to the southwestward for two miles to **Paterson**. There is no navigation beyond Paterson, but the town has a communication by the **Morris Canal** with both New York Bay and Delaware River. Newark **Passaic River.** is the largest city in the State of New Jersey,—having a population of one hundred and twenty-five thousand,—and is principally distinguished for its manufacturing interests, which consist of jewelry, india-rubber goods, carriages, harness, clothing, and boots and shoes. Not more than six feet at low water can, however, be taken up to the city,—its products being transported mainly by the railways. Paterson is famous for its cotton and silk factories; but there are also machine shops, which manufacture locomotives, carriages, guns, paper and other articles. It has a population of about thirty-nine thousand and is rapidly increasing. There is no navigation above this town on account of the falls, which have a drop, perpendicular, of fifty feet.

The **Hackensack River** is, at present, of no commercial importance.

The eastern point of entrance to Newark Bay is marked by **Bergen Point Light-house**, a grey stone tower attached to a wooden dwelling, standing in the water about four hundred yards **W SW.** from Bergen Point. This tower is on the southwestern end of **Bergen Point Reef** (which has from two to three feet upon it) and shows a fixed white light, of the sixth order, from a height of forty-eight feet above the sea, visible eleven miles. **Bergen Point Light-house.** In thick weather a bell is struck by machinery once in every fifteen seconds.

Half a mile **W.** $\frac{1}{4}$ **N.** from Bergen Point Light-house is **Shooter's Island**, a marshy island about two hundred and fifty yards in diameter, with a few trees on its northern and western sides and some houses and a wharf on its southern side. There is a large stake near the northern end of the island. Vessels bound to Elizabethport pass to the southward of this island, between it and the wharf-line of North Shore village; and when past the wharf on the southern side of the former will perceive a large stake or pile bearing about **NW.** by **N.** and half a mile off. This stake carries at night a lens lantern known as **Corner Stake Light**, which shows a fixed red light as a guide to warn vessels off the **Corner Stake Flats** and to mark the turning point in the channel to Elizabethport. **Shooter's Island.**

Nearly three-quarters of a mile to the northward of Bergen Point Light-house Newark Bay is crossed by a bridge carrying the Central Railroad of New Jersey, which here crosses to Bergen Neck and terminates at the Communipaw Docks, just below Jersey City. When vessels have passed through the draw in this bridge they will see to the northward, about two miles and a half off and on the western side of the bay, a grey tower attached to a dwelling of the same color with brown trimmings; and just to the northward of it a wooden beacon, painted black and red, standing on a stone pier. The light-house is known as **Passaic Light-house**, bears from Bergen Point Light-house **NE.** by **N.** $\frac{1}{4}$ **N.**, a little over three miles and a quarter distant, and shows a fixed white light, of the sixth order, from a height of forty-eight feet above the sea, visible eleven miles. It is situated upon the eastern edge of the **Passaic Flats**, which have from one to two feet upon them, and extend off the Newark Marshes at distances varying from half a mile to twelve hundred yards. The best water is carried by giving the light-house a berth to the westward of not less than a quarter of a mile. **Passaic Light-house.**

The beacon above mentioned is known as **Elbow Beacon**,—being at the point of junction of the Passaic and Hackensack channels and marking the turning point in the channel leading into the Passaic River. It is three-eighths of a mile **NE.** $\frac{1}{4}$ **N.** from the Passaic Light-house and three miles and five-eighths **NE.** by **N.** $\frac{1}{4}$ **N.** from Bergen Point Light-house. It supports a fixed white light, of the sixth order, twenty-seven feet above the sea, and visible six miles. Above and beyond it there are no light-houses, although the channel is pretty well buoyed as far up as the railroad bridge. **Elbow Beacon.**

About seven hundred yards above its mouth the Passaic is crossed by a railroad bridge carrying the New York and Newark Railroad. About five-eighths of a mile above this it is crossed by another bridge, and at the city of Newark itself by several others carrying the various railroads leading to New York. Of course neither bay nor river is navigable without a pilot.

DANGERS

IN APPROACHING AND ENTERING KILL VAN KULL AND NEWARK BAY.

When abreast of Tompkinsville, on the N. by W. course for Robbins' Reef Light-house, a red can-buoy will be seen nearly abeam to the eastward. This is off the southwestern end of Gowanus Flats, before described (on page 563) as making off from Red Hook to the southwestward for two miles and an eighth. They have not less than ten feet upon them, and near the buoy eighteen feet. The buoy is in four and a half fathoms and marked No. 18; and should it be made close-to, Robbins' Reef Light-house will bear NW. by N. $\frac{1}{2}$ N., distant one mile and an eighth, and Constable's Point (the northern point of entrance to Kill Van Kull) NW. by W. $\frac{1}{2}$ W., distant one mile and seven-eighths.

Robbins' Reef, on the northern side of the approach to Kill Van Kull, is the southeastern extremity of the *Jersey Flats*, has from five to ten feet water upon it, and is sufficiently well marked by the light-house and also by a black nun-buoy* (No. 17) placed about a quarter of a mile to the southward of the light-house in three fathoms. This buoy bears from the red can off Gowanus Flats NW. by N. Northerly, seven-eighths of a mile; and Mill Reef Beacon bears from it W. $\frac{1}{4}$ S., a little over a mile and a quarter distant.

Mill Reef is the next danger met with, and is off Constable's Point, on the northern side of the entrance. It is a rocky ledge making to the southward for two hundred and fifty yards, and near its southern end is marked by a beacon. This beacon is in the form of a cone, of iron, rising from a granite base, and supporting an iron shaft and cage. It should receive a berth to the northward of not less than one hundred yards. It bears from Robbins' Reef Light-house W. by S. $\frac{1}{4}$ S. Nearly, distant a little over one mile and a quarter, and from Robbins' Reef buoy W. $\frac{1}{4}$ S., about the same distance.

When past it there are no dangers—both shores being bold-to—until you approach Port Richmond, when you must look out, on the northern side of the passage and off the village of Bergen Point, for a red spar-buoy (No. 2) which marks the southern end of a reef with from six to nine feet water making off from the Bergen shore. This buoy is placed in twelve feet a little over two hundred yards from shore,—Bergen Point Light-house bearing W. $\frac{1}{4}$ S., distant nearly half a mile. It may be safely passed within one hundred yards with not less than four fathoms; and when past it Bergen Point Light-house must receive a berth to the northward of about one hundred and fifty yards. This light-house is built near the western end of *Bergen Point Reef*, which has from two to three feet upon it, and extends about a quarter of a mile WSW. from Bergen Point.

When up with the light-house, if bound to Elizabethport or into Arthur Kill, the course continues to the westward towards Shooter's Island, a low, flat, marshy island, (already described on page 591.) which has a large stake erected near its northern end. The channel passes to the southward of this island, between it and the village of North Shore; and vessels must be careful, in approaching it, not to go to the northward of Bergen Point Light-house bearing E. by N. $\frac{1}{4}$ N., as there is a three feet lump four hundred yards E. $\frac{1}{4}$ S. from the wharf at its southern end. When past Shooter's Island the course turns to the northwestward towards Corner Stake Light, passing between the dangerous Elizabethport Flats on the north and *Corner Stake Flats* on the south. The channel is in no place more than one hundred and fifty yards wide with not more than eleven feet in it. When up with Corner Stake Light the course changes to the westward,—leading directly for the village with not less than nine feet water; but no description of the dangers will enable a stranger to enter, as the flats are not buoyed.

If bound to Newark, the channel turns abruptly to the northward at Bergen Point Light-house, passing within one hundred and fifty yards of the light so as to avoid Bergen Middle Ground, a long narrow shoal having from eleven to thirteen feet upon it, extending N. and S. for between six and seven hundred yards,—its southern end being about one-eighth of a mile W. from the light-house, with deep water on all sides of it. It is not buoyed, but should be, as the channel is very narrow.

Half a mile above the light-house and about three hundred and fifty yards to the northward of the northern end of the Middle Ground will be seen a black spar-buoy about a quarter of a mile below the railroad bridge. This is on the northeastern end of the Elizabethport Flats,—the name given to that portion of the flats making off from the western shore which lie below the bridge. They have from three to five feet upon them, and extend to the southeastward to Shooter's Island and to the northeastward one mile from the Elizabethport shore. The buoy, which is marked No. 1, is placed in three fathoms, and bears from Bergen Point Light-house N. $\frac{1}{4}$ W., half a mile. From this buoy the "draw" in the bridge bears NE. $\frac{1}{4}$ E. Directly opposite buoy No. 1 is a red spar-buoy (No. 4), which is placed on the western side of a five feet spot and marks the eastern limits of the channel.

Above the bridge vessels must not go without a pilot. The great Passaic Flats on the west, which extend off the Newark Marshes an average distance of nine hundred yards with from one to two feet water, and the Bergen Flats, extending from Bergen Neck to distances varying from an eighth to three-quarters of a mile with from two to four feet water, rendering the navigation extremely hazardous. Not more than seven feet at low water can be taken

Passaic and Bergen Flats.

up to Passaic Light-house and not more than six feet into the Passaic River. There are also several lamps in mid-channel with from four to six feet upon them, none of which are buoyed, except in the channel above the light-house, where are placed two black spar-buoys (Nos. 3 and 5), marking the western side of the channel. Ten feet can be taken into Hackensack River after passing the light-house.

SAILING DIRECTIONS

FOR APPROACHING AND ENTERING KILL VAN KULL AND NEWARK BAY.

On the N. by W. course from The Narrows towards Robbins' Reef Light-house, when abreast of Tompkinsville, with Constable's Point bearing NW. by W. $\frac{1}{2}$ W. Westerly, distant one mile and three-eighths, steer for that point for seven-eighths of a mile, carrying not less than four and a half fathoms. When within half a mile of the point, with Robbins' Reef Light-house bearing NE. by E. $\frac{5}{8}$ E. and Mill Reef Beacon W. Northerly, steer W., aiming to pass about one hundred yards to the southward of the beacon. When past it keep the middle of the passage until to the westward of the red spar-buoy (No. 2) off Bergen Point Village. When abreast of Bergen Point Light-house, *if bound to Elizabethport*, steer about W. $\frac{1}{2}$ N. so as to pass midway between Shooter's Island and the Staten Island shore and carry not less than ten feet water. When past the island, with Corner Stake Light bearing NW. by N. $\frac{3}{8}$ N., nine hundred yards distant, steer for that light, aiming, however, to pass about one hundred yards to the eastward of it. Round the light to the westward, keeping about one hundred yards off, and steer about W. $\frac{1}{4}$ N. for the Elizabethport wharves, carrying not less than nine feet water.

The above courses pass three-eighths of a mile to the westward of the red buoy on Gowanus Flats; the same distance to the southward of the black buoy on the southern end of Robbins' Reef; half a mile to the southward of Robbins' Reef Light-house; one hundred yards to the southward of Mill Reef Beacon; one hundred yards to the southward of the red spar-buoy (No. 2) off Bergen Point Village; three hundred yards to the southward of Bergen Point Light-house; seventy-five yards to the southward of the wharf on the southern end of Shooter's Island; and one hundred yards to the eastward and the same distance to the northward of Corner Stake Flats.

If bound into Newark Bay.—When abreast of Bergen Point Light-house, as before, round it to the westward at one hundred yards distance and steer N. by E. $\frac{1}{4}$ E., which will lead with not less than nineteen feet to abreast of the black buoy on the northeastern end of the Elizabethport Flats. When up with this buoy, in four and a half fathoms, steer for the "draw" in the bridge,—above which you must take a pilot.

These courses pass one hundred yards to the eastward of the southern end of Bergen Middle Ground; two hundred yards to the eastward of the northern end of that shoal; and one hundred and fifty yards to the eastward of the black buoy on the Elizabethport Flats.

Coming from New York or from the East River.—On the SW. by S. course from off The Battery, when Robbins' Reef Light-house bears NW. $\frac{7}{8}$ W., distant half a mile, and Mill Reef Beacon W. Southerly, distant a mile and five-eighths, steer W. $\frac{1}{8}$ S., aiming to pass one hundred yards to the southward of the beacon; after which follow the directions given above.

The above courses pass three-eighths of a mile to the eastward of Robbins' Reef; one hundred yards to the southward of the black buoy on the southern end of that reef; and one hundred yards to the southward of Mill Reef Beacon.

LIGHT-HOUSES IN NEWARK BAY.

NAME.	Latitude.	Longitude West.			Fixed or Revolving.	Height above sea-level.	Distance visible in nautical miles.
		In arc.		In time.			
	° ' "	° ' "	h. m. s.		Fect.		
Bergen Point Light-house	40 38 32	74 8 56	4 56 35.8	Fixed.	48	11	
Corner Stake Beacon	40 38 44	74 9 47	4 56 38.6	Fixed red.	—	—	
Passaic Light-house	40 41 44	74 7 40	4 56 30.7	Fixed.	48	11	
Elbow Beacon	40 42 6	74 7 29	4 56 29.9	Fixed.	27	6	

LIGHT-HOUSES.

NAME.	Latitude.			Longitude West.				Fixed or Revolving.	Interval of Flash.	Height above sea-level.	Distance visible in nautical miles.		
				In arc.		In time.							
	°	'	"	°	'	"	h.					m.	s.	m.	s.	Feet.
Navesink Light-houses { N.-----	40	23	45	73	59	11	4	55	56.7	Fixed.	-----	248	22.6
{ S.-----	40	23	43	73	59	10	4	55	56.6	Fixed.	-----	248	22.6
Sandy Hook Light-house-----	40	27	40	74	0	9	4	56	0.6	Fixed.	-----	90	15.3
Hook Beacon-----	40	28	16	74	0	27	4	56	1.8	Fixed.	-----	46	11.0
West Beacon-----	40	27	48	74	0	27	4	56	1.8	Fixed.	-----	45	11.1
Conover Beacon-----	40	25	14	74	3	22	4	56	13.5	Fixed.	-----	60	13.2
Chapel Hill Beacon-----	40	23	51	74	3	34	4	56	14.2	Fixed.	-----	224	21.6
Bayside Beacon-----	40	26	51	74	7	18	4	56	29.2	Fixed.	-----	45	12.0
Wilson's Beacon-----	40	26	36	74	8	12	4	56	32.8	Fixed.	-----	76	14.4
Princess Bay Light-house-----	40	30	25	74	12	50	4	56	51.4	F. V. F.	2 0	106	16.2
Elm Tree Beacon-----	40	33	46	74	5	47	4	56	23.1	Fixed.	-----	62	12.0
New Dorp Beacon-----	40	34	48	74	7	14	4	56	29.0	Fixed.	-----	192	20.2
Fort Tompkins Light-house-----	40	36	4	74	3	17	4	56	13.1	Fixed.	-----	90	15.2
Robbins' Reef Light-house-----	40	39	24	74	3	58	4	56	15.8	Fixed.	-----	58	13.7
Bergen Point Light-house-----	40	38	32	74	8	56	4	56	35.8	Fixed.	-----	48	11.0
Corner Stake Beacon-----	40	38	44	74	9	47	4	56	38.6	Fixed Red.	-----	-----	-----
Passaic Light-house-----	40	41	44	74	7	40	4	56	30.7	Fixed.	-----	48	11.0
Elbow Beacon-----	40	42	6	74	7	29	4	56	29.9	Fixed.	-----	27	6.0

TIDES.

	Sandy Hook.	Governor's Island.
Corrected Establishment-----	7 ^h 29 ^m	8 ^h 13 ^m
Mean Rise and Fall of tides-----	4.8 ft.	4.3 ft.
Mean Rise and Fall of Spring tides-----	5.6 ft.	5.4 ft.
Mean Rise and Fall of Neap tides-----	4.0 ft.	3.4 ft.
Mean duration of Rise-----	6 ^h 10 ^m	6 ^h 0 ^m
Mean duration of Fall-----	6 ^h 15 ^m	6 ^h 25 ^m
Mean duration of Stand-----	0 ^h 21 ^m	0 ^h 23 ^m
Rise of highest tide observed-----	7.1 ft.	6.3 ft.

CURRENTS.

To the northward of Sandy Hook Light-vessel and between East Bank and Rockaway Inlet the strength of the flood sets about NW. by N. $\frac{1}{2}$ N. with a velocity of about half a mile; while the ebb sets about SE. by E. with a rate of one mile and a half per hour.

In Gedney's Channel, between Sandy Hook Light-vessel and the southeastern end of Romer Shoal, the flood sets about NW. by N. $\frac{1}{2}$ N. with a velocity of one mile; and the ebb SE. $\frac{1}{2}$ S. with the same velocity.

In the False Hook Channel the strength of the flood sets N. by W. and that of the ebb S. by E. with a velocity of two miles an hour. This set is almost exactly along the beach,—having no tendency either on or off shore.

In the East Channel, on the southern side of East Bank, the strength of the flood current sets nearly due N. (or directly on to the East Bank) with a velocity of one mile and a half; while the ebb sets SE. by E. $\frac{1}{2}$ E. (or nearly in the direction of the channel) with a velocity of two miles and a quarter per hour.

The following table, prepared under the direction of the Superintendent of the Coast Survey, shows the set, drift and time of the current at important points in the harbor:

THE TIMES OF THE CURRENT AND OF THE TIDE ARE GIVEN IN HOURS AND MINUTES AFTER THE MOON'S TRANSIT. (SOUTHING.)

No.	STATIONS—LOCALITY.	Strength of Flood Current.			Strength of Ebb Current.			Current reaches its strength before or after high water at Sandy Hook.		Slack Water.	
		Set.	Drift.	Time.	Set.	Drift.	Time.	Flood.	Ebb.	Between Flood and Ebb.	Between Ebb and Flood.
1	Main Channel, two miles NE. from Sandy Hook Light-house.	NW. by W. $\frac{1}{2}$ W.	2.0	5 0	E. $\frac{1}{2}$ S.	2.9	11 15	1 27 before.	4 49 after.	8 12	1 57
2	In The Narrows-----	NE. by N. $\frac{1}{2}$ N.	1.1	6 57	S. $\frac{1}{2}$ W.	1.8	13 10	0 4 after.	6 3 after.	10 7	3 54
3	Entrance to Buttermilk Channel.	NE. by N. $\frac{1}{2}$ N.	1.4	-----	S. $\frac{1}{2}$ W.	1.8	-----	-----	-----	-----	-----
4	Buttermilk Channel,—between Governor's Island and Brooklyn.	NE. $\frac{1}{2}$ E.	2.0	6 33	SW. West'y	1.6	12 38	-----	-----	9 35	3 50
5	Off Eighty-sixth Street.	ENE.	0.5	-----	S. $\frac{1}{2}$ W.	1.6	-----	1 13 after	7 34 after.	-----	-----

NEW YORK BAY AND HARBOR.

595

LIFE-SAVING STATIONS BETWEEN NANTUCKET AND NEW YORK.

The United States Government has established along the coast, at short intervals, houses of refuge and stations furnished with life-boats, life-cars, mortars and all other appliances for saving life and affording assistance in case of wrecks. There are many of these on the coast of Long Island and also on the Jersey beach, and their positions are given in the following list:

LOCALITY.	LATITUDE.			LONGITUDE.		
	°	'	"	°	'	"
Surf-Side (South coast of Nantucket Island)	41	14	30	70	4	0
Near Block Island Basin	41	10	20	71	33	0
Southwestern end of Block Island	41	9	30	71	36	0
Montauk Point	41	4	15	71	51	5
Two miles to the westward of Montauk Point	41	3	0	71	53	10
Five and a half miles to the westward of Montauk Point	41	1	50	71	57	35
About nine miles to the westward of Montauk Point	41	0	0	72	1	20
On the beach near Amagansett	40	58	30	72	6	0
Georgica, four miles to the westward of Amagansett	40	56	30	72	10	50
On the beach opposite Bridge Hampton	40	54	30	72	16	15
Seven miles to the eastward of Shinnecock Light-house	40	52	40	72	21	25
Three miles to the eastward of Shinnecock Light-house	40	51	0	72	25	35
Tiana, two miles to the westward of Shinnecock Light-house	40	49	20	72	31	15
Quogue, four and a half miles to the westward of Shinnecock Light-house	40	48	20	72	34	30
Eight miles to the westward of Shinnecock Light-house	40	47	10	72	38	50
Moriche's, on the south side of Moriche's Bay	40	46	0	72	42	40
Forge River, opposite the western end of Moriche's Bay	40	45	10	72	45	35
Opposite Smith's Point, Great South Bay	40	43	35	72	52	0
On beach opposite Bellport	40	42	0	72	57	10
On beach opposite Blue Point	40	41	0	73	0	20
Near The Head and Horns, Fire Island Beach	40	39	0	73	5	0
Three miles to the eastward of Fire Island Light-house	40	38	25	73	9	40
On the beach, close to Fire Island Light-house	40	37	30	73	13	50
Eastern end of Oak Island	40	38	11	73	16	40
Western end of Oak Island	40	36	50	73	23	30
Eastern end of Jones' Beach	40	36	35	73	25	30
Western end of Jones' Beach	40	35	15	73	30	0
Short Beach, half a mile to the eastward of Jones' Inlet	40	35	25	73	32	0
Meadow Island	40	36	0	73	33	0
Eastern end of Long Beach	40	35	10	73	34	35
Western end of Long Beach	40	35	0	73	39	40
Western end of Hog Island	40	35	30	73	43	10
Eastern end of Rockaway Beach	40	35	50	73	46	30
Western end of Rockaway Beach	40	34	20	73	50	20
Sheepshead Bay	40	34	30	73	55	10
On the beach, to the eastward of Sandy Hook Light-house	40	27	40	73	59	30
On the beach abreast of Spermaceti Cove, two and a quarter miles below Sandy Hook Light-house	40	24	0	73	58	20
On the beach at Seabright	40	21	25	73	58	25
Monmouth Beach, two and a quarter miles below Seabright	40	19	20	73	58	10
Long Branch	40	17	30	73	58	30
Deal, two and three-quarter miles below Long Branch Station	40	13	50	73	59	30
Shark River, two and three-quarter miles below Deal Station	40	11	25	74	0	30
Wreck Pond, two miles and an eighth below Shark River	40	8	12	74	1	30
On the beach opposite Squan Village	40	6	20	74	2	0
Point Pleasant, three miles below Squan Village	40	3	40	74	2	40
On beach at Swan Point, two miles and three-eighths below Point Pleasant	40	2	0	74	3	0
Green Island, two miles and a half below Swan Point	40	0	30	74	3	35
On beach opposite Tom's River	39	58	15	74	4	0
Island Beach, two miles and a half below Tom's River Station	39	55	40	74	4	45
On beach opposite Forked River, two and five-eighths miles below Island Beach	39	52	30	74	4	50
South end of Squan Beach	39	47	40	74	5	30
Barnegat (south side of Inlet)	39	45	40	74	6	0

HUDSON RIVER.

This great river takes its rise in one of the lakes in Essex County, in the northeastern part of New York, and flows in a southerly direction for about two hundred and sixty miles to its junction with the East River at the southern end of Manhattan Island, where they both enter the Upper Bay of New York. For a distance of about seventy-five miles above its mouth (or as far up as Rondout) it has a deep and unobstructed channel and is navigable for the largest vessels; while above Rondout the channel, though it has not less than four and a half fathoms as far up as Hudson City, is rendered more difficult of navigation by reason of numerous middle grounds and flats, which are very abrupt and are but partially buoyed. Hudson City is twenty-three miles above Rondout and nearly thirty-one miles below Troy, which is at the head of navigation.

Sailing vessels experience great difficulty and danger in navigating the Hudson owing to the numerous "tows," some of which are a quarter of a mile in length; and rather than run the risk of collisions almost all such vessels avail themselves of steam power. An immense carrying trade in merchandise of all kinds is possessed by the canal boats, which are towed up and down the river in great numbers—coal and ice being among the principal cargoes. There are also many important manufacturing cities and towns on the river banks, among which may be mentioned Yonkers, Tarrytown, Sing Sing, Nyack, Peekskill,

† Approximate position.

Newburgh, Poughkeepsie, Rondout, Catskill, Hudson City, New Baltimore, Albany and Troy,—the last named being about one hundred and thirty miles above the mouth of the river.

The western shore opposite to New York is occupied by **Jersey City**, the town of **Hoboken**, and the villages of **Weehawken** and **Guttenberg**. **New York** occupies nearly all of **Manhattan Island**, although the upper end of the island—say from about Jeffrey's Hook to Spuyten Duyvel Creek—is not yet laid out and is comparatively thinly settled. **Jersey City** and **Hoboken** are built upon the flat lands at the base of the **Bergen Highlands**, while **Hudson City** and **West Hoboken** are built on the heights. At **West Hoboken** the highlands begin to approach the river, showing steep, almost perpendicular faces; and **Guttenberg** and **Weehawken** are close to the bank, though considerably elevated above the tide. At **Guttenberg** the hills are between two and three hundred feet high. These hills on the western bank will appear in some places thickly wooded, and in others clear of trees and apparently barren. They are faced for the most part with marshy land, which has in some places been drained and cultivated; and these features continue with scarcely any variation nearly to **Fort Lee**, (seven miles above **Jersey City**,) where begin the famous **Palisades**.

The **Palisades** are perpendicular rocky cliffs of considerable height, (between three and five hundred feet,) in some places thickly wooded with scrub and in others bare and forbidding. They extend along the western bank from **Fort Lee** to **Piermont**, twelve miles above, (where is the terminus of the **New York and Erie Railroad**;) but their perpendicular faces are occasionally hidden by the thick scrub. At **Piermont** there is a very long wharf, belonging to the railroad company, extending into ten feet water, and having a lighted beacon on its end maintained by the company. On **The Palisades**, opposite to the mouth of **Spuyten Duyvel Creek**, there will be seen a large hotel with mansard roof. It forms a very conspicuous object, perched as it is on the extreme verge of the cliffs where they are about three hundred and fifty feet high.

On the eastern bank of the river, above **New York**, we find the upper part of **Manhattan Island** composed of moderately high land with somewhat steep slopes, for the most part thickly wooded, with handsome villas showing here and there among the trees. It presents a strong contrast to the western bank,—being almost entirely covered with ornamental grounds; while **The Palisades** are barren, rugged and desolate. As above remarked, the island is separated from the mainland on the north by **Spuyten Duyvel Creek**, a narrow, shallow and crooked stream which connects the **Harlem** and **Hudson** rivers. It is a quarter of a mile wide at its mouth, (where it is crossed by a bridge carrying the **Hudson River Railroad**,) but rapidly contracts to a width of fifty yards, and joins the **Harlem** by a very crooked and winding course.

Jeffrey's Hook, on this shore, is the site of **Fort Washington**, and is nearly opposite to but a little above **Fort Lee** on the western shore; and **Tubby Hook** is one mile and three-eighths above **Jeffrey's** and half a mile below **Spuyten Duyvel Creek**. There are landings at both places; but these and the other features of this bank will soon disappear as the city advances towards the upper end of the island.

From **Spuyten Duyvel Creek** to **Yonkers**, three miles above, the eastern bank presents a very beautiful appearance,—being composed entirely of ornamental grounds thickly studded with handsome villas. **Mount St. Vincent**, a Roman Catholic Seminary, is situated about one mile below **Yonkers**, and is easily recognized as a large and handsome building of red brick with a granite chapel in front of it. It is surrounded by beautiful grounds. **Riverdale**, a small settlement, is about one mile above **Spuyten Duyvel Creek** and the same distance below **Mount St. Vincent**.

Yonkers is a handsome town of about twenty thousand inhabitants, and when seen from the river presents a somewhat remarkable appearance, as its northern half is perched upon the slopes of a steep hill,—the houses rising above each other in regular ranks, so as to give a very pretty effect. There are quite a number of wharves here, and considerable business is done. Opposite to the town, on the western bank, are **Huyler's** and **Gloster** landings,—the former being five and a quarter and the latter six and a half miles above **Fort Lee**.

Two miles and a half above **Yonkers** is the village of **Hastings**, situated on rolling ground of moderate height, with a wharf-line nearly half a mile long. Between the village and **Yonkers** are steep wooded hills about three hundred and fifty feet high; but as **Hastings** is approached the land descends somewhat,—the site of the village being only about one hundred feet above high water at its highest point. Hence to **Tarrytown** the land, though rolling, is not nearly so high as that between **Hastings** and **Yonkers**.

Five-eighths of a mile above **Hastings** is the village of **Dobbs' Ferry**; and directly opposite to it, at the base of **The Palisades**, is **Sneden's Landing**, with a large wharf and a few houses situated on comparatively low land between two spurs of **The Palisades**. At **Dobbs' Ferry** the land rises gradually to a height of one hundred and eighty feet and is cleared and thickly settled. Here the river is about one mile wide. The heights are all well wooded.

Irvington is a small village nearly opposite to **Piermont** and a little over one mile above **Dobbs' Ferry**. The small settlement of **Abbottsford** lies just to the southward, but some distance back from the river. The land partakes of the same general character as that near **Hastings**,—being rolling, cleared and cultivated, thickly settled, and from one to two hundred feet high, with a gradual rise. Between the wharf-line of this village and the pier of the **Erie Railroad** at **Piermont** the river is about one mile wide.

On the western bank of the river at **Piermont** **The Palisades** cease, and high steeply sloping hills begin,—the slopes being diversified with woods and carefully cultivated fields. At the base of the hills the shore is thickly settled,—an almost unbroken line of houses extending nearly to **Nyaack**, which is about two miles and a half above. To the slight indentation in the shore



Verona Bay

Blair's Point

Capitank's Point

Harrocks

On Island's
Landing

View of Hoversay Bay, from off Scarborough.

line formed between Piermont and Nyack the name of **The Bight** has been given; and at its northern end is a small settlement of the same name. **Nyack** is about twenty-one miles above Jersey City and nearly opposite to Tarrytown.

It is a town of about five thousand inhabitants, situated in a sort of valley of comparatively low and gently **Verdrietege Hook**, sloping land between Piermont and Verdrietege Hook, or **Hook Mountain** as it is often called. This mountain is plainly visible from off Nyack, appearing high, precipitous, for the most part thickly wooded with scrub, but showing occasional bare precipitous cliffs cropping out on the river side. Its summit is between seven and eight hundred feet above the level of the river. From Piermont to the eastern pitch of the Hook the river has an average width of a little more than two miles for a length of six miles; and this wide reach is called **The Tappan Zee** or **Tappan Sea**. The channel is wide and unobstructed, except by the **Nyack Flats** and those off Kingsland's Point.

Tarrytown, on the eastern bank, opposite Nyack, is two miles above Irvington and about seven miles above Yonkers. It has a population of about fifteen thousand and is thriving and rapidly increasing in size. At its northern end is **Kingsland's Point**, which is low and nearly level and covered with a thick growth of very handsome trees. When seen from the southward this point appears like an island. **Sleepy Hollow**, famous in story, is situated about one mile and a quarter above Tarrytown and half a mile inland.*

Three miles above Kingsland's Point is situated the small settlement of **Scarborough**; and five-eighths of a mile above this the town of **Sing Sing**,—the southern suburb of which is known as **Sparta**. The shore between the two points is undulating,—the heights varying from seventy to two hundred and fifty feet,—with somewhat steep faces, and for the most part well wooded. Scarborough is situated some distance inland, but has a landing composed of several wharves. Sing Sing, noted for the State Penitentiary near it, is a beautiful town of about six thousand inhabitants, situated on the heights, which are here about two hundred feet high, and is famous for the excellence of its educational establishments. It is about twenty-eight miles above the mouth of the river. On the flat shore, at the base of the steep hills on which the town is built, will be seen a great number of thickly clustered white-looking buildings with wharves attached. These form the **New York State Penitentiary**, commonly known as **Sing Sing Prison**. Opposite to the town and just at the northern end of Verdrietege Hook is **Rockland Lake Landing**, easily recognized by the ice-barges which are always at its wharves, the ice-houses, and the great *chute* which leads from the lake level (about six hundred feet above) to the landing-place. There is quite a settlement here,—the houses being scattered along the slopes in a sort of valley or gorge between the steep cliffs of Verdrietege Hook and those to the northward which extend to Waldberg Landing.

Just above Sing Sing makes in a wide but shallow bay called Croton Bay, into which empties the **Croton River**. It is one mile and a quarter wide at its mouth, (between the Sing Sing shore on the east and Teller's Point on the west,) but gradually contracts until at its northern end, where the Croton River comes in, it is but three-eighths of a mile in width. **Croton Point** is a long peninsula, comparatively low and for the most part under cultivation, although there are in many places thick woods near the water. **Teller's Point**, its southern extremity, is about one mile and a half above Rockland Lake Landing and is the eastern point of entrance to that reach of the river which is locally known as **Haverstraw Bay**.

On the western shore, from **Rockland Lake Landing** to **Waldberg Landing**, (the western point of entrance to Haverstraw Bay,) the distance is about two miles and a quarter. The banks are high and very steep, rising to a height of from four to six hundred feet in a distance back from the shore of only about an eighth of a mile, and the western shore spreads away to the westward so as to form a sort of bay about three miles wide called Haverstraw Bay. The high lands gradually recede to the westward, terminating near the village of Haverstraw (one mile and a quarter above Waldberg Landing) in a hill known as **High Tor**, eight hundred feet above the river level. All of this shore is composed of densely wooded precipitous hills from four to six hundred feet high.

Haverstraw Bay, which is the second wide reach of the river, extends from Teller's Point to Stony Point,—a distance of about five miles, and is widest about midway of its length. At its southern end, between Teller's Point and the Waldberg shore, it is one mile and an eighth wide; at its northern end, opposite Stony Point, it is but three-quarters of a mile wide; and its greatest width, opposite the village of Haverstraw, is three miles and a quarter. The eastern shore of the bay, between Teller's Point and Cruger's, is occupied by flats, which in some places extend one mile and a half from shore with not more than nine feet at low water. The western shore is comparatively bold to and both Grassy Point and Stony Point may be approached within one hundred yards with not less than five fathoms. Both shores of the bay present in summer a very beautiful appearance,—the slopes on the western bank especially being in some places cultivated nearly to the summit of the hills and in others showing alternate thick woods and patches of cultivated land. On the eastern bank, two miles and three-quarters above Teller's Point, is the village of **Croton**, and about one mile and a half above this is **Cruger's Landing**, a little below Stony Point. On the western bank, about one mile and a quarter above Waldberg Landing and at the northern base of High Tor, is the village of **Haverstraw**,—situated upon comparatively low land close to the shore and surrounded by cultivated grounds. At the northern end of the village is **Pullen's Point**, which has a large wharf and back of the wharf a brick-yard. Haverstraw has a population of about seven thousand; but the approaches to it are shoal and there is but little trade. One mile and three-eighths above the village and about three miles above Waldberg Landing is **Grassy Point**,—the southern extremity of **North Haverstraw**. The shore is thickly settled and there are many wharves.

One mile above Grassy Point is **Stony Point**, a round bluff-looking point covered with scrub and having a white light-tower on its summit, near which is a low white dwelling. It is the northern extremity of Haverstraw Bay as well as the southern point of entrance to what is known as The Highlands. The Highlands are formed by spurs of the Catskill

The Highlands. Mountains, which here extend from the main ridge to the river. The shores are bold-to and the channel is deep and unobstructed. **Stony Point Light-house** is an eight-sided white tower, twenty-four feet high, and shows a fixed white light, of the fifth order, from a height of one hundred and seventy-nine feet above high water, visible thirteen miles. Its geographical position is

Latitude 41° 14' 26" N.
Longitude 73° 58' 20" W.

During thick weather a bell is struck by machinery at intervals of fifteen seconds.

On the eastern bank, at Cruger's, there is an extensive brick-yard; and five-eighths of a mile to the northward of this and directly opposite to Stony Point is a shallow cove, about nine hundred yards wide at its mouth, called **Green's Cove**. None but the smallest vessels can enter it as it is full of flats. On its southern side is **Montrose Point**, which is low, nearly level and cleared; and on its northern side is **Verplanck's Point**, nearly opposite to but three-eighths of a mile above

Verplanck's Point. Stony Point. It is high and grassy, for the most part cleared, and has a few ornamental trees on its summit. On the shore, close to the water, are extensive brick-works; and this feature extends almost to Peekskill.

The bank is bold-to and may be approached anywhere within one hundred and fifty yards with not less than five fathoms. Nearly opposite to the point and a little over one mile above Stony Point, on the western bank, are **The Lime Kilns**, easily recognizable from the fact that the rock behind them has been quarried away and shows perpendicular faces to a height of about one hundred feet. There are also a number of long, low, white sheds at the base of the quarry, close to the water's edge.

Between Stony Point and The Lime Kilns the slopes show here and there precipitous faces, formed by the outcropping ledges; and this feature extends to the northward as far as The Dunderberg. This shore is not so bold-to as the eastern bank, but it may be approached within two hundred yards, between Stony Point and The Lime Kilns, with not less than three and a half fathoms; and between The Lime Kilns and Caldwell's within a quarter of a mile with not less than four fathoms.

Between Verplanck's and Stony points the river is barely half a mile wide, but gradually increases, until abreast of The Lime Kilns it is five-eighths of a mile wide, with a depth in the channel of from eight to ten fathoms. Here is the entrance to what is known as Peekskill Bay; for here the river turns to the northeastward, forming a reach about two miles and a quarter long and from three-quarters of a mile to one mile in width, which leads up to the town of Peekskill. The eastern shore of the

Peekskill Bay. bay is much lower than the western, diversified with woods and occasional patches of cleared land, and has many brick-yards close to the water's edge. The town of **Peekskill** is situated at the bottom of a shallow bight into which not more than four feet at low water can be carried; and it is not safe, therefore, to approach it without a pilot. It has about seven thousand inhabitants, several iron foundries and some river trade. Just below the town and about one mile and a half above Verplanck's Point is a small shallow cove known as **Lent's Cove**. Opposite to it, on the western bank, is the famous **Dunderberg Mountain**, (sometimes called **The Dunderberg**,) a very high, densely wooded hill, with flat lands at its base, and terminating to the eastward in a long, low, flat point called **Kidd's Humbug**. At the southern base of the hill is a landing and small settlement known as **Caldwell's**. At **Kidd's Humbug** the bank is nearly level, cultivated, and has one or two houses on it.

The northern suburb of Peekskill is called **Red Hook Landing** and is easily recognized from below, as a cluster of low white houses, situated at the base of a rather high steep bluff, nearly opposite to but a little above The Dunderberg. Here the

Anthony's Nose. river turns abruptly to the northwestward for two miles and a quarter and gradually contracts in width,—being less than four hundred yards wide about one mile and a quarter above **Red Hook**. This reach forms the most beautiful part of The Highlands,—having on the east Anthony's Nose, in the foreground The Dunderberg, and in the middle distance the famous Iona Island. Between Red Hook and Anthony's Nose the eastern shore is high and steep,—the slopes being densely wooded, with occasional outcropping ledges with perpendicular faces. Anthony's Nose is a very high, steep and thickly wooded hill, with a slope towards the water of about forty-five degrees.

The western shore, between The Dunderberg and Fort Montgomery, is also composed of high, steep and densely wooded hills; but unlike the eastern shore is very irregular in outline and indented by several coves. On the northern side of The

Iona Island. Dunderberg makes in a long shallow cove known as **Snaky Hollow**,—nearly bare at low water; and on the northern side of this is Iona Island, which is not in reality an island,—being connected with the mainland at low water. When seen from the southward it will appear as a rather low, rocky islet covered with scrub, with bare grey rocks cropping out here and there and several white houses appearing among the trees near the centre. This island is a famous place of resort during the summer. (See View.)

About three-quarters of a mile above Iona Island is **Doodletown Bight**, a long shallow cove making to the southward and nearly bare at low water. Half a mile above it is **Papola Creek**, narrow and shallow, and directly opposite **Papola Creek.** to Anthony's Nose. On the northern side of this creek are the remains of **Fort Montgomery**; but they are not discernible from the river. Both banks are bold-to from Red Hook to West Point and may be approached anywhere within one hundred yards with from three to eight fathoms.

Abreast of Anthony's Nose the river turns to the northeastward, running about NE. $\frac{1}{4}$ N. for a little over two miles to **Denning's Landing**, abreast of which, on the western bank, is **Con's Hook**. Both banks are hilly, steep, and for the most part thickly wooded. At **Denning's Landing** six fathoms may be taken to within fifty yards of the shore.



Verpharokk Pt.

Red Bank

View of Peleskall Bay, from off Verpharokk Point.

The Lower River

Con's Hook, or **Conner's Hook**, on the western bank, is formed by a low rocky point, thickly covered with scrub and joined to the mainland by marsh. The hills in its vicinity rise in regular steps or terraces and are thickly wooded to their summits. Nearly opposite to it, on the eastern bank, and close to Denning's Landing, is a very peculiar looking peaked hill, whose regular outlines make it sufficiently remarkable when seen from the southward. It is known as **Sugar Loaf Mountain**. **Con's Hook.**

At Con's Hook the course of the stream is slightly more to the northward,—being about N. by E. $\frac{1}{2}$ E. for about two miles and a half to West Point. Both banks are hilly and wooded, but the western bank is the steeper, as a strip of comparatively low land skirts the base of the hills on the eastern bank. About one mile above Con's Hook, on the western shore, will be seen a cascade, whose milk-white foam has given it the name of **Buttermilk Falls**; and about a quarter of a mile above it, perched upon the summit of the hill, is the well-known **Cozzens' Hotel**. Near the falls, at the base of the hills, there are also several houses. The buildings at West Point are plainly discernible from abreast of the falls,—the large dome of the observatory being the most prominent object. **Buttermilk Falls.**

On the eastern bank, about one mile and five-eighths above Denning's Landing and about half a mile above Buttermilk Falls, is Lower Mine Point, a flat rocky point covered for the most part with fir trees. A small shallow cove makes in on its eastern side; and three-eighths of a mile to the northward of it is **Phillipae's Landing**, now rarely used, as **Garrison's Landing**, three-eighths of a mile above it, is now the principal means of communication with West Point. At Garrison's there is a small settlement on the low shore near the river, with a hotel, post office and railway station. Communication with West Point is kept up by a small ferry-boat. **Lower Mine Point.**

The western bank, between Buttermilk Falls and West Point, is composed entirely of high, steep and densely wooded hills with bare outcropping ledges here and there. At intervals along the slopes will be seen houses peeping out from among the thick foliage. These mark the line of the road leading from Cozzens' to West Point.

West Point is a high, bluff, thickly wooded point, almost entirely occupied by the grounds and buildings of the **United States Military Academy**,—the latter being the most prominent objects in this part of the river. On the northeast it descends to a bare rocky point, upon the extremity of which stands a low, square, wooden tower painted white. This is **West Point Light-house**. On the southern side of the point a broad road descends from the Academy grounds to a large wharf, where the ferry-boat lands. The light-house shows a fixed white light, of the sixth order, from a height of forty feet above high water, visible eleven miles, and is useful as marking the sharp bend in the river between West Point and Constitution Island. The point is bold-to and may be safely approached within one hundred yards. **West Point.**

The eastern bank from Garrison's to Constitution Island continues high and thickly wooded; but the hills retreat farther back from the bank,—leaving a strip of marsh land between them and the river. Here a sharp bend is made,—the stream running about WNW. for about five-eighths of a mile between Constitution Island and the northern side of West Point. This bend is locally known as **The World's End** and has very deep water,—thirty-six fathoms being found in the channel. On its southern shore are seen the water-batteries, storehouses, work-shops and other structures belonging to the Academy; and on the summit of the hill a large hotel and several other buildings. On the northern shore is the bold, bluff, rocky outline of **Constitution Island**, thickly covered with woods, and with bare rocky ledges showing here and there. Its southwestern end, known as **Magazine Point**, is composed of bare rock with a few fir trees on it. Here the river is barely a quarter of a mile wide. **Constitution Island.**

Abreast of Constitution Island the river again turns to the northwestward, having a general course about N. by W. $\frac{1}{2}$ W. for about two miles and three-quarters, to the lower end of Newburgh Bay, which begins between Great Neck Point on the east and Cornwall Landing on the west. On opening this reach the high, steep, rocky and wooded hill known as **The Crow's Nest** will appear on the western bank a little above Constitution Island, with precipitous cliffs of bare rock showing here and there on its sides; and just above it the equally steep and prominent hill known as **The Storm King**, opposite to the village of Cold Spring. On the northern side of Constitution Island the eastern bank curves away to the eastward and then to the northward,—thus forming a shallow cove, on the banks of which stands the village of **Cold Spring**. The work-shops and furnaces of the great **West Point Iron Foundry** are stretched along the shore and form very conspicuous objects. The village is situated on tolerably level ground at the northern base of the hills, and there is good anchorage abreast of it in from four to seven fathoms, but obstructed by a dangerous reef known as **The Brothers**. **The Crow's Nest and The Storm King.**

From abreast of Cold Spring the city of Newburgh will be seen in the distance, apparently at the head of the reach, with a rocky islet covered with patches of scrubby trees nearly in range, but a little to the westward of the town. Still farther to the westward will appear the village of New Windsor. The island is called **Polopens Island**, and lies about a quarter of a mile from the east bank, at the southern end of Newburgh Bay.

On the east bank, about three-quarters of a mile above Cold Spring wharf, a low rocky point, with precipitous faces and covered with patches of scrub, projects into the river to the very edge of the channel. This is **Little Stony Point**, and seen from the southward appears like an island. Behind it rises **Bull Hill**, nearly fifteen hundred feet high—a very prominent feature. About one mile above the point is **Breakneck Point**, a very remarkable hill, composed almost entirely of bare rock with nearly perpendicular faces, having patches of scrub here and there in the hollows. The hill terminates in a long point of bare rock, which is noticeable as being the last rocky point on the east bank as far up as Fishkill Creek. **Little Stony Point.**

On the west bank, above The Storm King, the shore continues steep, rocky and wooded all the way to **Cornwall Landing**, and is quite bold-to. About one mile to the northward of The Storm King is a high, precipitous, rocky hill which descends, with bare, nearly perpendicular sides, directly into the water. Its summit is covered with scrub and it is altogether one of the most remarkable points on the river. This hill is known as **Butter Hill**; and on its north side the shore runs away abruptly to the westward toward Cornwall Landing and Murderer's Creek, at the southern end of Newburgh Bay.

Butter Hill. **Cornwall** is a pretty village, now quite celebrated as a summer resort; and there is good anchorage in from four to six fathoms anywhere off the landing or abreast of the mouth of **Murderer's Creek**. The creek is about four hundred yards wide at its mouth,—between **Flum Point** (its northern point of entrance) and the western end of the village,—is quite shallow, and of little importance. Hence to New Windsor the distance is one mile and a quarter,—the bank being comparatively low, for the most part thickly wooded, but showing cleared fields here and there. **New Windsor** is a small village of about twenty-five hundred inhabitants, situated upon comparatively low and gently sloping land, diversified with woods and cleared fields, and with a number of brick sheds extending along its water front. An almost continuous line of settlements extends from this village to the city of Newburgh, one mile and a half above. The shore is bold-to, whereas the eastern bank is obstructed by flats extending from a quarter of a mile to half a mile from shore.

On the eastern bank, above Breakneck Point, the land slopes gently back from the river,—forming a small valley almost entirely cleared and cultivated. There are several landings along this shore as far up as Polopens Island,—a narrow slue with eight feet water running along the bank between it and the sand spit making to the southward of the island. From Polopens Island to Fishkill Creek the distance is one mile and a half, and the shore is composed of moderately high, gently sloping lands for the most part cleared and cultivated, and extending back to the base of thickly wooded hills. **Fishkill Creek.** Creek is opposite to New Windsor and is six hundred yards wide at its mouth. It is very shallow,—having but two feet at low water at the entrance,—and is crossed by a bridge carrying the Hudson River Railroad.

Denning's Point, its western point of entrance, is low and thickly wooded, and has a large wharf extending to the edge of the channel. **Fishkill Landing** is one mile and a quarter above Denning's Point and exactly opposite Newburgh. It is a small village built upon gently sloping land, and is surrounded by cleared fields dotted with clumps of trees. A long wharf covered with houses extends from the shore to the edge of the channel, and has also a "slip" for the Newburgh ferry-boats. In beating to windward it is very necessary to use the lead frequently, as the flats are steep-to,—the soundings diminishing from three fathoms to three feet within one hundred yards.

From New Windsor to Newburgh the western bank shows steep sand and clay cliffs, backed by nearly level lands diversified with woods and cleared fields. **Newburgh** is a city of about eighteen thousand inhabitants and has an extensive trade. There are large manufacturing interests,—cotton and woolen goods, machinery, and flour being the principal; but there are also plaster mills, foundries and tanneries. There is also a considerable river trade in shipments of grain, flour, and especially dairy produce. Seen from the river this city presents a beautiful appearance, as the ground upon which it is built rises as it recedes from the river to a height of three hundred feet. A steam ferry connects it with Fishkill on the opposite shore.

Above Newburgh the western bank is composed of lands of moderate height, gently sloping, thickly settled, and diversified with cultivated fields and groves of ornamental trees. In the vicinity of **The Mud Hole**, however, (at the northern end of Newburgh Bay,) the land becomes higher and more steep, though preserving the same general features as that below.

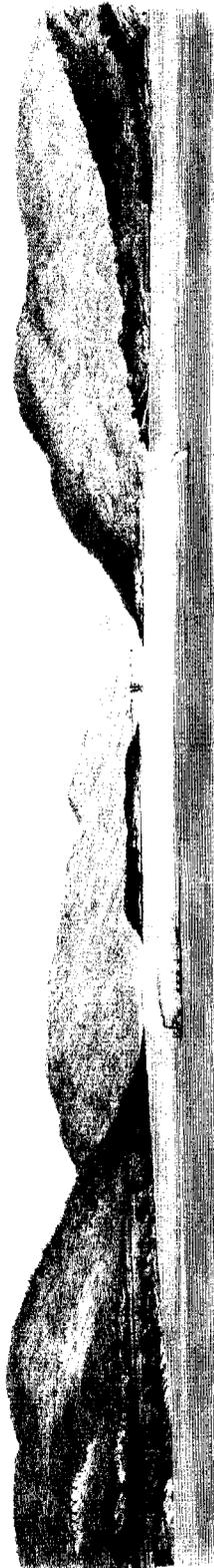
About seven-eighths of a mile above Fishkill Landing, on the east bank, is **Mount Gullian**, nearly opposite to **Balmville**; and about two miles above this is **Carthage**, a small hamlet directly opposite to **The Mud Hole** and at the northern end of Newburgh Bay. The shore between the two is somewhat lower than the western bank, but is more thickly wooded and very thinly settled. Carthage, when seen from the river, appears somewhat dilapidated, but is prettily situated close to the bank, at the foot of cleared slopes, whose summits are dotted with groves of handsome trees. The land in this vicinity is finely cultivated.

The name **Newburgh Bay** has been given to that reach of the river, a little over six miles long and with an average width of one mile and a quarter, which extends from Cornwall Landing to Carthage. Its western bank is bold-to; but the eastern bank has extensive flats with from two to three feet water, and must not be approached nearer than three-eighths of a mile.

On the western bank, from **The Mud Hole** to **Limestone Point**, the land is high, steep, and diversified with cultivated fields and groves of trees. Here the river turns to the northeastward for about two miles and a quarter with an average width of five-

eighths of a mile,—the reach terminating between **New Hamburg** on the east and **Hampton** on the west. **Limestone Point.** Both shores are comparatively bold-to as far up as **Limestone Point**; above which the western bank must receive a berth of three hundred yards and the eastern bank a berth of a quarter of a mile, until **Hampton** and **New Hamburg** are reached. **Limestone Point** is a long, low, flat, rocky point, thickly covered with a variety of low trees. A small cove, dry at low water, makes in on its northern side. Hence to **Hampton** the banks are high and rocky, mostly wooded, but showing occasional cultivated fields.

The east bank from **Carthage** to **New Hamburg**, two miles above, is composed of lands of moderate height, rocky and for the most part wooded, although there are cultivated fields here and there. **New Hamburg** is situated on a projecting point directly opposite to the village of **Hampton** and on the north side of the entrance to a small creek called **Wappinger's Creek**. On the south side of this creek is the small settlement of **Hughsonville**, some distance back from the bank. Here the river is only about three-eighths of a mile wide, but its shores are steep-to. There is, however, a dangerous reef, known as **Diamond Reef**, with five feet upon it, lying almost exactly in the middle of the river, and great care is necessary at night to avoid it.



Anthony's Nose

Lewis Island

View in the Highlands, from off Peckskill.

The Branderberg

Above **New Hamburg** the river takes a nearly straight course (about N. by E.) for nearly seven miles to **Poughkeepsie**,—the channel being entirely unobstructed and both banks steep-to. From the village to **The Old Lime Kiln**, one mile and three-quarters above, on the eastern bank, it has an average width of five-eighths of a mile; but above the latter it varies from three-eighths to half a mile as far up as **Poughkeepsie**. **The Old Lime Kiln** is a deserted ruin on the eastern bank, surrounded by cleared fields dotted here and there with a few small trees. There is a small settlement here and the remains of an old wharf. The village of **Barnegat** is situated half a mile above the kiln. Hence to **Mine Point** the eastern bank is steep and rocky, with precipitous rocky cliffs cropping out here and there. About five-eighths of a mile below **Mine Point** it projects out into a low rocky point called **Long Point**, very thickly covered with small trees; and above this it is thickly wooded and shows perpendicular rocky faces here and there. **Mine Point** is high, rocky and thickly wooded.

On the western bank, about three-quarters of a mile above **Hampton**, is the small settlement of **Marlborough**, situated close to the shore, at the base of the steep wooded hills which extend all along this bank as far up as **Blue Point**. Three miles above **Marlborough** is **Milton**, a small settlement on the western bank, built for the most part on the low ground forming a sort of gorge between two hills. The northernmost hill is wooded and the southernmost cleared and cultivated. From **Milton** to **Eagan's** the distance is one mile and a quarter, with bold, steep, wooded banks; and half a mile above **Eagan's** and directly opposite to **Mine Point** is **Blue Point**, very high, bluff and rocky, with nearly perpendicular sides and thickly wooded. The shore here is very steep-to,—seventeen fathoms being found within one hundred yards of **Blue Point**.

Blue Point.

On the eastern bank, half a mile above **Mine Point**, is **Fox Point**, the southern extremity of the city of **Poughkeepsie**. It is low, backed by thick woods, and is occupied by extensive iron-works belonging to the **Hudson River Railroad Company**. The city begins just above this point,—its wharf-line being about one mile and a quarter long. It is a town of about twenty thousand inhabitants and the centre of a very important trade, consisting of the manufacture of cotton goods, machinery, farming implements, carriages, iron ware, guns, carpets, earthen ware, flour and leather. There is also a fine marble quarry in the vicinity. **Poughkeepsie** is also celebrated for its breweries; and the famous **Vassar Female College** is located here.

Fox Point.

On the western bank, above **Blue Point**, the land is very high, steep and thickly wooded. The small settlement of **Louisburgh** and the village of **New Paltz** are situated opposite to **Poughkeepsie**, at the base of the high land. The banks are steep-to,—ten fathoms being found within one hundred yards of the shore. **New Paltz** is also sometimes called **The Highlands**. Hence to **Crum Elbow Point**, at the southern end of the reach of that name, the distance is two miles, with a very bold shore and no obstructions. All this land is high, steep, rocky and thickly wooded. Seven-eighths of a mile above **New Paltz** is **Dog Head Cove Point**, on the northern side of **Dog Head Cove**, and nearly opposite to but a little below the village of **Roosevelt**. It is a bluff, rocky and densely wooded headland, not particularly distinguished from the adjacent shore except by the indentation formed by the cove on its southern side. Three-eighths of a mile above it and exactly opposite to **Roosevelt** is **Andrews' Dock**; and about three-quarters of a mile above this is **Crum Elbow Point**, a high, thickly wooded, bluff headland with very bold shores.

Dog Head Cove Point.

The eastern bank from **Poughkeepsie** to **Roosevelt**, one mile and a half above, is comparatively low, gently sloping and thickly wooded, but backed by cleared and cultivated lands. The channel is absolutely unobstructed,—both banks being steep-to, with no middle grounds. **Roosevelt** is three-quarters of a mile below **Crum Elbow Point**, at the head of the reach. From **Roosevelt** to **Greer's Point** the distance is about two miles, and the eastern bank shows the same steep, rocky and wooded lands as those below **Poughkeepsie**. **Greer's Point** is low and rocky,—its extremity being cleared; but back of this the land is thickly wooded. Here the river turns again to the northward,—running about N. by E. for nearly five miles with an unobstructed channel and bold shores.

Greer's Point.

The western bank from **Crum Elbow Point** to **West Park**, two miles and a half above, is composed of high, somewhat steeply sloping land, having in places perpendicular rocky faces and in others sloping gently to the water's edge. This part of the shore presents a beautiful appearance in summer,—being diversified with woods and finely cultivated lands dotted with handsome houses. From **West Park** to abreast of **Esopus Island** the distance is one mile and three-quarters in a N. by E. direction,—the land being low, rocky and thickly wooded.

West Park.

On the eastern bank, from **Greer's Point** to the village of **Hyde Park**, the distance is a little over one mile and the land comparatively low, with gentle slopes, and diversified with woods and cleared and settled country. **Hyde Park** is situated close to the bank, at the mouth of a small stream called **Crum Elbow Creek**. From **Hyde Park** to **Bard's Rock**, one mile above, the land partakes of the same general character,—being low and thickly wooded, with occasional cleared fields. **Bard's Rock** is a low rocky point, thickly wooded, and backed by cultivated fields dotted with trees. Both banks are bold-to as far up as this point, and the western bank as far up as **Pelham**; but the eastern bank, from **Bard's Rock** to **Staatsburgh Creek**, one mile and five-eighths above, is somewhat shoal and should receive a berth of about an eighth of a mile,—especially in the vicinity of **Blunt's** and **Bolles' islands**. **Bolles' Island** is a mere mass of rock with a few bushes and small trees upon it, lying about half a mile above **Bard's Rock** and fifty yards from the eastern bank. There is no passage inshore of it. **Blunt's Island** is three hundred yards to the northward of **Bolles' Island**, and, like it, is a mass of rock with a few bushes upon it. It is seventy-five yards from shore. Three-eighths of a mile to the northward of it and about one mile above **Bard's Rock** will be seen a narrow islet, nearly in mid-river, known as **Esopus Island**. It is about seven hundred yards long N. by E. and S. by W., and in no place

Bard's Rock.

Esopus Island.

wider than one hundred yards; and when seen from the southward will appear low, rocky, and thickly wooded with bushes and low trees. It is a quarter of a mile from the eastern bank and three-eighths of a mile from the western bank, and is bold to everywhere except at its northern end, where a dangerous reef, called **The Hen and Chickens**, bare in some places at low water, makes to the northward for three hundred yards.

Esopus Island is also sometimes called **Pell Island**.

About two hundred yards above Blunt's Island, on the eastern bank, is **Rocky Point**; and hence to Staatsburgh Creek, three-quarters of a mile above, the land remains comparatively low, gently sloping, and for the most part thickly wooded. **Staatsburgh Creek** is a narrow and shallow stream of no importance, and empties into the river just above the northern end of Esopus Island. About three-quarters of a mile above it is the village of **Staatsburgh**, situated on the eastern bank; and five-eighths of a mile above this is **White's Landing**, where the river turns more to the northeastward. Several large ice-houses are seen on the bank just below Staatsburgh. Between Staatsburgh and Hoyt's the land is higher and more steep, but remains for the most part thickly wooded. It is quite bold-to,—eleven fathoms being found within one hundred yards of the shore.

On the western bank, directly opposite to Esopus Island, is the village of **Esopus**, which has a population of about five thousand. It is a little over two miles above West Park, amid a rolling country of moderate height, and in most places thickly wooded; and good anchorage is found abreast of the village in from three to four fathoms, sticky bottom. At the northern end of the village is a projecting rocky point known as **Indian Rock**; and five eighths of a mile above this, and nearly opposite to Staatsburgh, is the village of **Pelham**, with about two thousand inhabitants. On the large wharf known as **Pelham Dock**, on the water front of the village, will be seen a large stone warehouse.

When abreast of Esopus the light-house on **Esopus Meadows** will be seen, as a white tower with dwelling-house attached, standing apparently in the water. The land on the western bank, though of considerable height, is dwarfed in appearance by the high ranges of the **Catskill Mountains**, which are visible in the background stretching as far as the eye can reach. The river turns more to the northeastward about half a mile above Pelham, and continues in that direction for about one mile to abreast of the light-house, where it turns again to the northward for about two miles and a half to **Port Ewen**, on the south side of Rondout Creek. From Esopus Meadows Light-house to Port Ewen the average width of the river is between five-eighths and three-quarters of a mile.

From **Pelham Dock** to **Cave Point**, on the west bank, the distance is seven-eighths of a mile. The land is of moderate height with somewhat gentle slopes, and presents alternate thick woods and cleared land. Five-eighths of a mile above this point is **Esopus Point**, (off which is the light-house,) a thickly wooded point with somewhat steep faces descending to a long flat marsh, from which extend the meadows on which the light-house stands. The village of Rondout is plainly visible from abreast of this point, with the **Catskill Mountains** in the distance. All of this shore between Pelham and Esopus Point is shoal,—the flats making off for from two hundred to three hundred and fifty yards; and there is also a narrow shoal about five-eighths of a mile long with fifteen feet water nearly in mid-river between **Cave Point** and **Hoyt's Landing**. It is called **Esopus Middle Ground**.

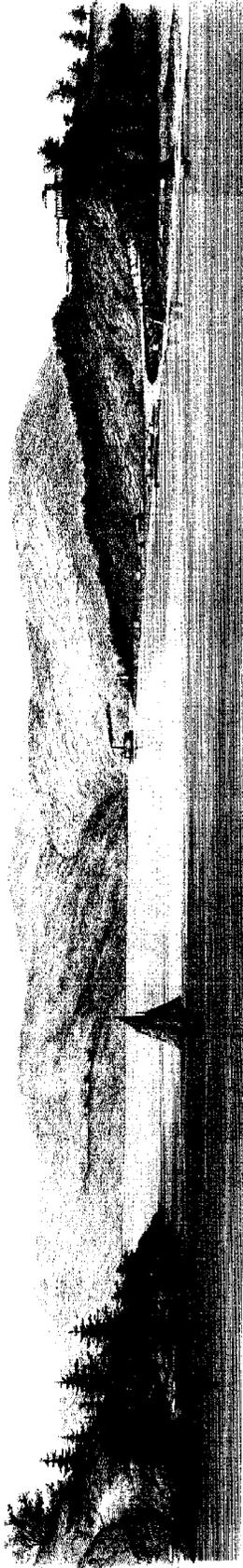
Esopus Meadows Light-house is a white tower thirty-seven feet high, attached to a dwelling of the same color, and supported on a stone pier. It shows a fixed white light, of the fifth order, from a height of fifty-three feet above the river, visible twelve miles; and may be passed within one hundred yards with not less than seven fathoms.

At **Hoyt's Landing**, on the eastern bank, the shore runs to the northeastward for about seven-eighths of a mile, and then gradually curves around to the northwestward,—continuing in that direction for about two miles and a half to **Sturgeon Point**, nearly opposite **Port Ewen**. The shore is of moderate height, somewhat lower than the west bank, very gently sloping, and diversified with woods and cultivated fields dotted with handsome houses. The small settlement of **Dinsmore** is situated on this bank about three-eighths of a mile above Hoyt's, and on the south bank of a small cove known as **Dinsmore's Cove**; and **Plawchy**, two miles and a half above Hoyt's, is about three-quarters of a mile below **Sturgeon Point**. All of this shore is shoal,—being obstructed by flats, which are in many places bare at low water,—and should not be approached nearer than six hundred yards, as the water shoals from six fathoms to three feet within a space of a few yards.

By the curve of the shore between **Dinsmore** and **Plawchy** there is formed a large bight known as **Vanderberg's Cove**, which receives the waters of a small stream known as **Landtman's Creek**. It is directly opposite to **Esopus Meadows** and is occupied entirely by flats with from two to five feet water. At its northern end, about one mile and a quarter above **Vanderberg's Cove**, **Dinsmore**, is a very small islet known as **Jones' Island**, which lies about one hundred yards from the east bank, on the edge of a grass flat, covered at high water. Abreast of this islet begins a narrow channel

running close along the east bank, between it and the long flats, known as **Plawchy Flats**, which make off from **Sturgeon Point** to the southeastward for about one mile and three-eighths. At their shoalest part, which is abreast of **Plawchy**, these flats are bare at low water and covered with grass. The channel between them and the east bank is good for fifteen feet at low water, and one hundred yards wide; but is not fit for any but steamboat navigation in the absence of buoys. **Sturgeon Point**, sometimes called **Kelly's Point**, about three-quarters of a mile above **Plawchy**, is a high bluff with perpendicular faces and crowned with a thick growth of trees. It is somewhat shoal and must not be approached nearer than an eighth of a mile.

The western bank of the river above **Esopus Point** is composed of high land, gently sloping, and so diversified with cultivated fields, grass lands and woods as to present in summer a very beautiful appearance. About one mile above the point is **Henlock Point**, just above which are seen a number of large ice-houses and a great wharf known as **Krickerbocker Wharf**.



Coastal area 1

West Light, Ill.

Landing

West Point, Ill.

West Point, from near Construction Id. (Looking down.)



Mitrovic, Ardahan
in the
View of West Point, looking up the River.

This is the depot of the Knickerbocker Ice Company, and is directly opposite to Plawchey. About eight hundred and fifty yards above this wharf is **Big Rock Point**; and five-eighths of a mile beyond this begin the wharves and docks of **Port Ewen**. This is a village of about fifteen hundred inhabitants, situated on the south side of the entrance to Rondout Creek, on high grassy land dotted with clumps of trees. The wharf-line is protected near its northern end by jetties and dikes constructed by the United States Engineers. **Big Rock Point.**

Rondout Creek is seven-eighths of a mile wide at its mouth between Kingston Point on the north and Port Ewen on the south; but nearly all of this area is occupied by flats and overflowed meadows,—leaving an available channel of not more than one hundred yards in width. The creek runs in about a **W SW.** direction for nearly two miles and a half to the village of Eddyville, where begins the Delaware and Hudson Canal; and the town of Rondout and the villages of Sleightburgh, South Rondout and Wilbur are built upon its banks. At the entrance to the creek, five-eighths of a mile above Port Ewen, on the southern side of the channel, stands the light-house known as **Rondout Light-house**, a square granite tower, attached to a dwelling of the same material, supported by a circular stone pier. It is built upon the eastern end of a long mud flat making off from Sleightburgh; and shows a fixed white light, of the sixth order, from a height of forty-two feet above high water, visible eleven miles. **Rondout Creek.**

Kingston Point, the northern point of entrance to the creek, is low, rocky and gently sloping, for the most part cleared, but dotted here and there with low trees. There is a long wharf with several warehouses on it making out from this point for one hundred and fifty yards to the edge of the channel. Opposite to the light-house on the northern side of the creek a long jetty has been built, which extends to the eastward to the edge of the channel; but with little success, thus far, in deepening the channel into the creek. A shoal has formed around the eastern end of the dike, so that where there was formerly five fathoms there is now less than two. Eleven feet at high water may be taken over the bar at the entrance; after crossing which the water deepens, and not less than ten feet at low water can be taken up to Rondout, eight feet to South Rondout, and six feet to Eddyville. **Rondout**, which occupies the north bank of the creek, is a town of eleven thousand inhabitants, and lies at the base of steep hills with perpendicular faces, rocky and wooded, and with bare ledges outcropping here and there. It is quite a thriving town,—the principal trade being in slate, bricks and cement. There is also some boat-building. **Sleightburgh, South Rondout, Wilbur and Eddyville** are small villages of little importance.

At the entrance to Rondout Creek the following lights have been established by the Light-House Board, and were first displayed August 20, 1880:

- On the end of the northern dike, a fixed red light.
- On the middle or bend of the northern dike, a fixed red light.
- On the end of the southern dike, a fixed white light.

These lights are shown from lanterns suspended from masts,—the two former at a height of twenty-one feet above mean low water, and the latter nineteen feet.

On the eastern bank, from Sturgeon Point to the village of Rhinebeck, the distance is about one mile,—the land being of moderate height, gently sloping and for the most part thickly wooded. **Rhinebeck** is a small village directly opposite to the entrance to Rondout Creek and has bold shores,—five fathoms being found within one hundred yards of the wharf-line. Three-eighths of a mile above the village and directly opposite to Kingston Point is what is known as **The Slate Wharf**. The "Telegraphic Cable" crosses here, and vessels must not anchor between the two points. Above The Slate Wharf the river widens out to about one mile and an eighth, and has a general course about **NNE.** for about four miles and half to Barrytown. About six hundred yards above The Slate Wharf there is a large wharf known as the **Ice-House Wharf**, back of which a number of ice-houses will be seen on the beach. About one mile and a quarter above the Ice-House Wharf is **Garretson's Point**, formerly called **Clifton Point**, three miles below Barrytown. It is a steep, rocky bluff, of moderate height, and covered with grass and clumps of trees. The eastern bank between The Slate Wharf and Garretson's Point has steep rocky faces and is thickly wooded. Opposite to it on the west bank is Whiskey Point, where there are also a number of ice-houses.

Whiskey Point is one mile and three-eighths to the northward of Kingston Point,—the shore between the two points being composed of nearly level land, cleared, cultivated and dotted with houses. About seven hundred yards above Kingston Point is what is known as **Brick-yard Wharf**, nearly opposite to but a little above Ice-House Wharf, and easily recognized by the clay cliffs with perpendicular faces and the brick-sheds at their base. The western shore between Kingston and Whiskey Points is shoal; and abreast of the Brick-yard Wharf begins that extensive middle ground known as **The Flats**, which extends in a **NNE.** direction for nearly four miles to abreast of Barrytown and has from two to four feet water upon it. Its northern and southern ends are buoyed; but buoys should be placed on both its eastern and western sides at intervals of about one mile to enable vessels to avoid the flats, which are very bold-to. **Whiskey Point.**

About six hundred yards above Whiskey Point are **The Cement Works**; and five-eighths of a mile above these is what is known as **Knickerbocker Pier**, easily distinguished by the large white ice-houses on the projecting point close to the water's edge. The land is comparatively low and diversified with woods, cultivated fields and houses, especially near the shore. Two miles above Knickerbocker Pier and four miles and a quarter beyond Kingston Point is Tyler's Point, opposite Barrytown. From Whiskey Point to Knickerbocker Pier is what is known as the township of **Flatbush**.

On the eastern bank of the river, three-eighths of a mile above Garretson's Point, is **Schulz' Landing**; and three-quarters of a mile above this, and nearly opposite to but a little above Knickerbocker Pier, is **Mills' Wharf**. All of this shore is bold-to

and may be approached within one hundred and fifty yards with not less than five fathoms at low water. From Mills' Wharf to Astor's Point the distance is one mile and a quarter, with a straight shore, bold-to. Astor's Point is low, rocky, with perpendicular faces, thickly wooded, and backed by cultivated fields dotted here and there with ornamental trees. On the northern side of the point there is formed a small shallow cove, on the northern side of which is a rocky islet covered with trees and called **Goose Island**. It is four hundred yards to the northward of Astor's Point and three hundred yards below Barrytown. A small projecting rocky point in this cove, about one hundred and fifty yards above Astor's, is called **Picnic Point**.

On the western bank from Knickerbocker Pier to Tyler's Point, opposite **Barrytown**, the distance is nearly two miles, with a tolerably bold shore, which may be approached anywhere within two hundred yards with not less than four fathoms. All of this shore is of moderate height, with gentle slopes, diversified with woods and cleared fields, and dotted with houses close to the edge of the shore-line. The Catskill Mountains are seen in the distance. There are several wharves and docks at Tyler's Point and a number of houses near the bank. The great middle ground called **The Flats** terminates abreast of this point; and its northern end is marked by a spar-buoy painted red and black in horizontal stripes. This shoal divides the river into two channels, known as the Main and East channels, which unite again at the northern end of **The Hog's Back**, about one mile and a half above Barrytown.

The landing at Barrytown, on the eastern bank, is easily recognized by its wharves with warehouses and ice-houses on them. Just below the landing, where a small cove makes in, a handsome house with pillared portico will be seen among the trees. This is **Edgewater House**, and is surrounded by a beautiful lawn dotted with clumps of trees. Three-eighths of a mile above the landing is **Trap Cliff**, the southern point of a large but shallow indentation in the eastern shore known as **South Bay**, and which extends from this point to Cruger's Island, one mile above. It has from one to three feet water in it and is crossed by a bridge carrying the Hudson River Railroad, which runs in a straight line from Trap Cliff to the eastern end of Cruger's Island. The dangerous middle ground known as **The Hog's Back**, and which has from three to ten feet water upon it, lies off this bay and separates the Main from the East Channel.

Cruger's Island, at the northern end of the bay, will appear, when seen from the southward, low and thickly wooded. It is not, in reality, an island, but a peninsula, lying nearly **NNE.** and **SSW.**, five-eighths of a mile long and between three and four hundred yards wide. It is low and nearly level, faced with rocks, and occupied entirely by ornamental grounds. On a point of rocks at its southern end is built a very beautiful summer-house; and when abreast of the middle of the island an opening in the trees allows a glimpse of a handsome stone villa to be seen. On the northern side of the island is an indentation similar to South Bay—known as **North Bay**. It is also shoal, and entirely closed by the Hudson River Railroad bridge. Near the northern end of the bay, and about half a mile to the northward of Cruger's, is another island, called **Red Hook Island**, but which was formerly known as **Slippe Stein Island**. It lies close in with the eastern bank, to which it is joined at low water by grass flats; but is quite bold-to on its western side. It is about a quarter of a mile long **NNE.** and **SSW.**, one hundred yards wide, and is low, rocky and thickly wooded. Between this island and Cruger's Island, and almost exactly in mid-river, is the dangerous shoal known as **The Saddle-Bags**, with from five to ten feet water upon it. The channel passes on the eastern side of this shoal and is but three hundred and fifty yards wide, although the river itself is nearly three-quarters of a mile from bank to bank. About six hundred yards to the northward of Red Hook Island is a low, rocky and thickly wooded point, with a single tree standing on its extremity. This is **Sycamore Point**; and about a third of a mile above it is the settlement of **Tivoli**, which will appear as a number of houses clustered together at the base of a remarkable yellow cliff. On the northern side of the settlement the high, steep, wooded bluff, called **De Peyster's Bluff**, will appear, and is a very prominent landmark for vessels coming down the river at night. It is about three-eighths of a mile below the entrance to Esopus Creek.

On the western bank, from Tyler's Point to Turkey Point, the distance is a little over one mile, with a straight shore, composed of thickly wooded land faced with yellowish rocks. Turkey Point is distinguished by its steep cliffs crowned with thick woods. These cliffs from their color look like sand or clay, but are in reality composed of rock. There are several large ice-houses at the base of the cliffs and usually several barges alongside,—the point being very bold-to and having ten fathoms within one hundred yards of the landing. About one mile and a quarter above Turkey Point is the settlement of **Glasco**, where is considerable trade in brick-making and the preparation of flag-stones. A very narrow channel with not less than nineteen feet in it leads close along the western shore from abreast of Turkey Point up to the village. It is called **Glasco Channel**, and leads with not less than three and a quarter fathoms as far up as Cruger's Wharf, passing on the western side of **The Saddle-Bags**. This channel, however, can only be used by steamboats. Cruger's Wharf is six hundred yards above Glasco and directly opposite the northern end of Red Hook Island. One mile and an eighth above it is **Saugerties Point**,—the southern point of entrance to Esopus Creek. This point is low and grassy, wooded with low trees, and fringed with marsh partly overflowed at high water. On the eastern end of this marsh is placed a black buoy about a quarter of a mile from the point; and a little to the northward of this and about in mid-river will be seen a square brown house, supported on a granite pier, to which is attached a low square light tower. This is **Saugerties Light-house**, and stands on the eastern extremity of the grass flats making off from the northern point of entrance to the creek. All of the western shore between Glasco and Saugerties is quite flat; while the eastern bank, on the contrary, is bold-to from Sycamore Point past Tivoli up to Clermont Wharf, three-quarters of a mile above Esopus Creek. The land on the western bank is low and gently sloping and for the most part under cultivation. The village of Saugerties appears over the level fields.

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Esopus Creek is about a quarter of a mile wide at its mouth, but rapidly contracts to less than one hundred yards. It is quite shallow and its entrance so obstructed by flats and shoals as to render it impossible for any but local pilots to enter it, and these only with the aid of steam. Jetties have been partly built at the entrance; but **Esopus Creek.** no noticeable improvement has been made in the channel up to the present writing (1880). The village of **Saugerties** is built upon the northern bank of the creek, about half a mile above its mouth, and has extensive manufacturing interests,—principal among which are those of iron blooms, white lead and paper. It has about eleven thousand inhabitants.

Saugerties Light-house is a square brick tower painted brown, attached to the keeper's dwelling, which is of the same color and two stories high. It shows a fixed white light, of the sixth order, from a height of forty-two feet above high water, visible eleven miles. It is twenty-two miles above Poughkeepsie and a little over forty miles below Albany.

About one mile and a quarter above **Esopus Creek** is the village of **Malden**, opposite to which will be seen a marsh island known as **Livingston's Flats**. The western shore is shoal between Saugerties and Malden, and vessels should not pass to the westward of the light-house bearing **S. $\frac{1}{2}$ W.** until up with the lower end of Malden, where the wharf-line extends out to the edge of the channel; and by giving it a berth of fifty yards you will pass in from four to five fathoms water. A very small islet called **Rock Island** lies near this shore—about midway between Saugerties Light-house and Malden—and one hundred and fifty yards from the western bank. It is directly opposite to **Clermont Wharf**. The principal industry at Malden is the preparation of flag-stones. Three-quarters of a mile above it is the small settlement of **Evesport**. The shore partakes of the same general character,—being composed of land of moderate height, gently sloping, and diversified with cleared and cultivated fields dotted with houses.

The eastern bank, from **De Peyster's Bluff** to **Ludlow's Wharf**, nearly three miles above, is a nearly straight shore; and being composed of rolling lands, diversified with woods and cleared fields and occasional clusters of houses, presents a beautiful appearance. Abreast of **Clermont Wharf**, one mile and a quarter above **De Peyster's Bluff**, is the southern end of the large marsh island mentioned above as **Livingston's Flats**, and which extends in a **NNE.** direction for about one mile. The **Main Channel** passes between these flats and the western shore; but there is also a channel, with not less than five fathoms, on their eastern side, which leads past **Clermont** and up to **Ludlow's Wharf**, abreast of the settlement of **Evesport**. This channel is locally known as **Livingston's Channel**. Shoal water extends from the northern end of the marsh island known as **Livingston's Flats** for about a quarter of a mile; and here makes in to the southeastward a narrow slue called **The Maelstrom**, which at this point connects **Livingston's Channel** with the **Main Channel**. It is about one hundred yards wide, with three and a quarter fathoms; but the force of the current is such that it is not safe to enter it. On the northern side of **The Maelstrom** begin the **Upper Flats**, which are to a great extent dry at low water, and which continue to the northward to **Germantown**, two miles above. They should be buoyed.

On the western bank, three-quarters of a mile above **Evesport**, is the settlement of **West Camp**; and half a mile above this **Smith's Landing**. Near the shore on this bank are many houses, especially in the vicinity of the settlements; and back of this the land gradually rises in a series of terraces to the **Catskill Mountains**. A quarter of a mile above **West Camp** is a small rocky islet known as **Wanton Island**. It is now connected with the shore by a causeway which has several ice-houses upon it. Three-quarters of a mile above **Smith's Landing** is **Gould's Wharf**,—the land between the two points being low, flat and wooded. There are also several ice-houses on **Gould's Wharf**. On the northern side of the wharf is a small cove, nearly dry at low water, known as **Duck Cove**; and on the northern side of this is a nearly flat grassy point called **Puddecart Point**, the southern extremity of a large indentation in the western shore, now almost entirely filled with mud and grass flats and known as **In-bach Marshes**. These marshes extend to **Green Point**, one mile and a half above, and the shore presents a very irregular outline,—being much cut up by small coves. Midway between **Puddecart Point** and **Green Point** is **Dewitt's Point**, which is cleared, faced with rocks and backed by woods. The same description applies to **Green Point**.

On the eastern bank, about one mile and a quarter above **Ludlow's Wharf** and directly opposite to **Smith's Landing**, is **East Camp**; and half a mile above this is **Germantown**, a small village of fifteen hundred inhabitants. This shore is quite flat and must not be approached nearly until about three-eighths of a mile above the village. A shallow creek makes in about a third of a mile above the village and almost directly opposite to **Gould's Wharf**. Seven-eighths of a mile above this creek is **Germantown Dock**; and nearly two miles above this is **Livingston's Creek**, formerly called **Rôleff Jansen's Kill**.

On the western bank, seven hundred yards above **Green Point**, is **Yerie's Chip**, another low and wooded point, faced by marsh, which extends off for about an eighth of a mile; and two miles and a quarter above this is the village of **Catskill**, situated on **Catskill Creek** and at the base of the **Catskill Mountains**. Three-quarters of a mile below the mouth of **Catskill Creek** is **Ramshorn Creek**, a very small and shallow stream; and on its southern side **Ramshorn Point**, low and marshy, but backed by higher lands for the most part wooded—but in places cleared and cultivated. Near the river the shore is low and wooded and faced with marsh; but in the background are cleared and cultivated fields. **Catskill** is situated on the northern bank of the creek, and is accessible only by means of a long wharf, which extends to the eastward, from the northern point of entrance to the creek, for about four hundred yards to a flat island, about three hundred yards long, situated on the edge of the flats, and covered with ice-houses. A prominent object in this vicinity is the **Prospect Park Hotel**, which will appear, when seen from the river, as a very large wooden building, painted white and surmounted by a cupola. Above **Catskill** strangers cannot go,—the river being so full of flats and other shoals as to render its safe navigation impossible without a pilot.

On the eastern bank, about one mile and an eighth above the mouth of **Livingston's Creek**, is **Livingston's Dock**; and half a mile above this **Oak Hill Depot**, on the **Hudson River Railroad**. The land gradually rises to **Oak Hill**, which is quite

high and well wooded and has a prominent house and church on its summit. Abreast of the wharf at Oak Hill Depot begin the dangerous flats to the southward of Rodgers' Island; and here the Main Channel keeps the western shore. Oak Hill Depot is locally known as **Catskill Station**; and there is here a "slip" for the ferry-boat which connects the Station with Catskill.

Rodgers' Island is three-quarters of a mile above Oak Hill and close to the eastern shore. It is nearly one mile long **NE.** and **SW.**, low and thickly wooded, and is separated from the eastern bank by a channel from one hundred and fifty to three hundred yards wide, known as **Hallenbeck's Creek**, which has not less than eight feet in it, although the channel is in places not more than fifty feet wide. The island is surrounded by mud flats covered with grass; and there is a marsh islet about three hundred yards long off its southwestern end. Vessels must keep the western shore aboard until past Rodgers' Island, after which the deep water gradually approaches the eastern bank.

From Catskill Wharf to **Brando Point** is what is known as **Perey's Reach**. The western bank is comparatively low and thickly wooded, with perpendicular faces here and there. Off Brando Point are large flats, marked by a black spar-buoy; and here the channel begins to approach the eastern shore. The village of **Athens** is about one mile and an eighth above Brando Point and about three miles and a half above Catskill. It has a population of about three thousand, but its trade is mostly local. Opposite to it, on the eastern bank, is **Hudson City**, situated upon a high bank with perpendicular faces, at the base of which are many wharves, warehouses, foundries, etc. This bank projects between two large but shallow coves known respectively as **North Bay** and **South Bay**, into which small vessels pass through "draws" in the railroad bridges which cross them. The southern point of entrance to South Bay is called **Merino Point**, and is low, cleared, flat, and has several houses on it. There is at Hudson a very extensive river trade and large manufacturing interests,—the city having a population of nearly ten thousand. A little below the town is the southern end of the great **Hudson Middle Ground**, an extensive flat making to the southward from **Four Mile Point**, (two miles and a half above Athens,) and bare at low water from its southern end for a mile and three-quarters to the northward. On this southern end is built a light-house, called **Hudson City Light-house**, which is plainly visible from abreast of Rodgers' Island. It is a one-story brick dwelling with mansard roof, supported by a stone pier, and surmounted by a low square tower, from which a fixed white light, of the sixth order, is shown fifty-four feet above high water, and visible eleven miles. The Middle Ground occupies nearly the whole of the river bed, leaving two very narrow channels,—the Eastern and Western,—the former about fifty yards wide in its narrowest part, with three fathoms, and the latter about one hundred yards wide, with fourteen feet. Both shores are faced with flats, bare at low water and covered with grass. The land is low and wooded, with occasional steep faces. At the northern end of Athens makes in a small shallow stream known as **Murderer's** or **Maudener's Creek**, on the northern side of which is **Grove Point**, where there is a large dock. Grove Point is low and flat near the river, but backed by higher, somewhat steep lands. Above this the western bank is very irregular in outline—being much cut up by small coves—as far up as **Four Mile Point**.

On the eastern bank, one mile and a quarter above Hudson City, is a low projecting point, with somewhat steep faces. Known as **Priming Hook**; and one mile and five-eighths above this is the entrance to **Kinderhook Creek**, on which is situated the village of **Columbiaville**. The shore is flat in its approaches,—mud flats covered with grass making off for nearly half a mile.

Four Mile Point, on the western bank, is about two miles and a half above Athens, and is somewhat steep, cleared near the shore-line, but backed by thick woods and faced with rock. On its extremity is built a stone light-tower, painted white, eighteen feet high, and showing a fixed white light, of the sixth order, from a height of eighty-six feet above high water, visible eleven miles. Near it is the keeper's dwelling, which is also white and one story high. About two miles and three-eighths above **Four Mile Point** is the village of **Coxsackie**. The banks between the two points are composed of alternate cleared and wooded lands with low steep faces. The best channel is close along the western bank, with fourteen feet water, and so continues as far up as **Stuyvesant Landing**.

On the eastern bank, a little over two miles above Kinderhook Creek and just below **Coxsackie**, is **Fordham Point**, of moderate height, with somewhat steep slopes, for the most part cleared, but dotted here and there with trees. **Nutten Hook**. Five-eighths of a mile above it, and nearly opposite to **Coxsackie**, is **Nutten Hook**, a large projecting point which, when seen from the southward, appears like a wooded island, with its western end much the highest, and faced with rocks. A long wharf makes off from the southern end of the Hook to the edge of the channel and is commonly known as the "Steamboat Landing."

Abreast of the northern end of **Nutten Hook** and nearly in mid-river is the southern end of **Coxsackie Island**, about three-quarters of a mile long, low and flat, covered with low bushes except at its northeastern and northwestern ends, where there are large bushy trees. There is also an ice-house on the island. On its northern side a passage about one hundred yards wide separates it from an islet nearly half a mile long and composed entirely of meadow scarcely elevated above the river. This islet is known as **Coxsackie Meadows**; and on its northern end, supported on a mass of rocks, is **Coxsackie Light-house**, a square, red, brick tower, attached to a two-story dwelling of the same color, rising from a circular stone pier. It shows a fixed white light, of the sixth order, from a height of forty-two feet above high water, visible eleven miles; and there is an equally good channel on both sides of it, although the **Main Channel** passes to the eastward. The river is here full of flats and navigation very dangerous except for steamboats of light draught.



View from near Escopus Lt. Ho. Looking up Catskill Mountains in the distance.
Rogers, N. Y.

About one mile and a half above Nutten Hook, on the eastern bank, is **Stuyvesant Landing**, abreast of the village of **Stuyvesant** and a short distance above Coxsackie Light-house. The village has a population of about twenty-five hundred, but is of no commercial importance. A road connects it with **Kinderhook**, about five miles back from the river.

Three-quarters of a mile above Coxsackie Light-house is the southern end of a low, flat, wooded island known as **Bronx Island**, which extends in a N E. direction for about one mile and a quarter to abreast of Stuyvesant Light-house. It is surrounded by mud flats covered with grass, and there is no passage on its western side,—the channel passing to the eastward of it. The northern end of this island is one mile and a half below the village of New Baltimore.

Stuyvesant Light-house, on the eastern bank, is one mile and a quarter above the village, and is situated upon a low projecting point, cleared and partly under cultivation. It is a square tower of red brick attached to a dwelling of the same color,—the whole being supported on a granite pier,—and shows a fixed white light, of the sixth order, from a height of forty-two feet above the river, visible eleven miles. From this light-house to Albany the distance by the river is fourteen miles. Nearly one mile and a quarter to the northward of it is **Houghtailing Island**, a flat, partly wooded and partly cleared island, lying nearly in mid-river and about one mile and five-eighths long. Opposite to it, on the western **Stuyvesant Light-house**, is the village of **New Baltimore**, with about twenty-six hundred inhabitants and a small river trade. The channel is close to the western bank, with fourteen feet at low water, and is protected by a long dike extending from the western point of Houghtailing Island to the southern end of Mull's Island, a distance of nearly one mile; and by another, extending from the village front to the southern end of Barren Island, three-quarters of a mile above. Opposite to the southern end of the dike, on a low, flat, sandy islet about one hundred yards long, is a stake supporting a light of the sixth order, known as **New Baltimore Light**. It is fixed white, shown from a height of sixteen feet, and visible eight miles. The island, which was formerly known as **Shad Island**, is now called **Lamp Island**, and is fast washing away. On the dike itself, about three hundred yards above **Lamp Island**, is what is known as **New Baltimore Dike Light**, a portable beacon eighteen feet high, showing a fixed white light, of the sixth order, visible nine miles.

Houghtailing Island, on its northern side, is separated by a passage about two hundred yards wide from Lower Schodack Island, and by a passage a quarter of a mile wide from Mull's Island, or **Five Hook Island** as it is sometimes called. Lower Schodack is low, flat and for the most part well wooded, though showing occasional cleared fields on its western side. Mull's Island is also flat and wooded, with occasional cleared fields. The former is nearly two miles long and the latter about five-eighths of a mile; and both are widest in the middle, gradually diminishing in width towards their northern and southern ends. There is no passage between Lower Schodack Island and the eastern bank of the river, nor between **Lower Schodack** it and Mull's Island,—the dike shutting off communication. The Main Channel, with about seven and a **and Mull's Islands**. half feet, passes to the westward of Mull's Island, between it and a small rocky island about six hundred yards long called **Barren Island**. On the dike, near the southern end of Mull's Island, is **Five Hook Island Light**, a portable beacon twelve feet high, showing a fixed white light, of the sixth order, from a height of eighteen feet above high water, visible eight miles; while on the northern end of the island is another light, known as **Coeyman's Bar Light**, twenty feet high, and showing a fixed white light, visible nine miles. A dike begins at **Flat Point**, the easternmost point of this island and about midway of its length, and extends to the southern end of **Mull's Plaāt**, a distance of about five-eighths of a mile. It is called **Coeyman's Dike** and shuts off the passage between Mull's Island and Lower Schodack Island.

On the western bank of the river, about one mile and a quarter above New Baltimore, is the village of **Coeyman's**, with about three thousand inhabitants and having a very large river trade. Its wharf-line, which shows several large docks, is almost directly opposite to the northern end of Mull's Island,—the channel passing between them with nine feet at low water.

On the eastern side of the river, behind Lower Schodack Island and about one mile above its southern end, is **Little Schodack Island**, about seven hundred yards long, flat and wooded, and separated by a passage, fifty yards wide and nearly bare at low water, from Schodack Island, or **Upper Schodack Island**, (as it is sometimes called,) which lies close in with the eastern bank,—being separated from it by a passage about seventy-five yards wide, called **Schodack Schodack Island Creek**. This island is a little over one mile and three-quarters long, with an average width of about four hundred yards, except at its northern end, where it terminates in a long narrow point about one hundred yards wide. This point is about five-eighths of a mile below Castleton. The small settlement of **Schodack** occupies the eastern bank of the river, nearly opposite to but a little below Little Schodack Island.

On the western bank, about half a mile above Coeyman's and nearly opposite to the southern end of Mull's Plaāt, is **Roha Hook Light**, a portable beacon, situated just behind the angle of the dike on that side of the river and on the southern side of the point known as **Roha Hook**. It shows a fixed white light, of the sixth order, from a height of seventeen feet above high water, visible eight miles.

On the extreme northern end of Mull's Plaāt is another portable beacon, marking the southern end of the **Schodack Channel Dike**, which runs from the northern end of the Plaāt to the eastern extremity of Upper Schodack Island, a distance of a little over half a mile, and shuts off the passage between the Plaāt and Schodack Island. The light, which is known as **Schodack Channel Light**, is fixed white, of the sixth order, shown from a height of twenty feet above tide-water, and visible nine miles. From a projecting point called **Elm Tree Point**, about nine hundred yards above **Elm Tree Point**, the northern end of Schodack Channel Dike and the same distance to the southward of the northern end of Schodack Island, begins **Castleton Dike**, which extends for a little over half a mile to the eastern bank, which it joins about a quarter of a mile below the southern end of the village,—thus cutting off the entrance to Schodack Creek from the northward.

Behind this dike and about midway between its northern and southern ends is **Nine Mile Tree Light**, a portable beacon, showing a fixed white light, of the sixth order, from a height of twenty feet above tide-water, visible nine miles.

About five-eighths of a mile above the northern end of Mull's Plat and near the western bank is **Shad Island**, low and flat and about twelve hundred yards long, which is partly wooded and partly grassy; and there is no passage between it and the western bank. All of this part of the shore is comparatively low, partly cleared, but for the most part

Shad Island. wooded, with houses dotting the bank here and there. Half a mile to the northeastward of **Shad Island** is a flat, wooded island, a little over one hundred yards long, called **Little Schermerhorn Island**; and about four hundred yards to the northward of this is the southern end of **Schermerhorn Island**, also flat and wooded, about seven hundred yards long, but not more than fifty yards wide. Both islands are surrounded by dangerous flats, which extend for seven hundred yards to the southward, or nearly opposite to **Nine Mile Tree Light**, and for half a mile to the northward, or nearly abreast of **Cow Island Light**.

About one mile to the northward of **Shad Island** is **Cedar Hill Point**, at the base of **Cedar Hill**. It is nearly opposite to the southern end of **Cow Island** on the east bank, and there is a small, flat, grassy island, called **Sills Island**, about one hundred yards from it, on the southern edge of the flats. Grass flats make off from **Cedar Hill Point** to the eastward for about a quarter of a mile; and on these will be seen the remains of an old wing-dam, now covered with mud. A dike has been built by the United States Engineers, from the northern end of **Schermerhorn Island**, in a straight line for about one mile to the end of the dock at the eastern base of **Cedar Hill** and opposite to the southern end of **Campbell's Island**. This dike is known as **Cedar Hill and Schermerhorn Dike**, and crosses the **Schermerhorn Island** and **Cedar Hill Point Flats**,—cutting off communication with the old Western Channel.

On the east bank, opposite **Schermerhorn Island** and about a third of a mile above **Nine Mile Tree Light**, is the village of **Castleton**, with about six hundred inhabitants. A small creek, known as **Van Buren's Kill**, makes in just below the village; and another, called **Mitche's Kill**, five-eighths of a mile below **Van Buren's** and behind the northern end of **Schodack Island**. The village is of little importance, but has several wharves and some river trade. Between it and **Cow Island**, three-eighths of a mile above, is what is known as **Castleton Bar**,—for the improvement of which operations are regularly being carried on by the United States Engineers and the State of New York. The land back of **Castleton** is of moderate height, hilly and undulating, and is diversified with woods and cleared and cultivated fields. Just above the village makes in a small stream, called **Maudener's Kill**, which is, however, of no importance.

Cow Island is about a quarter of a mile long **NNE.** and **SSW.** and about one hundred and fifty yards from the east bank. On its southern end is **Cow Island Light**, a portable beacon, twelve feet high, showing a fixed white light, of the sixth order, from a height of twenty-two feet, visible nine miles. From the western point of **Cow Island** to the southern end of **Campbell's Island** extends **Cow Island Dike**, six hundred yards long, shutting off the passage between **Campbell's Island** and the east shore. **Campbell's Island** is a little over three-quarters of a mile long, three hundred yards wide at its

Campbell's Island. widest part, (which is near the middle,) and tapers to about fifty yards at its northern and southern ends. It is low, flat and thickly wooded, and is separated from **Pixtaway Island** (which here forms the eastern bank of the river) by a passage one hundred and fifty yards wide, which is, however, shut off at both its northern and southern ends by dikes. That at the northern end extends from the north point of **Campbell's Island** to **Pixtaway Point**, the southern point of entrance to the northern end of **Pixtaway Creek**, which separates the island of that name from the mainland. All along the western shore of **Campbell's Island** are dangerous flats with from three to five feet water; and abreast of the lower end of the island and between it and the northern end of **Schermerhorn Dike** is what is known as **Campbell's Bar**, which has from eight to nine feet water upon it.

On the western bank, nearly opposite to the northern end of **Campbell's Island** and about half a mile above the northern end of **Cedar Hill Dike**, is **Parada Hook**. A dike extends from this point to a projecting point on **Bear Island**, about half a mile above. **Bear Island** lies close in with the western bank, from which it is separated by a very narrow and shoal passage about twenty-five yards wide. The island is about nine hundred yards long, flat, and for the most part wooded, though there are occasional grass lands. At its southern end, on the corner of the dike, is **Bear Island Light**, a fixed white light of the sixth order, shown from a stake at an elevation of twenty feet above tide water, and visible nine miles. It replaces the light which was formerly shown at **Parada Hook**. **Parada Hook** was formerly called **Winnie's Point**; and between it and **Bear Island** is **Winnie's Bar**, with eight feet at low water.

One mile and a quarter above **Parada Hook** and about half a mile above the northern end of **Bear Island** is **Van Wies' Point**, where there is a large wharf, known as **Van Wies' Wharf**. This shore is all of moderate height,—the land rising with a gentle slope to the high hills in the background,—and is for the most part wooded, though there are occasional cultivated fields. A quarter of a mile above the wharf is the southern end of the great stone dike known as **Van Wies' Dike**, which extends without interruption to **Bogart's Island**, two miles above,—thus cutting off the flats on the western side of the river. On the southern end of this dike is **Van Wies' Point Light-house**,—a stone beacon twelve feet high, painted white and surmounted by a lantern which shows a fixed white light, of the sixth order, from a height of eighteen feet above tide water, visible nine miles. Nearly opposite to it and about in mid-river will be seen a red spar-buoy. This is on **Austin's Rock**, a dangerous ledge, with from three to six feet water. Lying almost exactly in mid-river, about two hundred yards **ENE.** from the light-house. The channel passes between this buoy and the light-



Manakongah - 1871

View off Barytown looking down

Chimney R.

house,—the old east channel having filled up. It is proposed to remove this rock to a depth of seven and a half feet at low water; and this will probably be done in the course of a year or two. Van Wies' Dike continues to the northward for nearly one mile, where it strikes the southern end of a flat, marshy, wooded island called **Beacon Island**. Beacon Island, lying on the eastern edge of the flats making off from the western shore. This island is seven hundred yards long, and the dike skirts its eastern shore and thence the eastern shore of the marshy wooded island an eighth of a mile to the northward of it, terminating at the southern end of Bogart's Island at what is known as **Cross-Over Light**. This is a portable beacon abreast of Papscaene's Bar, and shows a fixed white light, of the sixth order, from a height of twenty-six feet, visible nine miles.

On the eastern bank, nearly one mile and five-eighths above the northern end of Pixtaway Island and seven hundred yards above Van Wies' Point Light-house, begin Papscaene's Flats, a very dangerous shoal, making in a northerly direction for about half a mile. Some remains of an old dam, known as **Van Wies' Dam**, are still visible; but the depth on the shoal has been much increased by constant dredging and by the long dike lately constructed by the United States Engineers. It is hoped that in a short time the bar will be entirely removed. About three miles above the northern end of Pixtaway Island is Papscaene's Point, nearly opposite to the Cross-Over; and here also is what is known as **Papscaene's Point** and **Papscaene's Bar**, and sometimes **The Upper Overslaugh**. This shoal has, however, been almost entirely removed by dredging within the last few years. About nine hundred yards above Papscaene's Point is **Douw's Point**; and a quarter of a mile above this is the southern end of **Cuyler's Dike**. It extends to the northward for twelve hundred yards to the southern end of the town of Greenbush, opposite Albany. On the southern end of this dike is a portable beacon known as **Cuyler's Dike Light**, which shows a fixed white light, of the sixth order, from a height of twenty feet above tide water, visible nine miles. This is the last light met with on the river.

On the western bank, at the northern end of Van Wies' Dike, is **Bogart's Island**, about three hundred yards long, flat, for the most part wooded, but showing occasional cleared patches. On its western side, and extending from abreast of Papscaene's Bar to the lower end of Albany, a distance of one mile and a third, is **Westerloe's Island**. It has an average width of about three hundred and fifty yards, is low, nearly level, and diversified with woods and grass land. On its eastern side and near its northern end is a flat islet about a third of a mile long, also partly wooded and partly grassy, known as **Small Island**; and between this and Cuyler's Dike is the shoal commonly known as **Cuyler's Bar**.

Albany, the capital of the State of New York, is situated on the western bank, one hundred and twenty-four miles above the mouth of the river, and presents a beautiful appearance when viewed from the southward,—being situated on the flat land near the river bank and extending to the westward up the slopes of the hills, so that the houses appear to rise one above the other in regular gradation, as though built upon terraces,—the observatory, state-house and many churches being prominent objects. The highest part of the city is about two hundred and twenty feet above the river. The wharf-line is about two miles long, extending up to abreast of the village of Bath on the eastern bank. The city has a population of about seventy-five thousand and an immense canal trade,—being connected by canals with Lakes Erie, Ontario and Champlain. A very important article of commerce is lumber, which is received from all parts of the country in vast quantities and thence distributed to the various seaports.

Opposite to Albany, on the eastern bank, is **Greenbush**, a town of about seven thousand inhabitants; and between the two the river is only about three hundred yards wide. The water-front of the town, which is about one mile long, is for the most part situated upon a flat island called **Van Rensselaer Island**, separated from the mainland by grass flats overflowed at high water, and occupied by warehouses, factories, etc. The town itself occupies both the island and the mainland. At its northern end Greenbush is joined to the village of **Bath**. A dike protects the eastern side of the channel from the northern end of the wharf-line of Bath, extending nearly as far as **Base Island**, a little over one mile above. The United States Engineers are engaged in closing the gap between this dike and **Base Island Dike**, which also protects the eastern side of the channel. Another dike commences about half a mile above **Base Island**, on the western bank, and extends nearly to Round Shoal buoy, (a distance of five-eighths of a mile,) and has a small fish-house on it near its southern end. Other dikes are in process of construction, and dredging operations are constantly going on with the purpose of improving the width and depth of the channel; but at present there is no navigation above Albany except for canal boats in tow and steamboats of light draught.

At Albany the river takes a turn to the northeastward, running about **NE. $\frac{1}{2}$ N.** for about two miles and a half, to abreast of the lower end of Troy; then about **N. $\frac{1}{2}$ E.** for a little over half a mile, to abreast of The Iron Works at the mouth of Winant's Kill; and then about **NNE.** for one mile and five-eighths, to the railroad bridge, which closes river navigation. The western bank, above Albany, is formed by a nearly flat plain, rising as it recedes from the river to a range of hills from two to three hundred feet in height. The shore is thickly settled and the slopes and summits of the hills dotted with houses,—presenting a beautiful appearance in summer. The flat grassy islands known as **Park Island** and the two **Mix Islands** lie close in on this bank,—the former being about one mile and a quarter above Albany and occupied by a race-course with its necessary buildings; and the latter lying close together to the northward and extending to abreast of The Iron Works at the mouth of Winant's Kill. On the northern side of the small narrow channel separating these islands from the mainland begins the village of **Watervliet**, which is now a suburb of West Troy. **West Troy** extends to the mouth of the Mohawk and about a third of a mile along the western bank of the latter, and contains a population of about twelve thousand. **Watervliet** is noted principally as being the site of the **United States Arsenal**, which occupies a large square of ground near the northern end of the village.

The eastern bank of the river above Bath, though low near the shore, rises much more abruptly to the high ground, and is rather thinly settled until the suburbs of Troy are approached. About three miles above Bath is the mouth of **Winant's Kill**, with a wharf and dock on its southern side and a number of large buildings with tall smoke-stacks on its northern side. These are **The Iron Works**, and are situated at the southern extremity of the city of **Troy**. This city has a population of about fifty thousand and a wharf-line of over three miles in length. **Poesten Kill** runs through the lower third of the city, emptying into the Hudson about one mile and an eighth above the mouth of **Winant's Kill**; and these two creeks, with the dam abreast of the middle of **Green Island**, furnish ample water-power. Accordingly, **Troy** is famous for its manufactures,—among which are flax paper, woolen goods, cotton, nails and carpets; besides iron foundries, stove-works, machine-shops and many other industries. Like **Albany**, this city is situated upon a low plain, which rises gradually, as it recedes from the river, to the hills in the back-ground. Of these hills two are especially noticeable,—**Mount Ida**, just back of the southern end of the city, and **Mount Olympus**, near the northern end,—the latter being a mass of bare rock between two and three hundred feet high.

In the middle of the river, opposite to the centre of the city, is a large flat island about three-eighths of a mile long, known as **Starbuck Island**. It is occupied principally by factories. About one hundred and fifty yards to the westward of it is the southern end of **Green Island**, which forms the eastern point of entrance to the **Mohawk River**. It is almost entirely occupied by the village of **Green Island**, which has a population of about four thousand. A bridge crosses the river from about the middle of the city of **Troy**, across **Starbuck** and **Green islands**, to the western bank; and here river navigation ceases.

The **Mohawk River** is also crossed by this bridge about half a mile above its mouth, and navigation above this is carried on by canal.

DANGERS

IN ENTERING AND PROCEEDING UP THE HUDSON RIVER.

As before mentioned, no strangers and few sailing vessels attempt to navigate this river without the aid of steam. It has, however, an excellent and safe channel, suitable for vessels of the largest size as far up as **Rondout**; but above this the channel, though deep, (having not less than three and a half fathoms at low water as far up as **Hudson City**;) is so much obstructed by bars and flats as to render its navigation difficult with a pilot and entirely unsafe without one. Schooners of less draught than fifteen feet are sometimes sailed as far up as **Barrytown**. Small sloops sometimes go to **Albany**; but the vast majority of the great number of vessels trading upon the river take a tow-boat at **New York**.

From **The Battery** at **New York** to the entrance to **Spuytyn Duyvel Creek**, eleven miles and a half above, the eastern bank of the river is bold-to and may be safely approached within fifty yards with not less than twenty-three feet at low water. The western bank, from **Communipaw Docks** to **Castle Point**, two miles and a half above, may be approached to within fifty yards of the wharf-line with not less than eighteen feet; but between **Castle Point** and **Fort Lee** it is somewhat shoal in its approaches and vessels of greater draught than thirteen feet should give this shore

Off Weehawken , a berth of-----	$\frac{3}{4}$ mile.
Off Guttenberg -----	600 yards.
Off Bull's Ferry -----	$\frac{1}{2}$ mile.
Between Bull's Ferry and Fort Lee -----	600 yards.
Off Fort Lee -----	$\frac{1}{2}$ mile.

From **Fort Lee** to **Huyler's Landing**, five miles and a half above, vessels of more than thirteen feet draught should give this western bank a berth of six hundred yards; but it must be remarked that the water shoals very gradually and the use of the lead will enable a stranger to avoid the flats.

On the eastern bank, off **Riverdale**, nearly one mile above **Spuytyn Duyvel Creek**, you must give the shore a berth of an eighth of a mile, when you will pass in not less than seven fathoms; but above this you may approach it anywhere within one hundred and fifty yards as far up as **Yonkers**. Abreast of **Yonkers** you must give it a berth of three hundred and fifty yards; but between **Yonkers** and **Hastings** three hundred yards will be sufficient and you will pass in not less than four fathoms. From **Hastings** to **Irvington** you may pass within three hundred yards of the shore with not less than twenty-six feet at low water; but above **Irvington** the flats gradually encroach upon the channel, and abreast of **Tarrytown** they extend off for over five-eighths of a mile. A red buoy should be placed on the western edge of the flats off the southern end of **Tarrytown**, and another off **Kingsland's Point**; and such action will be recommended.

On the western bank, from **Huyler's Landing** to **Closter Landing**, one mile and a quarter above, the shore should receive a berth of a quarter of a mile; and between **Closter Landing** and **Preston's Bone Factory**, one mile and three-quarters above, the same distance should be allowed. Opposite **Hastings** the western shore should receive a berth of not less than six hundred yards, and at **Snedden's Landing**, opposite **Dobbs' Ferry**, a berth of eleven hundred yards, for here begins that extensive area of flats which occupies the western half of the river from **Snedden's Landing** to **Verdrietege Hook**, extending from five-eighths of a mile to one mile and a half from shore. The **Erie Railroad Wharf**

at Piermont should receive a berth of eleven hundred yards; the shore at Bight a berth of one mile and three-eighths; at Nyack one mile and a quarter; and at Verdrietege Hook seven-eighths of a mile, to avoid the flats. The narrowest part of the channel is off Tarrytown and Kingsland's Point, where it is but seven hundred yards wide. Local names are given to these flats, such as *Piermont Flats*, off Piermont; *Nyack Flats*, off Nyack; and *Hook Flats*, off Verdrietege Hook. They have from six to thirteen feet upon them. There should be a black buoy on the eastern edge of these flats, off Bight; another off Nyack, and another off Verdrietege Hook; and such action will be recommended.

Above Kingsland's Point the eastern bank must receive a berth of about nine hundred yards until you come abreast of Bishop's Rocks, two miles and five-eighths above and just to the southward of the settlement of Scarborough. These are a group of rocks bare at low water, from one hundred and fifty to two hundred yards from shore, and there is six feet on the *Bishop's Rocks*. flats a quarter of a mile outside of them. They are not buoyed; but, being almost always noticeable, are easily avoided. From these rocks to Teller's Point (the western point of entrance to Croton Bay) the whole of the eastern shore is shoal and must receive a berth as follows:

Abreast of Scarborough	1,200 yards.
Abreast of Sparta	1,200 yards.
Abreast of the State Prison (at Sing Sing)	$\frac{5}{8}$ mile.
Abreast of Sing Sing	$\frac{7}{8}$ mile.
Between Sing Sing and the mouth of the Croton River	1 $\frac{1}{4}$ miles.
Off Teller's Point	700 yards.

At Teller's Point begins Haverstraw Bay, a large portion of which is occupied by flats, especially on the eastern side. These flats, commonly known as the Croton Flats, occupy the whole of the large bight between Teller's Point on the south and Montrose Point on the north,—a distance of four miles and a quarter,—and extend as far as two miles from shore, with *Croton Flats*. a depth of nine feet at low water. They are not buoyed, but should be; and a red buoy will be recommended to be placed on their western edge abreast of Waldberg Landing, and another opposite Haverstraw. The only rule for avoiding these flats is not to go to the eastward of the line between Verplanck's Point and Rockland Lake Landing,—the latter bearing **S. by E. $\frac{1}{4}$ E.**

On the western bank give Rockland Lake Landing a berth of half a mile, and thence to Waldberg Landing give the shore a berth of a quarter of a mile to avoid the flats. Between Waldberg and Haverstraw you must not approach nearer than half a mile; but at Pullen's Point you may come within two hundred and fifty yards with not less than four fathoms. Between Pullen's Point and Grassy Point, one mile and a quarter above, the western shore must receive a berth of about three-eighths of a mile; but between Grassy Point and Stony Point the shore should not be approached nearer than five-eighths of a mile. Stony Point is bold-to and may be approached within fifty yards with not less than five fathoms.

On the eastern bank Montrose Point should receive a berth of four hundred yards and the shore of Green's Cove a berth of eleven hundred yards. Verplanck's Point, however, is very bold-to and may be approached within fifty yards with not less than four fathoms. Above Verplanck's Point there are no dangers until you come to Peekskill, where the wharf-line of the town must not be approached nearer than three-quarters of a mile.

The western bank between Stony Point and Caldwell's may be approached within four hundred yards with not less than four fathoms; but The Dunderberg is bold-to,—five fathoms being found within one hundred yards of its base. Between The Dunderberg and Iona Island you must not go to the westward of a line from the eastern point of the former to the eastern end of the latter; but above this there are no dangers on either shore until you approach Con's Hook, when a black spar-buoy will be seen about seven hundred yards to the southward of the Hook and nearly opposite to Denning's Landing. This is on the eastern side of a nine feet shoal, called Con's Hook Shoal, which lies an eighth of a mile from the western shore and has water sufficient for the largest vessels on all sides of it. When past it there are no dangers as far up as West Point, except that between Cozzens' and the Landing the western bank should receive a berth of about an eighth of a mile.

Con's Hook Shoal.

The bight on the eastern bank, between Garrison's Landing and Constitution Island, is shoal, and the shore should not be approached, after passing to the northward of West Point Light-house, nearer than a quarter of a mile. Magazine Point is very bold-to,—twenty-four fathoms being found within fifty yards of it; but the cove on the northern side of West Point is full of flats and vessels must keep the eastern shore aboard. When abreast of Constitution Island a red spar-buoy will be seen about a quarter of a mile to the northward, off the entrance to Cold Spring Harbor. This is *The Brothers*. on the western side of a detached group of rocks known as The Brothers, and bare at extreme low tides. In the reach between this and Breakneck Point there are no dangers,—the western bank being bold-to, and it being only necessary on the eastern bank not to go to the eastward of a line joining Little Stony Point and the western end of Constitution Island; and when above the former to give the shore a berth to the eastward of about four hundred yards. Above

Breakneck Point keep to the westward of a line joining the western ends of Polopons Island and Little Stony Point; and when in Newburgh Bay give the western bank a berth of four hundred yards until up with the city of Newburgh; after which you may approach within two hundred yards until abreast of Limestone Point.

The eastern shore of Newburgh Bay is, however, obstructed by the extensive *Fishkill Flats*, and must receive a berth as follows:

Between Polopons Island and Denning's Wharf	-----	$\frac{1}{2}$ mile.
Abreast of Denning's Wharf	-----	$\frac{1}{4}$ "
Between Denning's Wharf and Fishkill	-----	800 yards.
Between Fishkill Landing and Mount Gulian	-----	$\frac{1}{4}$ mile.
Between Mount Gulian and Carthage	-----	900 yards.

These flats have from one to three feet water upon them and are very dangerous, as they are exceedingly abrupt and not buoyed except about midway between Fishkill and Carthage, where there is a red spar-buoy without a number. Buoys will be recommended to be placed at intervals of one mile along their western edge.

At Carthage the eastern shore is bold-to and may be approached within one hundred yards with not less than six fathoms; but between this and New Hamburg it should receive a berth of about four hundred yards, as *the bight between New Hamburg and Hughsonville is full of flats*.

On coming abreast of Limestone Point a spar-buoy painted red and black in horizontal stripes will be seen in mid-river about half a mile off, and a little below New Hamburg.

Dimond Reef. This is on Dimond Reef, a detached rock with five feet at low water lying about midway between the Hampton and New Hamburg shores. The buoy is placed in twelve feet on the western side of the rock and may be passed on either hand; but it is usual for large vessels to pass to the westward of it.

Above New Hamburg there are no dangers in the channel, or on either bank, until up with Esopus Island. The main channel passes to the westward of this island, although the water is deeper on the eastern side; but there is a long shoal, called *The Hen and Chickens*, making off from its northern end for an eighth of a mile with from two to nine feet upon it. It is marked by a spar-buoy painted red and black in horizontal stripes, placed for the convenience of vessels standing across the northern end of the island.

Above Esopus Island the river is clear until you are past Pelham and about midway between Staatsburg and Hoyt's Landing. Here you must look out for *Esopus Middle Ground*, a long narrow shoal, with fifteen feet at low water, extending NE. and SW. for five-eighths of a mile off Cave Point,—its northern end being opposite Dinsmore's Landing. It is not buoyed; but there should be a horizontally-striped spar-buoy on each end; and such action will be recommended. When past this shoal, you must give the western shore a berth of four hundred and fifty yards until past Esopus Meadows Light-house in order to avoid the flats called *Esopus Meadows*; and the eastern bank, from Hoyt's Landing to abreast of the same light-house, a similar berth to avoid the flats between *Hoyt's and Dinsmore's Cove*.

Vanderberg's Cove is all flat and its shore must not be approached nearer than a quarter of a mile. These flats are bold-to and great care is necessary to avoid them. From Vanderberg's Cove to Sturgeon Point, one mile and a half above, extend the dangerous *Plawchy Flats*, which, near the middle, show bare grass at low water, and have from one to ten feet upon them from the centre towards the northern and southern ends. The dry part is opposite *Plawchy* (or *Ellerslie Wharf*) and is half a mile long. A narrow pocket with from three to four fathoms runs between these flats and the eastern shore, and is used by steamboats wishing to land at *Ellerslie Wharf*; but it must not be attempted by vessels of greater draught than eight feet, as it is closed at its northern end (off Sturgeon Point) by a *ten feet bar*. *Plawchy Flats*, at both their northern and southern ends, are marked by spar-buoys painted red and black in horizontal stripes.

The western bank, from Esopus Meadows to Port Ewen, is comparatively bold-to, and may be safely approached with not less than four fathoms as follows:

Between Esopus Meadows Light-house and Hemlock Point, within	350 yards.	
Off Hemlock Point	-----	$\frac{1}{8}$ mile.
At Knickerbocker Wharves	-----	100 yards.
Off Big Rock Point	-----	100 "
Off Port Ewen wharf-line	-----	150 "
Off Port Ewen Breakwater	-----	150 "

Between Port Ewen and Kingston Point you must keep the eastern shore aboard, giving *Rondout Light-house* a berth to the westward of between six and seven hundred yards, as the mouth of *Rondout Creek is much obstructed by mud flats* which extend out nearly to the middle of the river. The eastern end of the jetty must also receive a berth, as the water is shoal in its vicinity. Kingston Point, however, may be approached within one hundred yards with not less than three and three-quarter



View of Caper's Island from near the back door

fathoms; but between this and Whiskey Point, one mile and three-eighths above, the shore is flat and must not be approached nearer than a quarter of a mile, if using the Western Channel, until abreast of the wharf of the Newark Cement Works, half a mile above the Brick-yard Wharf. Thence to Whiskey Point keep about two hundred yards from shore, and you will pass in not less than four fathoms. From Whiskey Point to the Rosendale and Kingston Cement Works, six hundred yards above, the shore may be approached within fifty yards with not less than five fathoms.

When off Kingston Point there will be seen ahead, and about three-eighths of a mile off, a spar-buoy painted red and black in horizontal stripes, nearly opposite to but a little above the Brick-yard Wharf. This is on the southern end of The Flats, the name given to that extensive middle ground which, beginning abreast of the Brick-yard Wharf, extends to the northward to abreast of Tyler's Point, a distance of three miles and seven-eighths, and separates the river into two channels,—both equally good, but that on the eastern side of the flats being the widest. This shoal has from two to four feet upon it, is very bold-to, and therefore, in the absence of buoys, is difficult to avoid without a pilot. Buoys should be placed on both sides of it, at intervals of one mile; and, should this be done, navigation in the vicinity will be perfectly safe. There is another horizontally-striped spar-buoy at the northern end of the shoal, abreast of Tyler's Point; and here the Eastern and Western channels unite through a narrow passage with three and a quarter fathoms.

The Flats.

Strangers cannot enter Rondout Creek,—a pilot always, and a steam-tug generally, is needed in order to pass in safety.

The eastern bank, from Sturgeon Point to Barrytown, is generally bold-to,—the only shoal places being in the bight between the Ice-house Wharf and Clifton Point (where a berth of three hundred and fifty yards is necessary) and between Astor's Point and Barrytown, where you must not approach nearer than two hundred and fifty yards. Between Barrytown and Cruger's Island vessels sometimes take the Western Channel by passing between the northern end of The Flats and the southern end of The Hog's Back; but it is best to use the Eastern Channel, being careful not to go to the eastward of a line joining the southwestern end of Cruger's Island with Trap Cliff on account of the flats, which occupy the whole of South Bay and which are nearly bare at low water. Cruger's Island is comparatively bold-to and may be approached on its western side within one hundred and fifty yards with not less than six fathoms.

Beginning abreast of Goose Island, just below Barrytown and nearly opposite to Edgewater House, is Hog's Back Shoal, sometimes called *Barrytown Flats*. It extends to the northward for one mile and a half, past Turkey Point, (on the western shore,) and terminates opposite "the draw" in the South Bay Bridge and about three-eighths of a mile below Cruger's summer-house. The shoalest part, which has from three to six feet upon it, is near the centre of the flats, extending from abreast of the northern end of Barrytown for over half a mile to abreast of Turkey Point. To the northward of this the shoal has from eight to sixteen feet water. A spar-buoy painted red and black in horizontal stripes is placed on the southern end of the shoalest part, in twelve feet water, and it is usual to pass to the eastward of it.

Hog's Back Shoal.

From Cruger's Island to Red Hook Island, or Goat Island, (as it is sometimes called,) vessels must keep to the westward of a line joining the western points of the two islands to avoid the flats in North Bay, which make off to that line with from one to two feet water. Above Red Hook Island, however, this shore is bold-to as far up as Ludlow's Wharf and may be safely approached within one hundred yards with not less than four fathoms.

The western bank, between the Cement Works and Turkey Point, is shoaler than the eastern bank,—the flats being very bold-to and having from one to two feet at low water. To avoid these flats vessels should give this shore a berth as follows:

Between the Cement Works and Knickerbocker Pier.....	200 yards.
Between Knickerbocker Pier and Tyler's Point.....	150 "
Off Tyler's Point.....	100 "
Between Tyler's Point and Turkey Point.....	200 "

Turkey Point is quite bold-to and may be approached within fifty yards with eight fathoms; but about three-eighths of a mile to the northward of it begins that extensive area of shoal ground which occupies more than half the width of the river, (extending to the northward for one mile and a half to abreast of the northern end of Red Hook Island,) and of which the shoal known as The Saddle-Bags is the most dangerous part. The Saddle-Bags has from five to six feet upon it, lies nearly midway between the northern and southern ends of the main shoal, and is separated from the western part of that shoal by a very narrow slue with twelve feet water. A black spar-buoy, marked No. 3, is placed in seven feet on the southeastern end of The Saddle-Bags and must receive a berth to the westward of not less than one hundred and fifty yards. There should be a horizontally-striped spar-buoy placed upon the extreme southern end of the main shoal three-eighths of a mile above Turkey Point to mark the eastern point of entrance to the Glasco Channel; a black spar-buoy should be placed on the southeastern end of the shoal opposite

The Saddle-Bags.

to Cruger's summer-house, and another black spar-buoy on the extreme northern end of the shoal abreast of the northern end of Red Hook Island. With these changes, which will be recommended, this part of the channel will be comparatively safe.

The **Glasco Channel**, as before mentioned on page 604, is a very narrow passage, in some places not more than fifty yards wide, but with not less than eighteen feet water in it, which runs close along the western shore to Glasco and Cruger's Wharf. It is only fit for steamboats, but at low water is easily navigated,—the flats on both sides being nearly bare.

Between Cruger's Wharf and Saugerties Light-house the western shore is very shoal,—*mud flats covered with grass* extending out to distances varying from four hundred yards to three-eighths of a mile. Vessels must keep the eastern shore aboard, and must not approach Saugerties Point nearer than four hundred yards and Saugerties Light-house within one hundred and fifty yards. Strangers cannot enter Esopus Creek, as the channel is only suitable for steamers of light draught. A black spar-buoy is placed on the eastern edge of the flats and on the southern side of the entrance, and the channel into the creek is between this buoy and the light-house.

After passing Saugerties Light-house the channel approaches the western shore,—the flats gradually retiring until at Malden, one mile and a quarter above, there is deep water close alongside the wharf-line. From Malden to Puddecart Point this shore is comparatively bold-to, and it is only necessary to avoid getting to the westward of the different projecting points, or in other words not to stand into any of the bights, *which are full of flats*.

On the eastern side of the river there are many great shoals,—the southernmost of which, known as Livingston's Flats, begins about half a mile above Saugerties Light-house and a quarter of a mile below Clermont Wharf. The main portion of this flat is always out and has the appearance of a

Livingston's Flats. grassy island one mile long; but shoal water (from one to six feet) extends north and south from this island, giving to the whole flat a length of about one mile and five-eighths. A good though narrow channel, called **Livingston's Channel**, passes on the eastern side of these flats, between them and the eastern bank, carrying not less than four and three-quarter fathoms, and connected with the main channel at the northern end of the shoal by a passage called **The Maelstrom**, about one hundred yards wide, with three and a quarter fathoms, which runs between the northern end of Livingston's Flats and the southern end of Upper Flats. It is not safe, however, on account of its current, and is rarely used.

Livingston's Flats are also called *Green Flats*. Their southern end is marked by a red spar-buoy as a guide to the Main Channel.

Upper Flats begin just to the northward of Livingston's Flats and extend to the northern end of Germantown, a distance of two miles and three-eighths. Their western edge is in some places five

Upper Flats. hundred and in others nine hundred yards from the eastern bank. Where not bare at low water these flats have from one to three feet upon them, and not being buoyed are extremely dangerous to sailing vessels unless they have a leading wind. A red buoy, placed on the southern end of the projecting spur of these flats, on a line between East Camp and Wanton Island, would greatly facilitate navigation in this vicinity; and this will be recommended.

In mid-river, opposite Gould's Wharf and about one mile above Wanton Island, will be seen a spar-buoy painted red and black in horizontal stripes. This is on the southern end of **The Coal Bed**, or *Duck Cove Flats*, a dangerous middle ground, about one mile and a quarter long, lying exactly in mid-river and having from three to six feet upon it from its centre to its southern end.

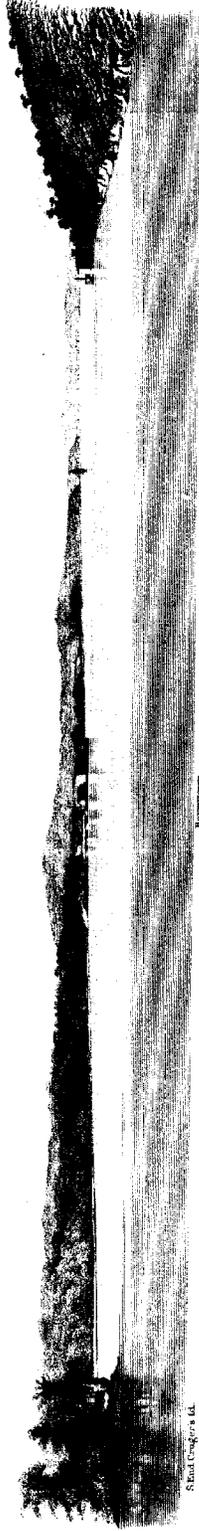
The Coal Bed. The Main Channel passes to the eastward of it; but there is a good passage one hundred and fifty yards wide, with three and a quarter fathoms, on its western side, between it and *In-bach Flats*, another long shoal, bare at low water, which forms part of that extensive area of shoal ground making to the southward from Ram's Horn Point, on the western bank. To make this channel available, however, all the shoals should be buoyed; and at present, therefore, it is best to keep the Main Channel, which passes between **The Coal Bed** and the eastern bank of the river.

Above Smith's Landing both shores are flat. The western bank, between Yerie's Clip and Catskill, should receive a berth as follows:

Abreast of Yerie's Clip	$\frac{3}{8}$ mile.
Between Yerie's Clip and Ram's Horn Point	400 yards.
Abreast of Ram's Horn Point	250 yards.
Off Ram's Horn Creek	400 yards.
Off Catskill Creek	$\frac{1}{4}$ mile.

The eastern bank, between Smith's Dock and Oak Hill Depot, should receive a berth as follows:

Abreast of Smith's Dock	200 yards.
Between Smith's Dock and Livingston's Creek	200 yards.
Between Livingston's Creek and Röleff Jansen's Kill	nearly $\frac{1}{4}$ mile.
Off Röleff Jansen's Kill	$\frac{1}{2}$ mile.
Between Röleff Jansen's Kill and Livingston's Dock	350 yards.
Off Livingston's Dock	50 yards.
Between Livingston's Dock and Oak Hill Depot	100 yards.



St. John's Island

Barrow

North Pt.

View off Cruger's Island (looking down)

The depth on all of these shoals is being annually improved, under the direction of the United States Engineers, by diking and dredging.

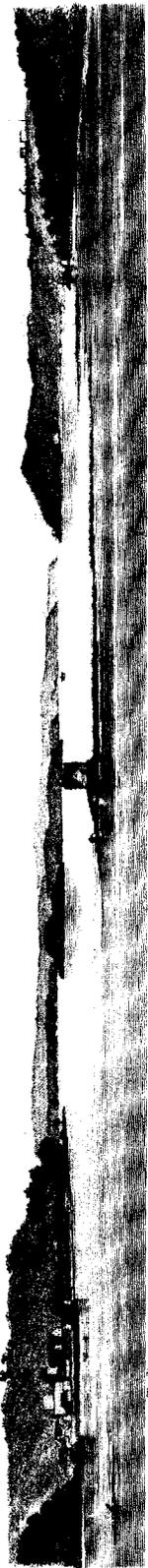
Between Albany and Troy only the following shoals are buoyed:

1. *Kellogg's Shoal*, off the **Lumber District**, with from one to three feet water, and marked by a black spar-buoy (No. 11).
2. *Fish House Shoals*, off the western shore, about three-eighths of a mile above Base Island and just below the southern end of Fish House Dike. It is marked by a black spar-buoy (No. 13).
3. *Upper Fish House Bar*, on the eastern bank, about three-eighths of a mile above the former, and marked by a red spar-buoy, not numbered.
4. *Round Shoal*, on the western bank, off the southern end of Mix's Island, about half a mile above Upper Fish House buoy, and marked by a black spar-buoy (No. 15).
5. *Covell's Folly*, on the western shore, off the northern end of Mix's Island, and marked by a black spar-buoy (No. 17).
6. *Washington Bar*, on the eastern bank, close in with the Troy wharf-line and about half a mile below Watervliet Arsenal. It is marked by a red spar-buoy (No. 14).

SAILING DIRECTIONS

FOR ENTERING AND PROCEEDING UP THE HUDSON RIVER.

On the **NE.** by **N.** $\frac{1}{2}$ **N.** course from off Tompkinsville, in New York Harbor, (see page 564,) when abreast of Castle Garden, in six fathoms, with the southern end of The Battery (Whitehall) bearing **SE.** by **E.** $\frac{1}{2}$ **E.**, distant half a mile, steer **N.** by **E.** $\frac{1}{2}$ **E.**, between the New York wharves on the east and those of Jersey City and Hoboken on the west. This course continue, carrying not less than five and half fathoms, until past Castle Point, and Stevens' house, on the summit of that point, bears **SW.** by **W.** $\frac{3}{4}$ **W.**, when you will be exactly opposite Twenty-second Street Pier, (on the New York side,) with a depth of nine fathoms. Now steer **NE.** $\frac{1}{2}$ **N.**, carrying not less than five and a half fathoms, until abreast of Fort Lee,—which should bear **NW.** by **W.** $\frac{3}{4}$ **W.**, distant about twelve hundred yards,—when **NE.** by **N.** $\frac{1}{4}$ **N.** for fourteen hundred yards will lead up to Jeffrey's Hook with not less than seven fathoms. When abreast of the Hook (which should bear **ESE.**, distant an eighth of a mile) you will have twenty-four fathoms, and **NE.** by **N.** $\frac{1}{4}$ **N.** will lead, with not less than five and a quarter fathoms, abreast of Spuyten Duyvel Creek, at the northern end of Manhattan Island. When the middle of the bridge at the entrance to the creek bears **SE.** by **E.** $\frac{1}{2}$ **E.**, distant three-eighths of a mile, steer **NE.** by **N.** $\frac{1}{4}$ **N.** for about seven miles and a quarter, which will lead with not less than three and a half fathoms past Yonkers and up with the village of Hastings. When abreast of the middle of the village, in six fathoms, with the light on the end of Piermont Wharf bearing **N.**, distant two miles and three-quarters, steer **N.** by **E.** $\frac{1}{4}$ **E.**, with Kingsland's Point almost directly ahead but open a little to the eastward of the course. You will not have less than six and a half fathoms on this course, and, when nearly up with Irvington, with the end of Piermont Wharf bearing **SW.** by **W.** $\frac{1}{4}$ **W.** and the eastern point of Verdrigtege Hook **N.** $\frac{1}{2}$ **W.**, steer **N.** $\frac{1}{2}$ **E.** until past Kingsland's Point and abreast of Nyack,—carrying not less than six and a half fathoms. When the summit of Hook Mountain bears **NW.** by **N.** and Teller's Point **N.**, steer **N.** $\frac{3}{4}$ **E.**, about for the middle of Croton Bay, and continue this course with not less than three and a half fathoms until nearly up with Rockland Lake Landing,—having the wharves at the Landing bearing **NW.** by **W.** $\frac{3}{4}$ **W.** and the lower end of the State Prison dock at Sing Sing **NE.** $\frac{3}{4}$ **E.** Now steer **NW.** by **N.** $\frac{1}{4}$ **N.** until nearly abreast of Waldberg Landing (at the southern end of Haverstraw Bay) and Grassy Point bears **NNW.**, distant three miles, with Stony Point Light-house just open to the eastward of it. You will have from four to seven fathoms on this course and must steer **N.** by **W.** $\frac{1}{4}$ **W.** towards the western extremity of Verplanck's Point, carrying not less than four and a half fathoms, until nearly up with Grassy Point. When this latter bears **W.** by **N.** $\frac{1}{2}$ **N.** and Stony Point Light-house **NW.** by **N.** **Northerly**, steer **NNW.**, with not less than seven fathoms, until abreast of Verplanck's Point, with Kidd's Humbug (at the eastern base of The Dunderberg) bearing **NE.** by **N.** $\frac{1}{2}$ **N.** Here you will have eleven fathoms, muddy bottom, and **NE.** by **N.** $\frac{1}{4}$ **N.** will lead safely through the reach with not less than five and three-quarter fathoms,—heading about for Red Hook Landing. On this course the current of ebb sets towards Verplanck's Point and that of flood into the bight between Peekskill and Red Hook; and care must be taken accordingly to make the course good. When up with Kidd's Humbug, round it at a distance of one-eighth of a mile, in from seven to twelve fathoms, and steer



View near Saugeruas looking down.

NW. $\frac{1}{8}$ N. until abreast of Anthony's Nose. On this course the least water is thirteen fathoms. Now steer **N. $\frac{3}{4}$ E.** for nine hundred yards, carrying not less than sixteen fathoms, until Fort Montgomery is abeam, when the next reach will be fairly open and **NE. $\frac{1}{4}$ N.** will lead up the middle, with not less than twelve and a half fathoms, to abreast of Denning's Landing and Con's Hook,—the latter bearing **NW. Westerly.** Now steer **N. $\frac{3}{4}$ E.** until abreast of Buttermilk Falls,—carrying not less than thirteen fathoms,—and then **NE. by N. $\frac{1}{2}$ N.,** towards the bight between Garrison's Landing and Constitution Island. On this course, when abreast of the landing at West Point, with the light-house bearing **NW. by N. $\frac{3}{4}$ N.,** distant four hundred yards, round the point at a distance of one hundred and fifty yards,—steering about **N. $\frac{1}{2}$ W.** for six hundred yards, with not less than twelve fathoms. When fairly past the light-house, with World's End reach fully open, steer **NW. by W.** towards the southern base of The Crow's Nest, carrying not less than twenty-four fathoms, until the western point of Constitution Island is abeam and the middle of Polopens Island bears **N. by W. $\frac{1}{4}$ W.** Now steer **N. by W.,** carrying not less than thirteen fathoms, until abreast of Little Stony Point, when **NW. by N. $\frac{3}{4}$ N.** will lead with not less than nine fathoms up with Polopens Island, at the entrance to Newburgh Bay. The current of flood in The World's End reach sets towards Constitution Island, while that of ebb sets on to the northern shore of West Point. This is, therefore, a dangerous part of the river in light winds, and care must be taken accordingly.

When Polopens Island is abeam and about six hundred yards off, steer **N. $\frac{3}{4}$ E.** through Newburgh Bay, carrying not less than four and a half fathoms, until abreast of Balmville. When Limestone Point bears **NE. $\frac{5}{8}$ N.,** steer **NE. by N. $\frac{1}{4}$ N.** for one mile, carrying not less than seven fathoms, until Limestone Point bears **NE. $\frac{1}{8}$ N.,** when **NE. $\frac{1}{2}$ E.** should be steered, keeping the middle of the river and carrying not less than eight fathoms. This course continue until abreast of Limestone Point, when steer **NE. by N. $\frac{1}{2}$ N.** for New Hamburg docks, carrying not less than eleven fathoms. Three-quarters of a mile on this course will bring you up with the horizontally-striped spar-buoy on Dimond Reef; and when past it, **N. by E.** should be steered towards Blue Point, and continued, with not less than six and a half fathoms, until within three-quarters of a mile of that point and just abreast of Long Point, on the eastern bank of the river. Now steer **NE. by N. $\frac{1}{2}$ N.** for about seven-eighths of a mile, heading directly for Fox Point and carrying not less than nine fathoms. When Blue Point is just abaft the beam, (bearing **W. $\frac{3}{8}$ S.,** distant four hundred yards,) steer **N. $\frac{3}{4}$ E.,** passing close to the Poughkeepsie wharf-line and carrying not less than seven fathoms. This course will take you past Crum Elbow Point and fairly into the reach. When about six hundred yards above the point, with the reach fully open, steer **N. by W. $\frac{5}{8}$ W.,** keeping in mid-river and carrying not less than sixteen fathoms. Continue on this course for about one mile until just past Greer's Point, which should bear **E. by S. $\frac{1}{4}$ S.,** distant four hundred yards, when **N. by E. Nearly** will lead, with not less than six fathoms, past Hyde Park, Esopus Island and Pelham. On this course, when just past Mulford Pier (which should bear **E. by S. $\frac{3}{8}$ S.,** distant a quarter of a mile) and within one mile and a half of Esopus Meadows Light-house, steer **NE. by N.,** with not less than seven fathoms, until abreast of this light-house, when **N. by W. $\frac{1}{4}$ W.** will lead through the next reach with not less than five fathoms. When abreast of Sturgeon Point, in nine fathoms, with Rondout Light-house bearing **N. $\frac{3}{4}$ W.,** distant one mile, steer **N. by E. $\frac{3}{4}$ E.** for a little over four miles, keeping the eastern shore aboard and carrying not less than four and a half fathoms. When abreast of Mills' Wharf, (which should be distant about an eighth of a mile,) steer **NNE.** past Astor's Point and Barrytown, carrying not less than four fathoms, until you come abreast of Livingston's Island, (in South Bay,) with Turkey Point on the western bank bearing **W. by N. $\frac{1}{4}$ N.,** distant eight hundred yards. Now steer **N. Westerly** for one mile until you come abreast of the middle of Cruger's Island. This course will clear the northern end of The Hog's Back and will carry not less than four and a half fathoms. When abreast of the middle of Cruger's Island, with the black buoy on The Saddle-Bags bearing **NNW.,** distant three hundred yards, steer **N. by E. $\frac{5}{8}$ E.,** which course will lead, with not less than four and a half fathoms, past Red Hook or Goat Island and nearly up with the lower end of Tivoli. When about an eighth of a mile to the northward of Sycamore Point and three-eighths of a mile above Red Hook Island, steer **N. by E. Northerly** until abreast of Saugerties Light-house, which must receive a berth to the westward of one hundred and fifty yards; and **N. $\frac{1}{4}$ E.** will lead, with not less than five fathoms, to Malden, on the western bank. When abreast of the southern end of Malden and about one hundred

Sailing Directions—Hudson River. yards from the wharf-line, steer **NE.** by **N.** $\frac{1}{2}$ **N.** for about two miles and five-eighths, carrying not less than five fathoms, past Evesport and West Camp, until abreast of Smith's Landing, a quarter of a mile above Wanton Island. You may, when abreast of Saugerties Light-house, steer over towards Clermont Wharf, on the eastern bank, and keep the eastern shore aboard until about five-eighths of a mile above Ludlow's Wharf, where this channel turns more towards the middle of the river, passing between Upper Flats and the grass flats off East Camp and joining the Main Channel abreast of Wanton Island with not less than fourteen feet water. The usual channel, however, passes to the westward of Livingston's and Upper Flats.

When abreast of Smith's Landing, steer **NE.** $\frac{1}{2}$ **E.** for seven-eighths of a mile, carrying not less than three and three-quarter fathoms, until you come abreast of the northern end of the settlement of Germantown, with the southern end of Puddecart Point bearing **NW.** $\frac{1}{4}$ **N.**, distant eight hundred yards. Now steer **NE.** $\frac{3}{4}$ **N.** for one mile and a half, keeping the eastern shore aboard and carrying not less than four and a half fathoms, until Green Point bears **N.** $\frac{1}{2}$ **W.**, distant half a mile, and Ram's Horn Point **NE.** $\frac{1}{8}$ **N.**, distant one mile and seven-eighths. Now steer **NE.** $\frac{3}{8}$ **E.** for two miles, carrying not less than four and a quarter fathoms, until just past Ram's Horn Point, with the steamboat landing at Catskill bearing **N.** by **E.** $\frac{1}{4}$ **E.**, distant one mile, when **NNE.** Easterly will lead with not less than six fathoms to abreast of Catskill railroad station, and with not less than ten feet to the entrance to Hallenbeck's Creek. Nine feet at low water can be taken through this creek into the Main Channel, to the northward of Rodgers' Island, but it is suitable for steamers of light draught only.

If bound through the Main Channel into Perey's Reach, when abreast of Catskill railroad station steer **N.** $\frac{5}{8}$ **W.** for five-eighths of a mile, carrying not less than nine fathoms, until the southeastern point of Rodgers' Island bears **E.** by **N.** $\frac{1}{8}$ **N.**, seen over the middle of the dry flats to the southwestward of that island. Now steer **NNE.** Northerly, with not less than seven fathoms, until abreast of the middle of Rodgers' Island; and then **NE.** $\frac{1}{4}$ **E.** for about seven-eighths of a mile, carrying not less than six and a half fathoms, until Hudson City Light-house bears **E.** by **N.** $\frac{1}{8}$ **N.**. Steer for the light-house, carrying not less than six and a half fathoms, until within three-eighths of a mile of it; when, if bound through the Western or Athens Channel you must steer **NE.** Easterly; and if bound through the Eastern or Hudson City Channel you must keep the southern shore aboard,—passing about one hundred and fifty yards to the southward of the light-house, skirting the wharf-line of the city, and keeping about midway between Hudson Middle Ground and the eastern bank. This latter, is, however, only suitable for steamers which have local pilots on board.

Above Hudson City it is not safe to go without a pilot or the aid of steam-power. The course **NE.** Easterly (above mentioned) leads, with not less than three and a half fathoms, to abreast of the middle of the Athens wharf-line; and then **NE.** by **N.** leads, with not less than fourteen feet, past the northern end of Hudson Middle Ground and nearly up to the mouth of Kinderhook Creek. Here the two channels unite, with Four Mile Point Light-house bearing **N.** $\frac{1}{4}$ **E.**, distant half a mile; and **N.** by **E.** will lead, with not less than six fathoms, to abreast of that light-house. Thence the course is **N.** for nearly seven-eighths of a mile, with not less than seventeen feet, to abreast of the middle of Four Mile Point Flats; and then **N.** $\frac{1}{4}$ **E.** for the same distance towards the eastern extremity of Nutten Hook, carrying not less than fourteen feet. On this course, when about five-eighths of a mile below Fordham Point and about two hundred yards above the Warehouse Dock, (on the west bank,) **N.** $\frac{3}{4}$ **W.** will lead, with not less than four and three-quarter fathoms, between Nutten Hook and Coxsackie Landing. When about three hundred yards to the northward of Nutten Hook Landing and about six hundred yards to the southward of Coxsackie Island, **NE.** by **N.** $\frac{3}{4}$ **N.** should be steered for a little over half a mile, with not less than four fathoms, until Coxsackie Light-house bears **N.** $\frac{3}{4}$ **W.** Now steer for the light-house, carrying not less than thirteen feet, until within three hundred and fifty yards of it, when the course turns more to the eastward so as to pass about one hundred yards to the eastward of the light-house, steering about **N.** by **E.** $\frac{1}{4}$ **E.** until up with Kinderhook buoy, when **NE.** by **N.** $\frac{1}{4}$ **N.** will lead, with not less than four fathoms, directly towards Stuyvesant Light-house.

Above this no intelligible sailing directions can be given. The channel is diked in most places, and the assistance of a local pilot is absolutely necessary for all vessels, however light their draught.

The above courses pass from four hundred to six hundred yards to the eastward of the flats between Sneden's Landing and Piermont; from three hundred and fifty to six hundred and fifty yards to the eastward of Piermont Flats; an eighth of a mile to the westward of Tarrytown Flats; the



Coast of N. H.

Eastern Dock

Portland N.

View off Four Mile Pt. (looking up)

same distance to the westward of the shoals off Kingsland's Point; from four hundred to five hundred yards to the eastward of Nyack Flats; five-eighths of a mile to the westward of Bishop's Rocks; seven hundred yards to the eastward of the flats off Verdrietege Hook; nine hundred yards to the westward of the Sing Sing Flats; six hundred yards to the eastward of the flats off Rockland Lake Landing; three-eighths of a mile to the westward of the flats off Croton Bay; nine hundred yards to the westward of Teller's Point Shoal; six hundred and fifty yards to the eastward of the flats off Waldberg Landing; from four hundred to eight hundred yards to the westward of the Croton Flats, (in Haverstraw Bay;) from nine hundred to twelve hundred yards to the eastward of Haverstraw Flats; a quarter of a mile to the westward of the flats off Cruger's; the same distance to the westward of the flats off Green's Cove; from a quarter to half a mile to the westward of the Peekskill Flats; four hundred yards to the eastward of the Snaky Hollow Flats; the same distance to the eastward of the flats off Doodletown Bight; the same distance to the eastward of the black spar-buoy on Con's Hook Shoal; about an eighth of a mile to the westward of the flats in the bight between Constitution Island and Garrison's Landing; from one hundred to one hundred and fifty yards to the northward of the flats in the cove on the northern side of West Point; two hundred yards to the westward of the red spar-buoy on The Brothers; three hundred and fifty yards to the westward of the flats between Cold Spring and Little Stony Point; four hundred yards to the westward of the flats between Little Stony Point and Breakneck Point; the same distance to the westward of the flats between Breakneck Point and Polopens Island; from three hundred yards to three-eighths of a mile to the westward of the Fishkill Flats; a quarter of a mile to the westward of the red spar-buoy on the flats about one mile below Carthage; from two hundred to three hundred and fifty yards to the westward of the Hughsonville Flats; two hundred yards to the eastward of the striped spar-buoy on Dimond Reef, (but you may pass to the westward of this buoy by giving it a berth of fifty yards;) between four and five hundred yards to the westward of the shoals off Blunt's and Bolles' islands; an eighth of a mile to the westward of Esopus Island; the same distance to the westward of The Hen and Chickens; from one hundred to two hundred yards to the eastward of Esopus Middle Ground; four hundred yards to the westward of the flats off Dinsmore's Point; three hundred yards to the westward of the flats off Dinsmore's Cove; an eighth of a mile to the eastward of Esopus Meadows; from a half to three-eighths of a mile to the westward of Vanderberg's Cove Flats; about a quarter of a mile to the westward of the southern end of Plawchy Flats; two hundred yards to the westward of the middle of those flats; an eighth of a mile to the westward of their northern end; three hundred yards to the westward of the Sturgeon Point Flats; from three hundred and fifty yards to three-eighths of a mile to the eastward of the Rondout Flats; between five and six hundred yards to the eastward of the striped spar-buoy on the southern end of The Flats; a quarter of a mile to the westward of the flats between the Icehouse Wharf and Clifton Point; six hundred yards to the eastward of the striped spar-buoy at the northern end of The Flats, (but you may pass on the western side of these flats with not less than three and three-quarter fathoms by keeping close to the western shore;) an eighth of a mile to the eastward of the striped spar-buoy on the southern end of Hog's Back Shoal; one hundred yards to the eastward of the middle of that shoal, and the same distance to the eastward of its northern end; one hundred yards to the westward of the South Bay Flats; the same distance to the westward of the southern end of Cruger's Island; two hundred yards to the eastward of the black spar-buoy on the eastern side of The Saddle-Bags; three hundred and fifty yards to the westward of the northern end of Cruger's Island; two hundred yards to the westward of the flats between Cruger's and Red Hook islands; three hundred yards to the eastward of the northern end of The Saddle-Bags; from an eighth to a quarter of a mile to the eastward of the flats between Cruger's Wharf and Saugerties Point; one hundred yards to the eastward of the buoy on Saugerties Point Flats; two hundred yards to the eastward of Saugerties Light-house; the same distance to the eastward of the flats between Saugerties and Malden; the same distance to the westward of the red spar-buoy on the southern end of Livingston's Flats; the same distance to the westward of their northern end; between two hundred and three hundred yards to the westward of Upper Flats; from one hundred to one hundred and fifty yards to the westward of the flats off Germantown and East Camp; one hundred and fifty yards to the eastward of the striped spar-buoy on the southern end of Duck Cove Flats or The Coal Bed; an eighth of a mile to the eastward of the northern end of those flats;

Sailing Directions---Hudson River.

Sailing Direc- from one hundred and fifty yards to an eighth of a mile to the eastward of the flats
tions---Hud- off In-bach Marshes; one hundred and fifty yards to the westward of the flats off the
son River. mouth of Röleff Jansen's Kill; an eighth of a mile to the eastward of the flats on the
 western shore between Yerie's Clip and Ram's Horn Point; the same distance to the
 eastward of Ram's Horn Point Flats; one hundred yards to the eastward of the flats off Ram's Horn
 Creek; from one hundred and fifty to two hundred yards to the eastward of the Catskill Flats; one
 hundred yards to the westward of the southern end of Rodgers' Island Shoals; four hundred yards to
 the westward of the southwestern end of Rodgers' Island; the same distance to the westward of the
 middle of the island, and half a mile to the westward of its northern end; from fifty to one hundred
 yards to the northward of the shoal between Rodgers' Island and Hudson City; one hundred and fifty
 yards to the southward of the black spar-buoy off Brando Point Shoal; three hundred yards to the
 westward of Hudson City Light-house; between two and three hundred yards to the westward of Hud-
 son Middle Ground; an eighth of a mile to the westward of the striped spar-buoy off the northern end of
 that shoal; about one hundred yards to the eastward of the flats between Grove Point and Four Mile
 Point; from one hundred and fifty to two hundred yards to the westward of the grass flats on the east-
 ern shore between Priming Hook and Kinderhook Creek; fifty yards to the westward of the red buoy
 on the southern end of Four Mile Point Flats; about two hundred yards to the westward of the red
 buoy on the northern end of those flats; an eighth of a mile to the westward of the flats south of
 Fordham Point; three hundred and fifty yards to the westward of the flats abreast of Fordham Point;
 two hundred yards to the westward of the Landing at Nutten Hook; one hundred yards to the east-
 ward of the southern end of Cocksackie Island Shoal; one hundred and fifty yards to the eastward of
 the black spar-buoy on the eastern edge of Cocksackie Island Shoal; the same distance to the westward of
 the flats off Rider's Point; about seventy-five yards to the westward of Stuyvesant Flats; fifty yards
 to the westward of Kinderhook buoy; seventy-five yards to the westward of the northern end of Stuy-
 vesant Flats; and from fifty to two hundred yards to the eastward of the flats off Bronx Island.

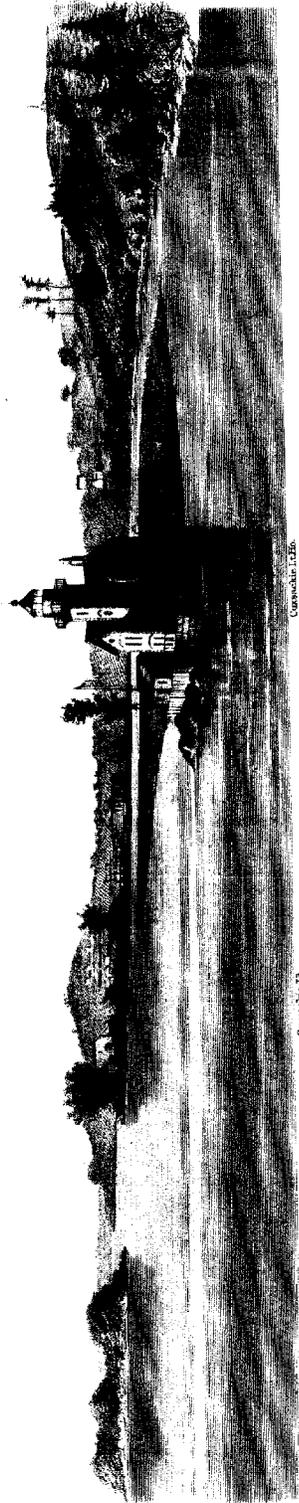
LIGHT-HOUSES.

NAME.	Latitude.			Longitude West.			Fixed or Revolving.	Height above sea-level.	Distance visible in nautical miles.			
				In arc.		In time.						
	°	'	"	°	'	"				h.	m.	s.
Stony Point Light-house	41	14	26	73	58	0	4	55	52.0	Fixed.	179	13
West Point Light-house	41	23	43	73	56	45	4	55	47.0	"	40	11
Esopus Meadows Light-house	41	52	5	73	56	12	4	55	45.0	"	53	12
Rondout Light-house	41	55	12	73	57	42	4	55	51.0	"	42	11
Saugerties Light-house	42	4	18	73	55	28	4	55	42.0	"	42	11
Hudson City Light-house	42	15	0	73	48	0	4	55	12.0	"	54	11
Four Mile Point Light-house	42	18	20	73	46	42	4	55	7.0	"	86	11
Cocksackie Light-house	42	22	45	73	47	23	4	55	10.0	"	42	11
Stuyvesant Light-house	42	24	40	73	46	23	4	55	6.0	"	42	11
New Baltimore Beacon	42	27	3	73	46	43	4	55	7.0	"	16	8
New Baltimore Dike Beacon	42	27	12	73	46	(58)†	4	55	7.9	"	18	9
Five Hook Island Beacon	42	27	43	73	46	(58)†	4	55	7.9	"	18	8
Coeyman's Bar Beacon	42	28	31	73	46	45	4	55	7.0	"	20	9
Roha Hook Beacon	42	28	54	73	47	(21)†	4	55	9.4	"	17	8
Schodack Channel Beacon	42	29	54	73	46	(40)†	4	55	6.7	"	20	9
Nine Mile Tree Beacon	42	31	6	73	45	(52)†	4	55	3.5	"	20	9
Cow Island Beacon	42	32	14	73	45	2	4	55	0.1	"	22	9
Bear Island Beacon	42	33	42	73	45	(0)†	4	55	0.0	"	20	9
Van Wies' Point Light-house	42	35	6	73	45	(30)†	4	55	2.0	"	18	9
Cross-Over Beacon	42	36	50	73	45	(44)†	4	55	3.0	"	26	9
Cuyler's Dike Beacon	42	37	39	73	45	(8)†	4	55	0.5	"	20	9

TIDES.

	Governor's Island.	Debbs' Ferry.	Tarry-town.	Verplanck's Point.	West Point.	Pough-keepse.	Tivoli.	Stuyvesant.	Castle-ton.	Albany.
Corrected Establishment	8 ^h 13 ^m	9 ^h 19 ^m	9 ^h 57 ^m	10 ^h 8 ^m	11 ^h 2 ^m	12 ^h 34 ^m	1 ^h 24 ^m	2 ^h 23 ^m	4 ^h 29 ^m	5 ^h 22 ^m
Mean Rise and Fall of tides	4.3 ft.	3.6 ft.	3.5 ft.	3.1 ft.	2.7 ft.	3.2 ft.	4.0 ft.	3.8 ft.	2.7 ft.	2.3 ft.
Mean Rise and Fall of Spring tides	5.4 ft.	4.4 ft.	4.0 ft.	3.8 ft.	3.2 ft.	3.9 ft.	4.6 ft.	4.4 ft.	3.0 ft.	2.5 ft.
Mean rise and Fall of Neap tides	3.4 ft.	2.7 ft.	2.7 ft.	2.5 ft.	2.0 ft.	2.4 ft.	3.2 ft.	3.0 ft.	2.3 ft.	1.9 ft.
Mean duration of Rise	6 ^h 0 ^m	6 ^h 5 ^m	6 ^h 6 ^m	5 ^h 25 ^m	5 ^h 28 ^m	5 ^h 41 ^m	5 ^h 40 ^m	5 ^h 18 ^m	5 ^h 1 ^m	4 ^h 26 ^m
Mean duration of Fall	6 ^h 25 ^m	6 ^h 18 ^m	6 ^h 20 ^m	7 ^h 12 ^m	7 ^h 10 ^m	6 ^h 44 ^m	6 ^h 54 ^m	7 ^h 2 ^m	7 ^h 23 ^m	7 ^h 59 ^m
Mean duration of Stand	0 ^h 28 ^m	0 ^h 17 ^m	0 ^h 43 ^m	0 ^h 16 ^m	0 ^h 20 ^m	0 ^h 22 ^m	0 ^h 23 ^m	0 ^h 31 ^m	0 ^h 20 ^m	
Rise of highest tide observed	6.3 ft.	5.0 ft.	4.5 ft.	4.8 ft.	4.9 ft.	5.5 ft.				

† Approximate.



Cassockie Pt.

View from near Cassockie Pt. (looking down)

Cassockie Pt.

Station Book

HUDSON RIVER.

621

CURRENTS.

The following table, prepared by Assistant Henry Mitchell, of the Coast Survey, gives in a concise form such information in regard to the tidal current in the Hudson River as is at present available. The velocities of the current and the times of slack water vary so much with the river flow that they cannot be given in the table.

TABLE.

LOCALITY.	Tides later than those of Sandy Hook.			The current reaches its strength after time of high water at Sandy Hook.	
	High Water.	Low Water.	Range.	Flood.	Ebb.
	h. m.	h. m.	Feet.	h. m.	h. m.
Off Eighty-sixth Street	0 59	1 8	4.2	1 13	7 34
Tappan Zee	1 33	1 39	3.9	1 58	8 28
Haverstraw Bay	2 9	2 26	3.5	2 36	9 6
Off Verplanck's Point	2 40	3 27	3.1	3 4	9 31
In The Highlands	3 30	4 22	2.8	3 21	9 41
Off Carthage	4 26	5 7	3.0	3 35	
Off Poughkeepsie	5 26	5 56	3.2	3 33	

VARIATION OF THE COMPASS.

The magnetic variation at different points in New York Bay and the Hudson River for 1880 is as follows:

Off Sandy Hook	7° 40' W.
At Governor's Island	7° 43' W.
Haverstraw Bay	8° 5' W.
Off Poughkeepsie	8° 25' W.
Off Barrytown	9° 35' W.
At Catskill	9° 5' W.
Off New Baltimore	9° 35' W.
At Albany	9° 45' W.

The present annual increase is about 2½'.

APPENDIX I.

GULF OF MAINE.

CURRENTS BETWEEN CAPE SABLE AND CAPE COD.

The necessity for reliable information upon the currents between Cape Sable and Cape Cod, at the entrance to the Gulf of Maine, has long been impressed upon navigators; and in 1877 the Superintendent of the U. S. Coast Survey directed Master Robert Platt, U. S. N., to proceed in the schooner "Drift" (a vessel built and specially fitted for the purpose) to the Gulf of Maine and make a full series of close observations on the direction and velocity of the currents, especially in the channel south of The Georges. Captain Platt's observations, which were copious and thorough, and made with the aid of the most modern appliances for Current observations, were reduced and discussed by Prof. Henry Mitchell, Assistant, U. S. Coast Survey, and the results of his discussion are given below in the following abstract from a "Notice to Mariners," published by the Coast Survey March 7, 1878. A chart of the Gulf of Maine, showing the positions of the stations and the locality of the tide-rips, will be found facing page 184.

"The simplest statement that can be made respecting these currents is" embodied in "the following General Rule:

"Between Nantucket Shoals and Cape Sable the ebb current runs to the southward during the first four and a half hours after the southing or northing of the moon. The average rate of the current each way over the entire distance is one knot an hour, but is unequally distributed,—being greater than one knot over shallow ground and less through the deep channels. The time of turning on George's Bank corresponds nearly with the time of high and low water at Boston and Portland; but in the channel to the westward of the bank it is later, and in that to the eastward earlier, by about half an hour.

"The following table gives the directions and rates of the tidal currents for four divisions of the belt examined between Nantucket Shoals and Cape Sable:

TABLE I.

LOCALITY OF STATION.	Time of turning after Moon's Transit.		First Quarter.		Greatest—				Third Quarter.		REMARKS.
	Flood to Ebb.	Ebb to Flood.	Set.	Drift.	Time after Moon's Transit.		Set.	Drift.	Set.	Drift.	
	h. m.	h. m.		Knots.	h. m.	h. m.		Knots.		Knots.	
Great South Channel, (between Nantucket Shoals and George's Bank.)	11 55	5 37	S. $\frac{1}{2}$ W.	0.94	2 37	8 43	S. by W. $\frac{1}{2}$ W.	1.30	W SW.	0.94	Ebb. Flood.
			N. $\frac{1}{2}$ W.	1.02			N. $\frac{1}{2}$ W.	1.41	N. by W.	0.85	
George's Bank, (Southern Slope.)	11 19	5 7	SE.	1.60	2 1	8 13	S. $\frac{1}{2}$ E.	1.90	S SW.	1.40	Ebb. Flood.
			NW. $\frac{1}{2}$ W.	1.60			N. by W.	1.90	NE.	1.40	
Great Eastern Chan'l, (between George's Bank and Brown's Bank.)	11 14	5 2	SE.	1.00	1 56	8 8	S. $\frac{1}{2}$ E.	1.40	S SW.	1.20	Ebb. Flood.
			NW. $\frac{1}{2}$ W.	1.10			NNW.	1.30	N. $\frac{1}{2}$ E.	1.00	
Northern Channel, (between Brown's Bank and Cape Sable Bank.)	10 50	4 38	SE.	1.25	1 32		SE. $\frac{1}{2}$ S.	1.27	S. by E.	1.00	Ebb. Flood.
			W. by N.	1.00	7 44		NW. by W.	1.38	W NW.	1.00	

"The times given in the above table are subject to variations of twenty-two minutes each way, and the velocities of the currents to variations up to one-fifth, by reason of the tidal inequalities.

"If the navigator has the 'Tide Tables for the Atlantic Coast,' issued from the U. S. Coast Survey Office, and in which high water for Boston is given for every civil day of the year, the following table will be more convenient and accurate in practical use, since no corrections of time are required for the tidal inequalities. In this table the hours at the heads of the columns are tidal hours, or twelfths of the time between any two following high waters,—one high water being assumed to occur at 0 h., the next at 12 h. The rates given are those for an ordinary tide of 9.8 feet range at Boston, and must be increased or diminished with the tide from neap to spring, and from spring to neap:

APPENDIX I.

TABLE II.

RATE AND DIRECTION OF CURRENT FOR EACH TIDAL HOUR AFTER TIME OF HIGH WATER AT BOSTON.								
LOCALITY.	O ^h		I ^h		II ^h		III ^h	
	Rate, Knots.	Direction.	Rate, Knots.	Direction.	Rate, Knots.	Direction.	Rate, Knots.	Direction.
Great South Channel	0.3	NE. by N.	0.6	SE. by E. $\frac{1}{2}$ E.	1.0	S. $\frac{1}{2}$ W.	1.3	S. by W. $\frac{1}{2}$ W.
George's Bank	0.8	E.	1.5	SE.	1.8	SSE.	1.9	S. by W.
Great Eastern Channel	0.6	E. by S.	0.9	SE.	1.3	SSE.	1.4	S. $\frac{1}{2}$ E.
Northern Channel	0.7	E. by N.	1.2	SE.	1.3	SE. $\frac{1}{2}$ S.	1.2	SE. by S. $\frac{1}{2}$ S.
	IV ^h		V ^h		VI ^h		VII ^h	
Great South Channel	1.2	S. by W. $\frac{1}{2}$ W.	0.9	S. by W. $\frac{1}{2}$ W.	0.3	SW. $\frac{1}{2}$ S.	0.5	NW. by W.
George's Bank	1.6	SW.	1.2	SW.	0.8	W. by S.	1.4	NW. by W.
Great Eastern Channel	1.3	SW.	1.0	SW.	0.3	W SW.	1.0	NW. by W.
Northern Channel	1.0	S. by E.	0.6	S.	0.3	W. by S.	0.9	W. by N.
	VIII ^h		IX ^h		X ^h		XI ^h	
Great South Channel	1.0	N. $\frac{1}{2}$ W.	1.3	N. $\frac{1}{2}$ W.	1.3	N. $\frac{1}{2}$ W.	0.9	N. $\frac{1}{2}$ W.
George's Bank	1.7	NW. by N.	1.8	N. by E.	1.6	NNE.	1.2	NE. by E.
Great Eastern Channel	1.2	NW. $\frac{1}{2}$ N.	1.3	NNW.	1.2	N. by E.	0.7	NE.
Northern Channel	1.3	NW. by W.	1.1	NW. by W.	0.9	N NW.	0.5	N. by E.

The importance of a knowledge of the times and direction of the currents in this vicinity cannot be overestimated; and, in his report to the Superintendent of the Coast Survey, Master Platt gives an example of the advantage possessed by knowledge over ignorance. He says:

"We saw a brig trying to work to the northward, and she remained in sight for thirty-six hours,—having unfortunately tacked every time just when she should not. Her master evidently did not know anything about the set of the currents, or he would have soon worked out of sight. On the other hand, we, who were familiar with the set and drift, worked from Station No. III to No. IV—a distance of twenty-four miles—in two tacks, with the wind dead ahead."

The following extracts descriptive of the tide-rips in this vicinity are also taken from Captain Platt's report:

"At Stations Nos. II and III (see Current Chart, facing page 184) we particularly noticed the tidal swell, which made up regularly with each flood-tide and subsided with the ebb. I have spoken with the masters of several fishing vessels upon this subject, and they all informed me that 'they had always noticed it, but had'—strange to say—'attributed it to the fog!'

"At Station No. III we were also surrounded, during the strength of the flood and ebb, with strong and well-marked tide-rips, which disappeared at slack water." These tide-rips (see Current Chart) are very alarming when first seen, as they look like the breakers in shoal water. Master Platt says, in reference to them:

"When in Latitude 42° N., Longitude 66° 30' W., we saw what looked like shoal water or breakers ahead, but, on sounding, found one hundred and seventeen fathoms. We drifted along with the current until we came among these apparent breakers, and found them to be caused by a very heavy tide-rip. The sea was so high and 'coaming' that we were obliged to reduce sail, three-reef the mainsail, and haul the boom well out to save our mainmast. These heavy tide-rips are nearly always well marked, and a stranger coming among them, especially at night, would be apt to be very much alarmed. I would therefore suggest that their approximate positions be marked upon our charts. They extend between Latitudes 42° N. and 43° N., and from Longitude 66° 30' W. to 68° 30' W., are from twenty to forty miles long and at least ten miles wide."

APPENDIX II.

NEW YORK BAY AND HARBOR.

PILOT LAWS AND HARBOR REGULATIONS.

PILOT LAWS FOR THE PORT OF NEW YORK.

Section XII. * * * * Any pilot bringing in a vessel from sea shall, by himself or one of his boat's company, be entitled to pilot her to sea when she next leaves the port, unless, in the meantime, a complaint for misconduct or incapacity shall have been made against such pilot or one of his boat's company, and proved before the Board of Commissioners of Pilots; provided, however, that if the owner of any vessel shall desire to change such pilot, then the said commissioners may assign any other pilot on the same pilot-boat to pilot said vessel to sea.

Sec. XIII. The fees for pilotage are hereby established as follows:

For every merchant vessel drawing less than fourteen feet of water, inward bound, and not exempted from pilotage by virtue of these regulations, three dollars and seventy-five cents per foot.

For every vessel drawing fourteen feet and less than eighteen feet of water, four dollars and fifty cents per foot.

For every vessel drawing eighteen feet and under twenty-one feet of water, five dollars and fifty cents per foot.

For every vessel drawing twenty-one feet of water and upwards, six dollars and fifty cents per foot.

If the master or owners of any vessel shall request the pilot to moor said vessel at any place within Sandy Hook, and not to be taken to the wharf or harbor of New York, or the vessel to be detained at quarantine, the same pilotage shall be allowed, and the pilot entitled to his discharge.

When any ship or vessel, bound to the port of New York, is boarded by any pilot appointed by this Board, at such distance to the southward or eastward of Sandy Hook Light-house that said light-house could not be seen from the deck of such ship or vessel in the day time, and in fair weather, the addition of one fourth to the rates of pilotage hereinbefore mentioned shall be allowed to such pilot.

Sec. XIV. The pilotage on merchant vessels outward shall be as follows:

For every vessel drawing less than fourteen feet of water, two dollars and seventy cents per foot.

For every vessel drawing fourteen feet and less than eighteen feet of water, three dollars and ten cents per foot.

For every vessel drawing eighteen feet and less than twenty-one feet of water, four dollars and ten cents per foot.

For every vessel drawing twenty-one feet and upwards, four dollars and seventy-five cents per foot.

Sec. XV. The rates of pilotage for any intermediate distance shall be determined by the Board of Commissioners, and promulgated in their rules and regulations for the government of pilots.

Sec. XVI. Between the first day of November and the first day of April, inclusive, four dollars shall be added to the full pilotage of every vessel coming into or going out of the port of New York.

Sec. XVII. For every day of detention in the harbor of an outward-bound vessel, after the services of a pilot have been required and given, except detention shall be caused by such adverse winds and weather that the vessel cannot get to sea; and for every day of detention of an inward-bound vessel by ice longer than two days for passage from sea to wharf, three dollars shall be added to the pilotage. If any pilot shall be detained at quarantine, or elsewhere, by the health officer, for being or having been on board a sickly vessel as pilot, the master, owner or agent, or consignee of such vessel shall pay to such pilot all necessary expenses of living and three dollars per day for each and every day of such detention.

Sec. XVIII. Pilotage shall be payable by the master, owner, consignee or agent entering or clearing the vessel at the port of New York, who shall be jointly and severally liable therefor.

Sec. XIX. A pilot who is carried to sea when a boat is attending to receive him, shall receive at the rate of one hundred dollars a month during his necessary absence.

Sec. XX. Masters of vessels shall give an account to the pilot, when boarding, of the draught of such vessels; and in case the draught given is less than the actual draught, he shall forfeit the sum of twenty-five dollars, which may be sued for and recovered by the commissioners as other fines and penalties.

Sec. XXI. For services rendered by pilots in moving or transporting vessels in the harbor of New York the following shall be the fees:

For moving any vessel from North to East River, or *vice versa*, five dollars, except such vessel shall have arrived from sea, or is ready and bound to sea, on the day such services for transportation are rendered; but if the services are rendered thereafter, such payment shall be made. For moving any vessel from the Quarantine Station to the city of New York, one quarter of the sum that would be due for the inward pilotage of such vessel. For hauling any vessel from the river to a wharf, or from a wharf into the river, three dollars, except on the day of arrival or departure of such vessel.

Sec. XXIX. No master of a vessel under three hundred tons burden, belonging to a citizen of the United States, and licensed and employed in the coasting trade by the way of Sandy Hook, shall be required to employ a licensed pilot; but in case the services of a pilot shall have been given, the pilot shall be entitled to the rates established. If the master of a vessel above three hundred tons burden, and owned by a citizen of the United States, and sailing under a coasting license to or from the port of New York by the way of Sandy Hook, shall be desirous of piloting his own vessel, he shall first obtain a license for such purpose from the Commissioners of Pilots, who are hereby authorized and required to grant the same, if such master shall, after an examination had by said commissioners, be deemed competent; which said license shall be and continue in force one year from the date thereof, or until the termination of any voyage during which the license may expire. For such license the master, to whom it shall be granted, shall pay to the said commissioners four cents per ton. All masters of foreign vessels and vessels from foreign ports, and all vessels sailing under register, bound to or from the port of New York by the way of Sandy Hook, 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 service as pilot to such vessel.

Any person not holding a license as pilot under this act, or under the laws of the State of New Jersey, who shall pilot or offer to pilot any ship or vessel to or from the port of New York by the way of Sandy Hook, except such as are exempt by virtue of this act, or any master or person on board a steam-tug or tow-boat who shall tow such vessel or vessels, without such licensed pilot on board such vessel or vessels, shall be deemed guilty of a misdemeanor, and on conviction shall be punished by a fine not exceeding one hundred dollars, or imprisonment not exceeding sixty days; and all persons employing a person to act as a pilot not holding a license under this act, or under the laws of the State of New Jersey, shall forfeit and pay to the Board of Commissioners of Pilots the sum of one hundred dollars.

The provisions of this act shall not apply to vessels propelled wholly or in part by steam, owned or belonging to citizens of the United States, and licensed or engaged in the coasting trade.

In 1870 (May 2) the Legislature of the State of New York enacted a law, from which what follows is an extract:

Sec. I. Henceforth no master of any vessel, navigated under a coasting license and employed in the coasting trade by the way of Sandy Hook, shall be required to employ a licensed pilot when entering or departing from the harbor of New York; but this provision shall not be construed to alter the legal rate of compensation of any pilot who may be so employed.

Sec. II. The fees for piloting vessels shall continue to be the established rates of pilotage, henceforth, as the same are established by chapter one hundred and thirty-seven of the laws of eighteen hundred and sixty-five, till the legislature shall otherwise direct.

A pilot-boat on station at Sandy Hook is required to keep, as a distinguishing signal, a union-jack at her foremast head.

No pilot-boat shall put a boy or other person than a licensed pilot on board a vessel, for the purpose of piloting said vessel, under a penalty of fifty dollars and the amount of pilotage—said sum to be paid by the owners of the pilot-boat to the commissioners. This shall not apply to vessels in distress, providing the masters of such vessels are willing to employ the services of such boy or person. Such boy or person shall keep the union-jack flying until the light-house on Sandy Hook bears S.; and in case a regular pilot takes charge of the vessel, the person who first took charge shall be entitled to half the inward pilotage.

The following rates have been established in regard to pilotage between Quarantine Station and the city:

Pilotage for taking vessels from the old to the new Quarantine:

For vessels having had death or sickness on board, double outward pilotage.

For vessels from sickly ports, but having had no sickness on board, single outward pilotage.

Pilotage of vessels from lower Quarantine to New York, half pilotage.

Pilotage of vessels from lower to upper Quarantine, quarter pilotage.

APPENDIX II.

Pilots are required, under a penalty of fifty dollars, to board the nearest vessel having a signal flying for a pilot, except in case there should be a vessel in sight with a signal of distress. They are also required, when applied to, to transport a vessel to any part of the port of New York, under a penalty of twenty-five dollars;—such service to be paid for as prescribed in Section XXI. (See page II.)

Vessels boarded north or west of a line drawn from the lights on the Highlands of Navesink to the black buoy No. 1 of the bar, thence to the red buoy No. 2 of Gedney's Channel, shall pay half pilotage only. If boarded above The Narrows, quarter pilotage. (This by-law has no reference to Section XXI.)

Renewals of masters' licenses shall date from the first license granted. A vessel having made a voyage without renewing her license, and paying pilotage, shall not derive any benefit from having paid such pilotage.

No pilotage, except the regular inward pilotage, shall be allowed when vessels are detained from the *non-visiting* of the health officer.

Vessels returning from sea in consequence of head winds or stress of weather shall pay full pilotage.

A pilot-boat when in sight of a vessel wanting a pilot shall, if there are no pilots on board, signalize the fact by running her flag or signal up and down twice in the day-time, and at night by making a like signal with her mast-head light.

A pilot in charge of a vessel is required, under penalty of forfeiting the pilotage, to stay on board of her until notified by the master that his services are no longer wanted. The omission of the master to inform the pilot that his services are not wanted will entitle the latter to "detention money," unless the detention is temporary, to take out passengers.

RATES OF PILOTAGE FROM APRIL 1 TO NOVEMBER 1.

INWARD.				OUTWARD.		
DRAUGHT.	RATE.	PILOTAGE.	OFF SHORE.	TOTAL.	RATE.	PILOTAGE.
5 feet 0 inches	\$3 75	\$22 50	\$5 62	\$28 12	\$2 70	\$16 20
6 " 0 "	3 75	24 37	6 09	30 46	2 70	17 55
7 " 0 "	3 75	26 25	6 56	32 81	2 70	15 90
7 " 6 "	3 75	28 12	7 03	35 15	3 70	20 25
8 " 0 "	3 75	30 00	7 50	37 50	2 70	21 60
8 " 6 "	3 75	31 87	7 96	39 83	2 70	22 95
9 " 0 "	3 75	33 75	8 44	42 19	2 70	24 30
9 " 6 "	3 75	35 62	8 90	44 52	2 70	25 65
10 " 0 "	3 75	37 50	9 37	46 87	3 70	27 00
10 " 6 "	3 75	39 37	9 84	49 21	2 70	28 35
11 " 0 "	3 75	41 25	10 31	51 56	2 70	29 70
11 " 6 "	3 75	43 12	10 78	53 90	2 70	31 05
12 " 0 "	3 75	45 00	11 25	55 25	2 70	32 40
12 " 6 "	3 75	46 87	11 72	57 59	2 70	33 75
13 " 0 "	3 75	48 75	12 19	60 94	2 70	35 10
13 " 6 "	3 75	50 62	12 65	63 27	2 70	36 45
14 " 0 "	4 50	63 00	15 75	78 75	3 10	43 40
14 " 6 "	4 50	65 25	16 31	81 56	3 10	44 95
15 " 0 "	4 50	67 50	16 87	84 37	3 10	46 50
15 " 6 "	4 50	69 75	17 43	87 18	3 10	48 05
16 " 0 "	4 50	72 00	18 00	90 00	3 10	49 60
16 " 6 "	4 50	74 25	18 56	92 81	3 10	51 15
17 " 0 "	4 50	76 50	19 12	95 62	3 10	52 70
17 " 6 "	4 50	78 75	19 69	98 44	3 10	54 25
18 " 0 "	5 50	99 00	24 75	123 75	4 10	73 80
18 " 6 "	5 50	101 75	25 44	127 19	4 10	75 35
19 " 0 "	5 50	104 50	26 12	130 62	4 10	77 90
19 " 6 "	5 50	107 25	26 81	134 06	4 10	79 95
20 " 0 "	5 50	110 00	27 50	137 50	4 10	82 00
20 " 6 "	5 50	112 75	28 19	140 94	4 10	84 05
21 " 0 "	6 50	136 50	34 12	170 62	4 75	90 75
21 " 6 "	6 50	139 75	34 94	174 69	4 75	102 12
22 " 0 "	6 50	143 00	35 75	178 75	4 75	104 50
22 " 6 "	6 50	146 25	36 56	182 81	4 75	106 87
23 " 0 "	6 50	149 50	37 37	186 87	4 75	109 24
23 " 6 "	6 50	152 75	38 19	190 94	4 75	111 62
24 " 0 "	6 50	156 00	39 00	195 00	4 75	114 00
24 " 6 "	6 50	159 25	39 81	199 06	4 75	116 37
25 " 0 "	6 50	162 50	40 62	203 12	4 75	118 75

APPENDIX II.

RATES OF PILOTAGE FROM NOVEMBER 1 TO APRIL 1.

(FOUR DOLLARS ADDITIONAL.)

INWARD.					OUTWARD.	
DRAUGHT.	RATE.	PILOTAGE.	OFF SHORE.	TOTAL.	RATE.	PILOTAGE.
6 feet 0 inches	\$3 75	\$26 50	\$5 62	\$32 12	\$2 70	\$20 20
6 " 6 "	3 75	28 37	6 09	34 46	2 70	21 55
7 " 0 "	3 75	30 25	6 56	36 81	2 70	22 90
7 " 6 "	3 75	32 12	7 03	39 15	2 70	24 25
8 " 0 "	3 75	34 00	7 50	41 50	2 70	25 60
8 " 6 "	3 75	35 87	7 96	43 83	2 70	26 95
9 " 0 "	3 75	37 75	8 44	46 19	2 70	28 30
9 " 6 "	3 75	39 62	8 90	48 52	2 70	29 65
10 " 0 "	3 75	41 50	9 37	50 87	2 70	31 00
10 " 6 "	3 75	43 37	9 84	53 21	2 70	32 35
11 " 0 "	3 75	45 25	10 31	55 56	2 70	33 70
11 " 6 "	3 75	47 12	10 78	57 90	2 70	35 05
12 " 0 "	3 75	49 00	11 25	60 25	2 70	36 40
12 " 6 "	3 75	50 87	11 72	62 59	2 70	37 75
13 " 0 "	3 75	52 75	12 19	64 94	2 70	39 10
13 " 6 "	3 75	54 62	12 65	67 27	2 70	40 45
14 " 0 "	4 50	67 00	15 75	82 75	3 10	47 40
14 " 6 "	4 50	69 25	16 31	85 56	3 10	48 95
15 " 0 "	4 50	71 50	16 87	88 37	3 10	50 50
15 " 6 "	4 50	73 75	17 43	91 18	3 10	52 05
16 " 0 "	4 50	76 00	18 00	94 00	3 10	53 60
16 " 6 "	4 50	78 25	18 56	96 81	3 10	55 15
17 " 0 "	4 50	80 50	19 12	99 62	3 10	56 70
17 " 6 "	4 50	82 75	19 69	102 44	3 10	58 25
18 " 0 "	5 50	103 00	24 75	127 75	4 10	77 80
18 " 6 "	5 50	105 75	25 44	131 19	4 10	79 85
19 " 0 "	5 50	108 50	26 12	134 62	4 10	81 90
19 " 6 "	5 50	111 25	26 81	138 06	4 10	83 95
20 " 0 "	5 50	114 00	27 50	141 50	4 10	86 00
20 " 6 "	5 50	116 75	28 19	144 94	4 10	88 05
21 " 0 "	6 50	140 50	34 12	174 62	4 75	103 75
21 " 6 "	6 50	143 75	34 94	178 69	4 75	106 12
22 " 0 "	6 50	147 00	35 75	182 75	4 75	108 50
22 " 6 "	6 50	150 25	36 56	186 81	4 75	110 87
23 " 0 "	6 50	153 50	37 37	190 87	4 75	113 25
23 " 6 "	6 50	156 75	38 19	194 94	4 75	115 62
24 " 0 "	6 50	160 00	39 00	199 00	4 75	118 00
24 " 6 "	6 50	163 25	39 81	203 06	4 75	120 37
25 " 0 "	6 50	166 50	40 62	207 12	4 75	122 75

Transportation North to East River, and *vice versa*—all vessels, \$5.
 Pilotage from Quarantine, one-quarter of the inward pilotage, exclusive of off shore.
 Hauling to or from wharf, \$3.
 Detention, \$3 per day.

HARBOR REGULATIONS FOR THE PORT OF NEW YORK.

Sec. III. It shall not be lawful for any person to throw any ballast, rubbish, ashes or cinders from any vessel or lighter, or from any pier or bulkhead, into the waters of the docks, slips or harbor of the port of New York, nor from out of any vessel upon any pier or bulkhead in said port, unless for the purpose of discharging the same immediately into carts. Any person who shall violate any of the provisions of this section shall forfeit and pay to the Harbor Commissioners the sum of five dollars, and the further sum of two dollars for each and every cubic yard of material so thrown out; and such fine shall be a lien, until paid, upon any vessel from which such material shall be thrown or discharged.

Sec. V. It shall be the duty of every owner, master, mate or other person having the charge or management of any vessel from which, or into which, ballast, coals, cinders, stones, bricks, tiles, dung or any loose matter or thing shall be conveyed, to fasten canvas mats or cloth between the pier or bulkhead and vessel, and between vessels lying alongside each other, to or from which such ballast or other loose material shall be conveyed, so as to prevent any part thereof falling into the waters of the port; and if to be landed, to place such material at least two feet from the edge of the pier or bulkhead, under the penalty of ten dollars for the violation of any of the provisions of this section, and for each offense, to be paid to the commissioners; and such penalty shall be a lien, until paid, on the vessel from which such ballast, coals, cinders, stone, brick, tiles, dung or other matter or thing shall be so conveyed or landed. (As amended by § 3, chap. 226, Laws of 1858.)

Sec. VI. It shall not be lawful to throw iron, lead or any metal, or any package of merchandise weighing over fifty pounds, from a vessel on to a pier in the port of New York, without adequate

protection to the planking of such pier, under a penalty of five dollars for each offense, to be paid to the commissioners, and to be a lien on the vessel until paid; nor shall it be lawful for any person or persons to draw, or cause to be drawn, or trail, or drag over any pier in the port of New York, any anchor or blocks of stone, otherwise than upon carts, rollers, wheel-carriages or sleds, under the penalty of five dollars for every offense, one half of which shall be for the use of the person or persons lawfully entitled to the occupation of such pier. (As amended by § 4, chap. 226, Laws of 1858.)

Sec. VIII. Whenever any pier or bulkhead in the port of New York shall be encumbered, or its free use interfered with, by merchandise, lumber or any other obstruction, whether of loose material or built upon or affixed to the pier or bulkhead, it shall be the duty of the Harbor Commissioners to notify the person or persons placing or keeping such merchandise or obstruction on such pier or bulkhead to remove the same within twenty-four hours after such notice; and in case of failure to comply, the person or persons so notified shall be liable to pay the commissioners the sum of twenty-five dollars for each and every day during which said merchandise or obstruction shall remain on such pier or bulkhead. And the commissioners shall have power, in their discretion, to remove any merchandise so encumbering any pier or bulkhead, and to store the same in a warehouse or other proper receptacle; and a sum equal to the amount of the expenses of removal, together with the charges for storage, shall be paid by the owner of such merchandise to the commissioners, and shall be a lien on such merchandise until paid.

Sec. IX. Whenever merchandise discharged from a vessel and encumbering a bulkhead or pier in the port of New York shall not, in the judgment of the Harbor Commissioners, be of sufficient value to pay the expenses of removal and storage, as provided in the last preceding section, such merchandise shall be removed and stored at the expense of the owner, consignee or master of the ship or vessel from which such merchandise shall have been discharged.

Sec. XII. Any person mooring any vessel to any of the buoys or beacons placed in the harbor of New York by the United States Light-house Board, or in any manner hanging on with a boat or vessel to any such buoy or beacon in said harbor, shall forfeit and pay to the commissioners of the port the sum of fifty dollars for every offense; and any person who shall willfully remove any such buoy or beacon shall be deemed guilty of a misdemeanor, and, in addition to the punishment which may therefor be inflicted, he shall forfeit and pay to the said commissioners the sum of two hundred and fifty dollars for every offense.

Rates of Wharfage, &c.—It shall be lawful to charge and receive, within the cities of New York and Brooklyn, wharfage and dockage at the following rates, viz: From every vessel that uses or makes fast to any pier, wharf or bulkhead, within said cities, or makes fast to any vessel lying at such pier, wharf or bulkhead, or to any other vessel lying outside of such vessel, for every day or part of a day, as follows: From every vessel of two hundred tons burden and under, two cents per ton; and from every vessel over two hundred tons burden, two cents per ton for each of the first two hundred tons, and one half of one cent per ton for every additional ton, except that all canal boats navigating the canals in this State, and vessels known as North River barges, shall pay the same rates as heretofore; and the class of sailing vessels now known as lighters shall be at one half the first above rates; but every other vessel making fast to a vessel lying at any pier, wharf or bulkhead within said cities, or to another vessel outside of such vessel, or at anchor within any slip or basin, when not receiving or discharging cargo or ballast, one half the first above rates; and no boat or vessel shall pay less than fifty cents for a day or part of day; and from every vessel or floating structure, other than those used for transportation of freight or passengers, double the first above rates. And every vessel that shall leave a pier, wharf, bulkhead, slip or basin, without first paying the wharfage or dockage due thereon, after being demanded, shall be liable, by the owner, consignee or person in charge of the vessel, to pay double the rates established by this act.

It shall be lawful for the owner or lessee of any bulkhead, pier or basin, in the port of New York, to charge and receive the sum of five cents per ton on all goods, wares or merchandise remaining on the bulkhead or pier owned or leased by him, for every day after the expiration of twenty-four hours from the time such goods, wares, or merchandise shall have been left or deposited on such pier or bulkhead, and such charge shall be a lien thereon until paid, excepting merchandise and other property delivered on a wharf for transportation by canal boats through the canals owned by this State, and also excepting such merchandise as may be landed on a bulkhead for storage purposes, by the owner or occupant of a warehouse immediately in front of and adjoining the bulkhead on which such merchandise shall be landed, which may be permitted to remain thereon eight days without being subject to the charge aforesaid. Nothing contained in this section shall be so construed as to conflict with the eighth section of the act to establish regulations for the port of New York, passed April 16, 1857, and amended April 16, 1858.

Harbor Encroachments.—It shall not be lawful to obstruct or interrupt the navigation of the waters of the port and harbor of New York by any incumbrance whatever; and in case of any such obstruction or interruption, by reason of any sunken vessel or other thing, the Board of Commissioners of Pilots shall notify the owner or owners of such vessel or thing, if such owner or owners are within the city and county of New York, and are known to them, to remove the same within

three days after such notice; and in case such owner or owners are not known to the said Board of Commissioners of Pilots, or are not within the said city and county of New York, or fail to comply with such notice, the said Board of Commissioners of Pilots shall cause the said obstruction to be removed, and the expenses of such removal shall be paid by the county within whose jurisdiction such vessel or thing shall be,—recoverable from the owner or owner's of such vessel or thing, by, and in the name of, the Board of Supervisors of such county; such expenses shall also be a lien on the vessel or thing so removed until paid.

Port Wardens. * * * * * It shall be the duty of the Board of Port Wardens, or some one of the members thereof, to attend personally all sales of vessels, (when condemned,) vessels' materials, and goods in a damaged state which shall be sold at public auction in the port of New York by reason of such damage, for the benefit of owners or underwriters, or for account of whom it may concern; and it shall be the duty of auctioneers making such sales to give due notice thereof to said Board before the sale, and all such sales shall be made by auctioneers, under the direction and by order of the wardens, for which service they shall be entitled to receive a commission of one half of one per cent. on the gross amount of sales thereof, to be paid to said Board of Wardens on demand, by the auctioneer making such sale; and such property shall be exempt from the payment of auction duties to the State; and it shall be the duty of auctioneers to make monthly statements to said Board, specifying the total amount of each day's sales made by them under this act, which statement shall be filed in said wardens' office; and the wardens, when required by the owner or consignee, shall certify the cause of such damage, the amount of such sales, and the charges on the same, all of which shall be recorded in the books of said office; and the said Board of Wardens shall be allowed for each and every survey held on board of any vessel, on hatches, stowage of cargo or damaged goods, or at any warehouse, store or dwelling, or in the public street, or on the wharf, within the limits of the port of New York, on goods said to be damaged, the sum of two dollars; and for each and every certificate given in consequence thereof, the sum of one dollar; and for each and every survey on the hull, sails, spars or rigging of any vessel damaged, or arriving at said port in distress, the sum of five dollars; and for each and every certificate given in consequence thereof, the sum of two dollars and fifty cents; and for each valuation or measurement of any vessel, the sum of ten dollars; and the compensation and emoluments of said office shall be divided equally between the said nine wardens composing the Board under this act.

PILOT LAWS IN REFERENCE TO EAST RIVER.

Sec. VI. It shall be lawful for any of the duly authorized Hell Gate pilots to demand and receive from any person who shall employ any of them to pilot any vessel of the burden of ninety-five tons and upwards, or from the consignee or owner of said vessel, from the eastward of Sands' Point or Execution Rocks, or to take charge of any such vessel at or to the eastward of Sands' Point or Execution Rocks, and pilot her to the port of New York, or to pilot her from the port of New York to Sands' Point or Execution Rocks,—for every vessel, one dollar and fifty cents for each and every foot of water such vessel may draw; and from the eastward of Hell Gate to the port of New York, one dollar for each and every foot of water such vessel may draw; and for pilotage from the port of New York to the eastward of either of the before-mentioned points or places, they shall be entitled to receive the same compensation as is above provided when the said vessel is bound to the port of New York. And every pilot shall, for such services, be entitled, in addition to the above-mentioned rates of compensation, to demand and receive the further sum of twenty-five cents for each and every foot of water which any square-rigged vessel may draw, which they shall pilot to or from the port of New York; and every such pilot who shall have piloted any ship or vessel into the port of New York by the way of Hell Gate shall be entitled to a preference in piloting said ship or vessel out of the said port on the next outward voyage of the said ship or vessel, if the said voyage be by the way of Hell Gate. And further, from the first day of November to the first day of April in every year, every such Hell Gate pilot shall be entitled to demand and receive for every ship, bark or brig the sum of two dollars, and for every schooner or sloop the sum of one dollar, in addition to the rates of compensation for pilotage hereby established. And every master or commander of any vessel who shall give to such Hell Gate pilot an untrue account of the draught of water or tonnage of his vessel, shall forfeit and pay the sum of twenty-five dollars, to be sued for and recovered by the Board of Wardens of the port of New York.

Sec. VII. In case any vessel navigating the channel of the East River, commonly called Hell Gate, shall make the usual signal for a pilot, and after making such signal shall refuse to receive on board or employ any such pilot who shall first offer his services after such signal is given, then, and in that case, the master, owner or consignee of such vessel shall pay to such Hell Gate pilot half pilotage from the place or point where such pilot offered his services; and any pilot who shall pilot any Government vessel through the said channel shall be entitled to receive the same compensation therefor as is now provided by law for like service in piloting such vessel to or from the port of New York by the way of Sandy Hook.

Sec. VIII. The master, owner or consignee of any ship or vessel to whom any Hell Gate pilot shall have rendered, upon the request of the master of said ship or vessel, any extra service for the preservation of said ship or vessel, while in distress, shall pay to said pilot, in addition to the compensation set forth in the sixth section of this act, such amount for extra services as the Board of Wardens shall determine to be a reasonable reward; and for every day which any Hell Gate pilot shall be detained on board any ship or vessel over and above twenty-four hours, he may demand and receive from the master, owner or consignee of said vessel, two dollars a day for each and every day he shall be so detained.

Sec. X. This act shall not be construed to apply to steamboats.

The pilot who shall first board any vessel on the North River coming from above Spuyten Duyvel Creek, after leaving her place of loading, shall be entitled to the fees of pilotage, provided said vessel takes a pilot. This rule applies also to vessels from Elizabethport, Newark and Amboy.

The pilot first speaking any vessel coming into port, and tendering his services as a pilot, shall be entitled to the fees of pilotage; provided such pilot shall not, at the time, have another vessel actually in charge.

In no case shall any one pilot take charge of or pilot more than one vessel at the same time, and in all cases shall be on board the vessel under his charge.

Any pilot having a vessel in charge and speaking one down the North River shall give one of the two to the next pilot who may speak the vessel down the North River, provided both vessels go the same tide.

Any pilot having a vessel engaged shall report himself on board of the vessel, to the captain or mates, at least twenty-four hours before the time of sailing, that he is ready to discharge the duty; or otherwise his claim to the vessel will cease.

No pilot shall leave an incoming vessel under his charge until her arrival at the Battery or her place of destination; nor an outgoing vessel until she arrives at the place designated by law, without the consent of the master of such vessel.

Any violation of these rules shall be reported to the Board of Wardens.

QUARANTINE LAWS OF THE PORT OF NEW YORK.

The quarantine stations in the harbor of New York are two in number: Island No. 1, or **Dix Island**, is situated on the eastern edge of the West Bank, two miles and an eighth S. from Fort Tompkins Light-house. This is an artificial erection, covering an area of about two acres, containing five hospitals for the sick and buildings for the physicians, nurses, &c. *Quarantine Stations.*

Island No. 2, or **Hoffman Island**, is one and an eighth miles S. a little W. of Fort Tompkins Light-house, and is also of artificial erection, of an area of three acres. This is the boarding station and is intended for those who have been exposed to sickness but not sick.

The anchorage for vessels under quarantine shall be in the Lower Bay, distant not less than two miles from the nearest shore, and within an area to be designated by buoys by the Quarantine Commissioners and health officer. *Act of April 29, 1863.*

Vessels from any place where disease subject to quarantine existed at the time of their departure, or which shall have stopped at any such place on their voyage, or on board of which during the voyage any case of such disease shall have occurred, shall be detained, should they arrive between the first day of April and the first day of November, in the Lower Bay, below the Narrows. Said boarding station shall be provided with all necessary appurtenances for personal cleanliness and the purification of personal baggage; and all such vessels immediately upon their arrival shall anchor near the boarding station within the "quarantine anchorage" mentioned above, and there remain with all persons arriving thereon.

Vessels arriving at the port of New York shall be subject to quarantine as follows:

1. All vessels from any place where disease subject to quarantine existed at the time of their departure, or which shall have arrived at any such place and proceeded thence to New York, or on board of which during the voyage any case of such disease shall have occurred, arriving between April 1 and November 1, shall remain at quarantine for at least thirty days after their arrival, and at least twenty days after their cargo shall have been discharged; and shall perform such and further quarantine as the commissioners may prescribe, unless the health officer, with the approval of the commissioners, shall sooner grant a permit for said vessel, or cargo, or both, to proceed.

2. From any place (including islands) in Asia, Africa or the Mediterranean, or from any of the West Indies, the Bahamas, Bermuda, or the Azores, or from any place in America, in the ordinary passage from which they pass south of Cape Henlopen, and all vessels on board of which, during the voyage, or while at the port of their departure, any person shall have been sick, arriving between April 1 and November 1, and all vessels from a foreign port not embraced in the first subdivision above, shall, on their arrival at the quarantine ground, be subject to visitation by the health officer, but shall not be detained beyond the time requisite for due examination and observation, unless they shall have had on board, during the voyage, some case of quarantinable disease; in which case they shall be subject to such quarantine and regulations as the health officer and the commissioners may prescribe.

3. All vessels embraced in the foregoing provisions which are navigated by steam shall be subject only to such length of quarantine and regulations as the health officer shall enjoin, unless they shall have had on board, during the voyage, some case of quarantinable disease, in which case they shall be subject to such quarantine as the health officer and commissioners shall prescribe.

Persons with insufficient evidence of effective vaccination, and known to have been recently exposed to small-pox, shall be vaccinated as soon as practicable, and detained until the vaccinia shall have taken effect. No other well persons shall be detained in quarantine any longer than necessary to secure cleanliness. Such vaccination and disposal of persons vaccinated shall be made under regulations to be fixed by the Quarantine Commissioners and health officer.

The only diseases against which quarantine shall apply are yellow fever, cholera, typhus or ship fever and small-pox, and any new disease not now known, of a contagious, infectious or pestilential nature, at the discretion of the Quarantine Commissioners and health officer.

For the purpose of sanitary measures, merchandise shall be arranged in three classes:

1. Merchandise to be submitted to an obligatory quarantine and to purification;
2. Merchandise subject to an optional quarantine; and
3. Merchandise exempt from quarantine.

The first class comprises clothing, personal baggage and dunnage, rags, paper rags, hides, skins, feathers, hair and all other remains of animals, cotton, hemp and woollens. The second class comprehends sugar, silks, and linen and cattle. The third class comprehends all merchandise not enumerated in the other two classes.

With existing quarantinable disease on board, or if there have been any such disease on board within the ten days last preceding, merchandise of the first class shall be landed at the quarantine warehouse. Merchandise of the second class may be admitted to pratique immediately, or transferred to the warehouses, according to circumstances, at the option of the health officer. Merchandise of the third class shall be declared free and admitted without unnecessary delay.

In all cases where there has been quarantinable disease on board during the voyage, letters and papers shall be submitted to the usual purifications; but with such precautions as not to affect their legibility; articles of merchandise, or other things, not subject to purifying measures, in an envelope officially sealed, shall be immediately admitted to pratique, whatever may be the condition of the vessel; and if the envelope is of a substance considered as optional, its admission shall be equally optional.

If a vessel, although not having had during the voyage any case of quarantinable disease, yet shall be found in a condition which the health officer shall deem dangerous to the public health, the vessel and cargo shall be detained until the case shall have been considered. The decision of the health officer, however, shall in all such cases be rendered within twenty-four hours. Vessels in an unhealthy state, whether there has been sickness on board or not, shall not be allowed pratique until they shall have been broken out, duly cleansed and ventilated.

If, in the judgment of the health officer, a vessel needs them, he may order the following sanitary measures: Baths and other bodily care for the person; washing or other disinfecting means for clothing; displacement of merchandise on board or complete breaking out of the cargo; subjection to high steam, incineration or submersion at a distance below the surface of the water for infected articles; destruction of tainted or spoiled food or beverages; complete ejection of water; thorough cleansing of the hold and disinfection of the well;—in short, the complete purification of the vessel in all her parts by the use of steam, fumigation, force-pumps, rubbing or scraping, and finally sending to quarantine anchorage until disinfection is perfected. Whenever the above operations are necessary they shall always be executed before admission to pratique.

No vessel shall be put in quarantine without a stated decision of the health officer; and the captain or master of the vessel shall be informed of the decision immediately; and no vessel subject to quarantine shall depart therefrom without the written permission of the health officer. Such permit shall be delivered by the master of the vessel to the mayor of New York or the mayor of Brooklyn (according to the destination of such vessel) within twenty-four hours after said permit shall be received by said master.

A vessel shall have the right, before breaking bulk, of putting to sea in preference to being quarantined; in the exercise of this right, if the vessel have not arrived at her port of destination, the bill of health shall be returned; the health officer, however, shall mention upon said bill the length and circumstances of the detention, and the condition of the vessel upon re-putting to sea; but before the exercise of this right the health officer must satisfy himself that the sick of such vessel will be taken care of for the remainder of the voyage, and take care of such sick as prefer to remain.

On arrival of infected vessels, all well persons shall have their freedom as soon as possible consistently with the foregoing regulations; sick persons shall be immediately transferred to the floating hospital, or other hospitals appropriated for their reception, and the vessel unladen, purified and admitted to pratique as soon as possible. All merchandise shall be placed in the warehouses, and there freely exposed to the air, and moved from time to time to insure its perfect ventilation. In no case shall persons sick with different diseases be put in the same hospital.

Merchandise coming from different vessels and places, and at different times in quarantine, shall be kept separate and placed as much as practicable in different warehouses.

Merchandise, clothes, &c., shall be submitted to such measures of purification as the health officer shall judge necessary.

A health officer for the port of New York shall be nominated by the Governor, and appointed by him, with the consent of the Senate; and shall hold his office for the term of two years, and until a successor in such office shall be duly qualified.

It shall be the duty of the health officer to reside at such convenient place for the boarding of vessels as the Commissioners of Quarantine may determine, and to have the general superintendence and control of the quarantine establishment, and the care and treatment of the sick, and to carry out all the provisions of this act.

Every master of a vessel subject to visitation by the health officer, who shall refuse or neglect either to proceed with and anchor his vessel at the place assigned at the time of his arrival; or to submit his vessel, cargo, crew and passengers to the examination of the health officer, and to furnish all necessary information to enable that officer to determine to what measures they ought respectively to be subject; or to remain with his vessel at quarantine during the period assigned by the health officer, and, while at quarantine, to comply with the directions and regulations prescribed by law, and with such as any of the officers of health, by virtue of the authority given to them by law, shall prescribe in relation to his vessel, his cargo, himself, his crew or passengers;—shall be guilty of a misdemeanor, and be punished by a fine not exceeding two thousand dollars, or by imprisonment not exceeding twelve months, or by both.

Every master of a vessel hailed by a pilot, who shall either give false information to such pilot relative to the condition of his vessel, crew or passengers, or the health of the place or places from whence he came, or refuse to give such information as shall be lawfully required; or land any person from his vessel, or permit any person, except a pilot, to come on board of his vessel, or unlade or tranship any portion of his cargo before his vessel shall have been visited and examined by the health officer; or shall approach with his vessel nearer to the city of New York or Brooklyn than the place of boarding or anchorage to which he may be directed; shall be guilty of the like offense and be subject to the like punishment; and any person who shall land from any vessel, or unlade or transship any portion of her cargo under like circumstances, shall be guilty of the like offense and subject to the like punishment.

If it shall appear, on inquiry by the pilot, that a vessel has come from a port where any quarantinable disease existed at the time of her departure, or that any case of such disease shall have occurred on board of her during the passage, the pilot shall immediately direct the master of the vessel to proceed and anchor such vessel at the quarantine anchorage in the Lower Bay. In other cases of vessels liable to quarantine, he shall direct their masters to proceed and anchor such vessels at such point as shall be assigned by the Quarantine Commissioners; provided that the anchorage for such vessels shall be at least one-half mile distant from the shore of Long Island and Staten Island.

All passengers being on board of vessels under quarantine shall be provided for by the master of the vessel in which they shall have arrived; and if the master shall omit or refuse to provide for them, or they shall have been sent on shore by the health officer, they shall be maintained by the Commissioners of Quarantine at the expense of such vessel, her owners, consignees, and each and every one of them; and the health officer shall not permit such vessel to leave quarantine until such expense shall have been repaid or secured; and the said Commissioners of Quarantine shall have an action against such vessel, her owners, consignees, and each and every one of them, for such expenses, which shall be a lien on such vessel, and may be enforced as other liens on vessels are enforced, by said Commissioners of Quarantine.

The health officer, upon the application of the master of any vessel under quarantine, may confine in any suitable place on shore any person on board of such vessel charged with having committed an offense punishable by the laws of this State or of the United States, and who cannot be secured on board of such vessel; and such confinement may continue during the quarantine of such person, or until he shall be proceeded against in due course of law; and the expenses thereof shall be charged and collected as in the last preceding section.

The Commissioners of Emigration shall receive into their hospitals all alien passengers for whom bonds shall have been given or commutation paid, under the several acts of this State relating to alien passengers arriving at the port of New York, who shall be affected with any contagious or infectious disease other than yellow fever, and sent to such hospital by the authority of the health officer.

Every person who shall oppose or obstruct the health officer or his deputies in performing the duties required of him by law, and every person who shall go on board of, or have any communication, intercourse or dealing with, any vessel under quarantine, or with any of her crew or passengers, without the permission of the health officer, or who shall, without such permission, invade any portion of the quarantine establishment, shall be guilty of the like offense and subject to the like punishment prescribed by the preceding ninth section of this act; and such offender shall be detained at quarantine so long as the health officer shall direct, not exceeding twenty days. In case such person shall be taken

sick of any contagious or infectious disease during such twenty days, he shall be detained at quarantine for such further time as the health officer shall direct. Exclusive jurisdiction of the offenses specified in this section is hereby conferred upon the courts specified in the forty-ninth section of the act which is hereby amended, and all the provisions of said last-mentioned section shall apply to said offenses.

The Commissioners of Emigration shall, by the order and direction of the health officer, receive and take charge of all passengers arriving at the port of New York who shall have been exposed to the infection or contagion of small-pox or ship fever, to be kept elsewhere than on Staten Island; and the said Commissioners of Emigration, for the purpose of defraying the expenses therefor, shall be entitled to receive from the owners, masters, consignees or agents of the vessels arriving at the port of New York the sum of twenty-five cents for each passenger so arriving, to be collected in the same manner that commutation moneys are collected by said Commissioners of Emigration.

The following quarantine and other fees are paid on entering a vessel at the custom-house, viz:

Health officer's fees, each vessel	\$6 50
U. S. Hospital fees, per head	20
State Hospital fees, per head	1 00
Master's Hospital fees, per head	1 50
Tonnage dues, per ton (yearly)	30
Harbor-master's fees, per ton	01 $\frac{1}{2}$

The master, chief officer, owner, consignee or physician of every vessel arriving at or lying within the sanitary district, (not being in quarantine or within quarantine limits,) shall at once and daily cause to be reported to the Board of Health, in writing, the name, disease, condition, and all other useful information concerning any person on board such vessel who has been or is sick of a contagious disease, and the facts as to there having been any infected person or thing aboard such vessel.

No person sick of a contagious disease shall be removed from any vessel to the shore without a permit from this board. And no person having charge of any vessel shall remove or aid in removing a person sick of, or who has been exposed to, any contagious disease, nor any articles that have been exposed to the contagion of any such disease, (except into the quarantine grounds by direction of the health officer,) without a permit from the Board of Health.

No master, charterer or consignee shall allow (having power and authority to prevent) any vessel, or person, or article therefrom, from an infected port, or liable to or having been in quarantine, to come or be brought nearer than 300 yards from any part of the sanitary district, without a permit from the Board of Health.

No person shall bring any person or thing into any part of the sanitary district from any infected place or land; or from any vessel lately from an infected port, or in which has lately been a person sick of a contagious disease, (though the same may have passed through quarantine,) without a permit from the Board of Health.

If any vessel shall bring into the sanitary district, between the first of May and the first of November, any cotton in a dangerous, infected or unsound condition, the same must be at once reported to the Board of Health.

No vessel or cargo which shall or should have obtained a permit to pass quarantine, or to come up to the water front of New York or Brooklyn, shall unlade or land any part of such cargo in either of said cities, without a written permit from the Board of Health. Such permits shall be obtained, for the city of New York, of the superintendent of the said board, at 301 Mott street, and for the city of Brooklyn, of the assistant sanitary superintendent, at the court-house in Brooklyn.

RULES AND REGULATIONS OF THE BOARD OF HARBOR MASTERS.

The following are the rules and regulations established and adopted by the Board of Harbor Masters of the port of New York, and approved by the Captain of the Port, July 1, 1865:

No vessel shall be moored in the stream of the East or North river nearer than three hundred yards from the docks of the city of New York, from the first day of May to the first day of October.

All vessels having on board gunpowder, when moored or anchored in the harbor, shall hoist and keep hoisted a red flag in the rigging during the time they are discharging or receiving the same.

No vessel shall be anchored within the following limits, from the first day of April until the first day of January in each year: Commencing at pier 4, North River; thence five hundred yards west; thence southerly, in a straight line, four hundred yards west of the northerly point of Governor's Island, one mile. And no vessel shall be anchored in the entrance to the East River west of pier 10, East River.

All vessels lying at anchor in the night-time, in the Hudson River north of The Battery, or in the harbor of New York, or in the bay thereof as far as the village of Castleton, Staten Island, or in the East River as far as the south point of Blackwell's Island, "the masters of such vessels shall cause the peaks to be lowered, if the sails be up, and shall cause good and sufficient lights to be shown in some part of the rigging, at least twenty feet above the decks and from the taffrails."

For a non-compliance with the provisions of the above section, the masters and owners of such vessels so offending shall be liable to a penalty of fifty dollars. In case such penalty cannot be collected from the master, the owners of such vessel, jointly and severally, shall be liable therefor in the same manner as if they were sureties of such master.

All vessels lying at the wharves or piers, or in the basins or slips, shall, unless otherwise directed, lie with their heads up the docks. Those on the east side of the docks to have their yards topped by their port lifts, the crown of their starboard anchor taken in on the forecastle, and their port cable bent and clear. Those on the west side to have their yards topped by their starboard lifts; * * the palms of their port anchor taken in on the forecastle, and their starboard cable bent and clear. Those lying on either the east or west side of the docks shall have the movable fore and aft spars and spritsail yards rigged in; their stern davits, quarter davits, bumpkins and martingales unshipped.

The position of vessels is not to be changed without special permission from the Harbor Masters, except to paint or bend sails.

Vessels lying in the North River (Hudson).—Those lying on the south side of the docks to have their yards topped by their port lifts; those on the north side to have their yards topped by their starboard lifts. Those on the south side to have the palm of the starboard anchor taken in on the forecastle, and their port cable bent and clear; those on the north side to have their port anchor on the forecastle, and their starboard cable bent and clear.

Applications for berths must be made to the Harbor Master of the district where the berth may be desired, stating where the vessel lies.

No vessels shall exchange or dispose of their berths without the permission of a Harbor Master.

All vessels at the end of wharves or piers shall haul either way, as best to accommodate vessels going in or coming out from such wharves or piers.

All vessels, not discharging or receiving cargoes, shall make room for those needing more immediate accommodation.

Vessels returning, or putting into port in distress, shall be accommodated with berths as soon as practicable.

All vessels shall have on board a ship-keeper to take charge of them.

If no person be found on board any vessel which may be required to remove, the Harbor Master shall cause the same to be done at the expense of the master, owner or consignee, who shall also be liable for all damage caused by such vessel.

No vessel shall be moored, anchored or fastened so as in any wise to obstruct or interfere with the ferry-boats of the city.

No pitch, tar or other combustible shall be heated on board any vessel lying at any wharf, pier, slip or basin of this city; but the same shall be done on floating stages or boats, or on the bulkheads, and with a bucket of water always ready for use.

No vessel shall hoist a stern-boat, quarter-boat, or boat of any kind, under the bowsprit.

All captains, or persons in charge of all vessels of less than one hundred tons burden, schooners, sloops, canal-boats, barges or lighters, are required to move from time to time, to accommodate any vessel, schooner, sloop, canal-boat, barge or lighter in or out of the slip, or within the same. Any refusal or neglect to comply with this requirement will subject them to pay a fee of two dollars, provided the Captain of the Port or a Harbor Master is called upon to make such removal.

A refusal to comply with any of the foregoing rules and regulations renders the party subject to a penalty of fifty dollars for each offense, and for all damages, with costs of suit.

In case of absence of any Harbor Master from his district, the Captain of the Port will assign another Harbor Master to the district during such absence.

APPENDIX III.

GULF OF MAINE AND EAST COAST OF CAPE COD.

CURRENTS BETWEEN CAPE ANN AND CAPE COD.

The accurate and skillful observations of Master Robert Platt, U. S. N., Assistant in the Coast and Geodetic Survey, on the coast of Massachusetts between Cape Ann and Cape Cod, made between the months of June and October, 1877, have been carefully reduced and discussed by Assistant H. L. Marindin under the direction of Assistant Henry Mitchell, Chief of Physical Hydrography, and the results embodied in the following table and its accompanying explanation. As was to be expected, and as has been stated elsewhere in the several editions of the Atlantic Coast Pilot, but little current was found; and that, mainly tidal.

In the discussion of the "Currents of the Gulf of Maine," (see Appendix I,) Mr. Mitchell, in his report to the Superintendent, clearly shows that "a horizontal movement of the ocean in a northeasterly direction preceded the rise in the Gulf of Maine and the Bay of Fundy." It is easily seen by an inspection of the chart that the eastern coast of Cape Cod is sheltered from this movement; and, therefore, that there is hardly any current of flood along this shore, while that of ebb is quite strong.

It is difficult, considering the sluggish nature of the current, to enter into any elaborate discussion of its direction and velocity; but what can be safely stated, with the means at his disposal, is embodied in the following extracts from Mr. Mitchell's report under date of April 20, 1881, and in the accompanying table:

CURRENTS ON STELLWAGEN'S BANK AND IN ITS VICINITY.

Over Stellwagen's Bank, and in the channel between it and Cape Cod, the current of ebb (easterly) begins to run from half an hour to one hour *before* the time of high water at Boston. Three hours *after* that high water the *strength* of the current of ebb is reached; and then (at that time) it runs three-quarters of a mile in an hour, about E. by N. About six hours *after* the time of high water at Boston the ebb slacks; and, soon after, the current turns in the opposite direction. Three hours later (between the ninth and tenth hours *after* the time of high water at Boston) the *strength* of the current of flood is reached, with a velocity of nearly three-quarters of a mile in a W. by N. direction.

CURRENTS ON THE EASTERN COAST OF CAPE COD.

The tidal current on the eastern shore of Cape Cod has a southerly flow during nine hours out of the twelve—viz: From two hours *before* until seven hours *after* the time of high water at Boston. Between one and three hours *after* the time of high water, as above, the *velocity* is about one mile in an hour, following the general trend of the coast to the southward. In the interval between the seventh and tenth hours *after* the time of high water at Boston the current is feeble in strength and uncertain in direction.

APPENDIX III.

CURRENT TABLE.

RATE AND DIRECTION OF CURRENT FOR EACH TIDAL HOUR AFTER TIME OF HIGH WATER AT BOSTON.								
LOCALITY.	O ^h		I ^h		II ^h		III ^h	
	Rate, Knots.	Direction.	Rate, Knots.	Direction.	Rate, Knots.	Direction.	Rate, Knots.	Direction.
Eight miles off Chatham Light-houses	0.8	S SW.	1.0	SW. by S. $\frac{1}{2}$ S.	0.8	SW. by S.	0.5	SW. by S.
Seven miles off Nauset Light-houses	0.6	S SE.	0.8	S SE.	0.8	S SE.	1.0	SE. by S. $\frac{1}{2}$ S.
Five miles off Highland Light-house	0.6	SE. $\frac{1}{2}$ S.	0.8	SE.	0.9	SE. by S.	0.8	SE. by S.
In the channel between Race Point and Stellwagen's Bank	0.4	E NE.	0.7	E. $\frac{1}{2}$ N.	0.8	E. by N.	0.8	E. by N.
On Stellwagen's Bank	0.6	E NE.	0.7	E. by N. $\frac{1}{2}$ N.	0.7	E. by N. $\frac{1}{2}$ N.	0.8	E. by N.
Ten miles to the southward of Cape Ann	0.2	W NW.	0.3	NNW.	0.2	NNW.	0.2	N NE.
† Six miles to the southward of Cape Ann	0.3	SE. by S. $\frac{1}{2}$ S.	0.3	SE. by E. $\frac{1}{2}$ E.	0.4	SE. by E. $\frac{1}{2}$ E.	0.3	SE. $\frac{1}{2}$ E.
	IV ^h		V ^h		VI ^h		VII ^h	
Eight miles off Chatham Light-houses	0.3	SW.	0.2	NE. by E. $\frac{1}{2}$ E.	0.3	NE. by N. $\frac{1}{2}$ N.	0.6	W SW.
Seven miles off Nauset Light-houses	0.9	S.	0.6	S. by W. $\frac{1}{2}$ W.	0.3	SW. by S.	0.1	E. $\frac{1}{2}$ N.
Five miles off Highland Light-house	0.8	SE. $\frac{1}{2}$ S.	0.7	SE. by S.	0.8	S SE.	0.2	SW. by S. $\frac{1}{2}$ S.
In the channel between Race Point and Stellwagen's Bank	0.7	E. by N. $\frac{1}{2}$ N.	0.5	NE. by N. $\frac{1}{2}$ N.	0.2	E. by N.	0.4	SW. by W. $\frac{1}{2}$ W.
On Stellwagen's Bank	0.7	E.	0.3	E. by S.	0.2	SE.	0.5	W SW.
Ten miles to the southward of Cape Ann	0.3	N NE.	0.4	NE. by N. $\frac{1}{2}$ N.	0.2	NE. by N. $\frac{1}{2}$ N.	0.2	E SE.
† Six miles to the southward of Cape Ann	0.2	SE. $\frac{1}{2}$ E.	0.2	SE. by E.	0.2	S SW.	0.2	SW. by S.
	VIII ^h		IX ^h		X ^h		XI ^h	
Eight miles off Chatham Light-houses	0.3	W.	0.3	SW.	0.3	S. $\frac{1}{2}$ W.	0.5	SW. by S.
Seven miles off Nauset Light-houses	0.2	NE. by E. $\frac{1}{2}$ E.	0.2	NE. by E.	0.2	SE.	0.4	SE. by S.
Five miles off Highland Light-house	0.3	W. by S. $\frac{1}{2}$ S.	0.2	SW. $\frac{1}{2}$ W.	0.3	SW. by S.	0.4	SE. by S.
In the channel between Race Point and Stellwagen's Bank	0.5	SW. by W. $\frac{1}{2}$ W.	0.7	W. $\frac{1}{2}$ N.	0.6	W.	0.3	E SE.
On Stellwagen's Bank	0.6	W. $\frac{1}{2}$ S.	0.6	W. by N. $\frac{1}{2}$ N.	0.6	NW. by N.	0.6	N. $\frac{1}{2}$ E.
Ten miles to the southward of Cape Ann	0.4	W SW.	0.5	W SW.	0.6	W.	0.4	W NW.
† Six miles to the southward of Cape Ann	0.2	SW. $\frac{1}{2}$ W.	0.2	W. by S.	0.2	SW. by W.	0.2	S. $\frac{1}{2}$ W.

† The observations at these stations are doubtful, owing to the prevalence of heavy gales at the time they were made.

INDEX.

	Page.
Abbott's Rock	295
Abbottsford, Village of	596
Abiel's Ledge	198
Acabemock Harbor	535
Acushnet River	239-243
Acushnet River	205
Adam's Fall	449
Adam's Point	294
Adamsville, Village of	240
Agawan, Village of	190
Albany, City of	609
Albertson's Point	538
Alderidge's Ledge	21, 26
Allen's Point	489
Allen's Rock, (Edgartown Harbor)	161
Allen's Rock, (Warren River)	295
Allerton, Point	2, 13
Allyn's Wharf	419
Almy's Point	246
Alvord's Beach	361
Amagansett, Village of	550
America Ledge	273
Americus Club House	370, 490
Anchorage:	
Under Black Point, (Long Island Sound,) 424; between Black Point and Hatchett's Point, 424-426; off Branford Point, 401;—	
Eastern Side of Horse Island, 400; Eastern Side of Long Neck Point, 387; Eastward of Flagg and Ball Islands, 401;—	
Off Four Mile River, 424-426;—	
Under Hammonasset Point, 439; Hart and City Islands, 389; High Island and the Bare Islands, 400;—	
Kidd's Island and Horse Island, 400;—	
Off Madis- son, 400;—	
Westward of Brown's or Haycock Point, 400-401; off Whitestone Creek, 423-424.	
Anderson School of Natural Science	187
Andrews' Dock	601
Angelica Point	191, 295
Anthony's Nose	598
Anthony's Point	246
Apple Island	3
Apple Island Flats	32, 34
Apponagansett Bay	190, 205, 219-224
Apponagansett River	219
Apponaug, Village of	272, 292
Apponaug River	292
Aquebogue Flats	543
Army Hospital, (Ward's Island)	521
Arsenal at Watervillet	609
Arthur Kill	557, 587-588
Asia Rip	177
Astoria, Town of	522
Astor's Point	604
Athens, Village of	606
Atlantic Docks, (Tompkinsville)	558
Aucoot Cove	191
Austin's Hollow	269
Austin's Rock	608, 615
Avery's, Village of	409
Avery's Point	347, 408
Avery's Point Shoal	417
B.	
Babylon, Village of	552
Back River:	
(Buzzard's Bay,) 190; (Connecticut River,) 349, 427; (Duxbury Bay,) 63.	
Back or Western Way, (Boston Harbor)	40-42
Baker's Cove	347
Baker's Island	311

	Page.
Baldheaded Billy	552
Ball Island, (off Jeffrey's Point)	357, 441
Ball Island Ledge	442
Balmville, Village of	600
Bar Neck	146
Barcelona Bank	539, 547
Barcelona Bank Shoal	547
Barcelona Point	539
Bar's Rock	601
Bare Island	356
Bare Island, Little	356
Bare-kneed Rock	220
Barker's Point	368, 506
Barney's Joy Point	186
Barney's Point	233
Barnegat, Village of	601
Barnstable, Village of	68
Barnstable Harbor	68-71
Barnstable Harbor Bar	69
Barrel Rock	55
Barren Island, (Hudson River)	607
Barren Island, (Rockaway)	553
Barretto's Cove	519
Barretto's Point	519
Barrington River	294
Barrytown, Village of	604
Barrytown Flats	613
Barrytown Landing	604
Barstow's Rock	227, 229
Bartlett's Reef, (Fisher's Island Sound)	332
Bartlett's Reef, (Long Island Sound)	348, 376, 389, 420
Bartlett's Reef Light-vessel	348, 376, 389, 419, 420
Bartlett's Rock	60, 63
Base Island	609
Base Island Dike	609
Bass Creek	69
Bass Ledge	119
Bass Point	42
Bass Point or Gull Point Flats	49
Bass Rip	176
Bass River	83, 131-132
Bass River Roads	131-134
Bass Rock	64
Bassett's Island	189
Bath, Village of	609
Battery, The	623, 554
Baxter Rock	70
Bayside Beacon	556, 594
Beach Channel, (Moumoy)	91
Beach Point	65
Beach Point Rock	234
Beacon Hill	304
Beacon Island, (Hingham Harbor)	52
Beacon Island, (Hudson River)	609
Beacon Point, (Norwalk)	362, 479
Bear Island	608
Bear Island Light	608, 620
Bear Point	256
Bearse's Rock	140
Bearse's Shoal	91
Beaver Head	251, 269, 285
Beaver Tail, The	251, 254, 269
Beaver Tail Light-house	251, 254, 266, 303
Beaver Tail Point	251, 268
Beaver Tail Point Shoal	286
Bedford Reef	308, 346, 541
Bedloe's Island	559
Beebe Rock	549
Bellport, Village of	552
Bellport Bay	552
Bennet's Neck	189-190
Ben's Point	536
Bent's Ledge	224

B.	Page.
Bent's Point	48
Bent's Point, Village of	48
Bergen Flats	563, 592-593
Bergen Highlands	596
Bergen Middle Ground	592
Bergen Neck	559, 591
Bergen Point	558
Bergen Point, Village of	559
Bergen Point Light-house	591, 593, 594
Bergen Point Reef	591, 592
Berkshire Pond	359
Berrian's Island	520
Berry Rock	231
Betts' Island, (Norwalk Islands)	363, 471
Bibb Rock	73
Big Boll, The	448
Big Channel	553
Big Fishkill Channel	553
Big Fishkill Hassock	553
Big Rock Point	608
Big Tom	374, 384, 512, 515
Bight, The	597
Bill Dyer's Rock	280, 290
Billingsgate Flat	73
Billingsgate Island	72
Billingsgate Island Light-house	72, 75
Billingsgate Shoal	73
Bird Island, (Boston Harbor)	10, 23, 28, 35
Bird Island, (Buzzard's Bay)	192, 229
Bird Island Beacon	10, 23, 28, 35
Bird Island Flats	9-10, 23, 28, 35
Bird Island Light-house	192, 229, 232, 239
Bird Island Reef	197, 233
Bird Reef	443, 444-445
Bishop and Clerk's Light-house	84, 94, 133, 135, 139
Bishop and Clerk's Shoal	84, 94, 133, 135
Bishop Rock	255
Bishop Rock Shoal	255, 261, 283
Bishop's Rocks	611
Black Bank Channel, (Barnstable)	69
Black-boy Rock	348, 377, 389, 424, 425
Black-boys, The	348, 377, 424
Black Fish Creek	72
Black Ledge, (Cohasset)	55
Black Ledge Beacon	413, 416
Black or Southeast Ledge	347, 413, 416-417
Black Point:	
(Long Island Sound,) 348, 419; (Narragansett Bay Approaches,) 273; (Sakonnet River,) 244.	
Black Rock, Village of	360, 461
Black Rock:	
(Boston Harbor,) 39; (New Bedford Harbor,) 200; (New Haven Harbor,) 450; (New London Harbor,) 414; (Niantic Bay,) 422; (Sippican Harbor,) 231; (Wickford Harbor,) 290.	
Black Rock Channel, (Boston Harbor)	39-40
Black Rock Harbor	300, 460-463
Black Rock Light-house	300, 461, 463
Black or Huncher's Rock	460, 461
Black or Huncher's Rock Beacon	381, 458, 460, 461
Black Rocks	13
Blackhall, Village of	349, 427
Blackhall Point	349, 427
Blackhall River	349, 427
Black's Creek	47
Blackwell's Dock	532
Blackwell's Island	522-523
Blackwell's Island Light-house	523, 535
Blackwell's Island Reef	526
Blank Rock	230
Blankenship's Cove	230
Blind Rock	70
Blith Point	69
Block Island	304-306
Block Island Basin	305
Block Island Channel	403-408, 578
Block Island North Light-house	305
Block Island North Reef	374-375
Block Island Sound	304-310, 403-408
Block Island Southeast Light-house	305
Blue-Bah Reef	483, 493
Blue-fish Reef Shoal	382, 482-483, 497
Blue Hills	24

B.	Page.
Blue Point, (Great South Bay)	552
Blue Point, (Hudson River)	601
Blue Point, Village of	552
Bluff Island, (Greenwich Cove)	491
Bluff Island, (off Pattaguansett River)	348, 424
Bluff Island Ledge	491
Bluff Point, (Northport Harbor)	477-478
Bluff or Mumford's Point	314
Blunt's Island	601
Blyn Rock	357, 441
Bogart's Island	609
Bolgers, The	510, 513
Bolles' Hill	409
Bolles' Island, (Hudson River)	601
Bonnet Point	270
Borden's Flats	302
Boston, City of	5, 13, 25
Boston Bay	1-57
Boston Harbor	1-44
Boston Ledge	5
Boston Light-house	2, 53
Bostwick's Bay	308, 408, 635
Bottoms and Characteristic Soundings on Nantucket Shoals and their Approaches	178-179
Bourne's Neck	190
Bow Bells, The, (Buzzard's Bay)	197, 239
Bowers' Island	371
Bowery Bay	529
Bowery Bay Point	319
Bradford's Cove	357
Bradford's or Bam Island	312
Braintree Neck	48
Brando Point	606
Brando Point Shoal	615
Branford, Village of	356, 357, 442
Branford Creek	357, 442
Branford Harbor	357, 441-445
Branford Point	357, 441
Branford Reef	379, 394, 395, 442, 444
Branford Reef Beacon	379, 394, 442, 444
Brant Point	158
Brant or Green Harbor Point	60
Brant Point Light-house	158, 169
Brayton Point	301
Bread and Cheese Reef	523
Breakneck Point	589
Breakwater Beacon	63
Breakwater Point	244
Brenton's Cove	279
Brenton's Cove Rock	280
Brenton's Point	250
Brenton's Reef	259, 260, 279
Brenton's Reef Light-vessel	253, 269, 303
Brewster, Village of	72
Brewster or Spit Bar	2, 7, 39
Briar Islands	511
Brick-yard Creek	306, 388
Brick-yard Wharf	603
Brick-yards, The	486
Bridge Port, The	245
Bridgeport, City of	359, 457
Bridgeport, East	457
Bridgeport Harbor	359-360, 457-460
Bridgeport Harbor Light-house	360, 457, 453
Brig Ledge	274, 290
Bristol, Town of	297
Bristol Ferry Light-house	297, 300, 303
Bristol Ferry Point	297, 300
Bristol Harbor	296-300
Bristol Neck	297
Broad Cove	51
Broken Ground of Horse-Shoe Shoal	90, 105, 107, 112
Broken Land, The	395
Broken Part of Bartlett's Reef	490
Broken Part of Pollock Rip	90, 103, 109-110
Broken Part of The Handkerchief	95
Broken Rip	103, 110
Bronx Island	607
Bronx River	519
Brook Village	71
Brooklyn, City of	523, 564
Brooklyn Bridge	229

INDEX.

III

B.	Page.
Brooklyn Navy Yard	523
Brothers, The:	
(off Darien,) 474; (East River,) 520; (off Four Mile River,) 424;	
(Hudson River,) 599, 611; (Narragansett Bay,) 273; (Wick-	
ford Harbor,) 289.	
Browning's Hill	410
Brown's Bank or Brown's Island	62, 63-64
Brown's Hills, (Long Island)	352, 536
Brown's Hills, (Plum Island)	347
Brown's Point, (Orient Harbor)	537
Brown's Point, (Sakonnet River)	244
Brown's Point or Haycock Point	356
Brown's Reef, (off The Thimbles)	379, 394-395
Brush Island	55
Brush Island Channel, (Cohasset Harbor)	55-56
Brush Island Ledge	55
Brush Neck Cove	292
Budd's Reef	385
Bulkhead Rock	258
Bulkhead Rock Shoal	264
Bull Hill	599
Bull Point	252, 254
Bullock's Creek	257
Bullock's Neck	257
Bullock's Point	257
Bullock's Point Light-house	257, 303
Bullock's Point Shoal	264
Bumkin Island	51
Bumkin Island Shoals	52
Bunker Hill Monument	25
Bush Hill	304
Bush Island	311
Bush Ledge	355
Bush Rock	232
Bush's Harbor	370, 388, 495
Bushy Point	347
Butler's Flats	208, 216
Butler's Hole Passage, (Monomoy)	103
Butter-Ball Rock	260, 279
Butter Hill	600
Buttermilk Bay	190
Buttermilk Channel	523, 529-530, 559
Buttermilk Falls	599
Button Island	52
Butts' Hill	245
Buzzard's Bay	185-239
Byram Point	371, 497
Byram Point Ledge	498
Byram River	371, 497-499
Byram Rocks	498

O.	Page.
Caldwell's, Village of	598
Calf Island, (Boston Bay)	18
Calf Island, (Greenwich Cove Approaches)	493
Calf Island, Little, (Boston Bay)	18
Calf Island Reef	493, 496
Calf Islands or The Calves, (Great Captain's Island Harbor)	371, 496
Calf Pasture Islands	363, 467, 471
Calf Pasture Point	362, 471
Calves' Island, (Connecticut River)	427
Calves' Island Beacon	427
Calves' Pasture Point	69
Calves, The, (Great Captain's Island Harbor)	371, 496
Cambridge, City of	5
Campbell's Bar	608, 615
Campbell's Island	608
Canal Flats	166
Canapisset Gut	89, 187, 201
Canarsie Landing	553
Cape Cod	61-62
Cape Cod Bay	61-79
Cape Cod or Highland Light-house	61, 78, 79-80
Cape Higgon	86
Cape Poge	85, 160
Cape Poge Bay or Pond	85, 160
Cape Poge Flats	113-114, 120, 161
Cape Poge Light-house	85, 124, 160, 164
Captain's Flat	64-65
Captain's Hill	65
Captain's Island, Great	371

O.	Page.
Captain's Island, Little	371
Carmel, Mount	351, 358, 446
Carpenter's Neck	502
Carpenter's Point	502
Carr's Point	256
Cartbage, Village of	600
Castle Garden	523, 559
Castle Hill	254
Castle Island, (Boston)	4
Castle Island Beacon	299
Castle Island Shoal	299
Castle Rocks	9, 22, 27
Castleton, Village of	608
Castleton Bar	608, 615
Castleton Dike	607
Cataumet Harbor	186, 239-237
Cataumet Ledge	236
Catskill, Village of	605
Catskill Creek	605
Catskill Mountains	602
Catskill Station	606
Catskill Steamboat Landing	615
Catumb Passage	314, 323-324
Catumb Rocks	323
Cave Point	602
Caven's Point	559
Cedar Creek	470
Cedar Hammock	470
Cedar Hill	608
Cedar Hill Point	608
Cedar Hill Point Flats	608
Cedar Hill and Schermerhorn Dike	608
Cedar Island, (Gardiner's Bay)	536
Cedar Island, (Sakonnet River)	246
Cedar Island Light-house	536, 550
Cedar Island Pond	246
Cedar Point:	
(New Haven Harbor Approaches,) 358, 453; (Saugatuck River,) 361, 466; (Scituate,) 58; (Shelter Island Sound,) 536.	
Cedar or Welch's Point	358, 459
Cedar Point Reef, (off Milford)	380, 453
Cedar Point Shoal, (Scituate)	58
Cedar Point Shoal, (Gardiner's Bay)	545-546
Cedar Tree Neck	86
Cedar Swamp Ledge	289
Cement Works, The	603
Centre-board Shoal	230-231
Centre Hill Point	68
Centre or Hog Island	367, 486-487
Centre Island Beach	367, 486
Centre Island Point	367, 486
Centre Island Reef	367, 382, 488
Centre Island Shoal	366, 488
Centreport, Village of	477
Centreport Beach	477
Centreport Harbor	477
Centreville, Village of, (Massachusetts)	84, 139
Centreville, Village of, (New Jersey)	559
Centreville Harbor	84, 139-143
Centurion Rocks or The Centurion	7, 15, 42
Cerberus Shoal	375, 404
Champlin's Creek	552
Chandler's Island	51
Channel between No Man's Land and Martha's Vineyard	124-128
Channel Rock:	
(Barnstable,) 70; (Byram River,) 498; (Cataumet,) 237; (Centre-	
ville,) 140, 142; (Cockenoe's Island Harbor,) 468; (Fisher's	
Island Sound,) 326; (Hingham,) 52; (Weymouth Fore	
River,) 49.	
Chapel Hill Beacon	556, 594
Chappaquiddick Flats	162
Chappaquiddick Island	85, 160
Chappaquiddick Point	85, 160
Characteristic Soundings and Bottoms on Nantucket Shoals and	
their Approaches	178-179
Charles' Island, (off Milford)	358-359, 390, 453
Charles' Island Rocks	453-454
Charles' Neck	181, 230
Charles' Reef, (off Madison)	392, 435
Charles River	5
Charles' Rock	380
Charlestown, City of	5

	Page.		Page.
Charlestown Inlet	306	Closter Landing	596
Charlestown Navy Yard	5	Clumps, The	474
Charts:		Coal Bed, The	614
Block Island Sound—from Point Judith to Narragansett Beach, faces page 308; Boston Bay and Harbor, faces page 44; Buzzard's Bay, faces page 200;—		Coal Mine Point	250, 256
Coast from Cuttyhunk to Point Judith, faces page 244;—		Coal Mine Rock	262, 237, 301
Fire Island Inlet, faces page 552;—		Coast from Scituate Entrance to Cape Cod Bay	59-60
Gulf of Maine—Current Stations, faces page 184;—		Coast from Strawberry Point to Scituate Harbor	57-58
Long Island Sound—Eastern Entrance, faces page 356; Long Island Sound—from Falkner's Island to Stratford Point, faces page 384; Long Island Sound—from Norwalk River to Throg's Neck, faces page 406; Long Island Sound—from Plum Island to Falkner's Island, faces page 370; Long Island Sound—from Stratford Point to Norwalk River, faces page 396;—		Coast from Westport Harbor to Sakonnét River	243
Nantucket Sound—Eastern Entrance, faces page 102; Nantucket Sound—Western Part, faces page 116; Nantucket and Vineyard Sounds—Cross Rip to Nobska Point, faces page 144; New York Approaches, faces page 576; New York Entrance, faces page 566;—		Coaster's Harbor	250, 255
Provincetown Harbor, faces page 78;—		Coaster's Harbor Island	250, 255
Vineyard Sound—Wood's Hole to Cuttyhunk, faces page 150.		Coatue Beach	158
Chase Gardner's Creek	72	Coatue Flats	158
Chatham, Village of	81	Coatue Point	158
Chatham Bar	80, 90	Cockonoe's Island	362, 467
Chatham Harbor	60	Cockonoe's Island Harbor	362, 467-469
Chatham Light-houses	62, 81	Cockonoe's Island Shoal	361, 466
Chatham Roads	83, 126-131	Coddington Cove	250, 255
Chatman's Point	45	Coddington Point	250, 255
Chatman's Point Flats	45-46	Cocles' Harbor	537
Cheeseman's Hill	502	Cocles' Island	537
Chelsea, Town of	5	Coenties' Reef	527
Chelsea Bridge	5	Coeyman's, Village of	607
Chelsea Landing, (Arthur Kill)	557	Coeyman's Bar	615
Chelsea River	5	Coeyman's Bar Light	607, 620
Cherry Neck	250	Coeyman's Dike	607
Chest Ledge	37	Coffin Rock	150
Chimney, Corner, The	370	Coggeshall's Cove	253, 271
Chimney Corner Reef	393, 437, 440	Coggeshall's Ledge, (South Coast of Rhode Island)	250
Chimney Sweeps, The	374, 511, 512	Coggeshall's Ledge, (West Coast of Rhode Island)	261-262
Chimneys, The	448	Coggeshall's Point, (South Coast of Rhode Island)	250
Chimon's Island	362, 471	Coggeshall's Point, (West Coast of Rhode Island)	256
Chippauguet Island	292	Cohasset, Town of	33
Chippauguet Island Shoal	293	Cohasset Harbor	13, 55-57
Chittenden's Rock	55	Cohasset Narrows	180
Chocomount, (Fisher's Island)	307, 310, 312	Cohasset Rocks	12, 37
Cholera Bank	576	Coit's Cove	409
Christianpoll Marsh	553	Cold Spring, Village of, (Hudson River)	599
Chubby Bluff	160	Cold Spring, Village of, (Long Island Sound)	366, 486
Church Cove	244	Cold Spring Beach	289
Church Point	244	Cold Spring Harbor, (Hudson River)	569, 611
Church Point Reef	246-247	Cold Spring Harbor, (Long Island Sound)	366, 486
Church Rock, (Barnstable)	70	Cold Spring Rock	289
Church Rock, (New Bedford)	208, 212, 223	Cole's River	301
Church's Cove	300	College Point	519
City Island	373-374, 512, 515	College Point Reef	524
City Island Flats	512	Collter's Ledge	95, 137, 141
City Island Harbor	511-513	Colomore's Ledges	37, 38
City Island Shoal	384, 515	Columbiaville, Village of	606
Clam Shell Beach	477	Colyer's Point	389
Clarke's Cove, (Thames River)	410	Commercial Point	44
Clark's Cove, (New Bedford)	190, 205, 224-225	Commercial Wharf	44
Clark's Island	62	Commissioners' Ledge	25
Clark's Point, (New Bedford)	190, 205	Common Fence Point	246, 250, 301
Clark's or Oyster River Point	358, 445	Common Fence Point Shoal	302
Clark's Point Light-house	191, 205, 225, 239	Common Flats	127, 130
Clark's Point Shoal	208, 215-216	Communipaw, Village of	559
Clason's Point	519	Communipaw Docks	559
Clay Head	304	Compo Hill	361
Clay Point	313	Conanicut Island	250-252, 268
Cleaves' Point	537	Conanicut Point	557
Cleaves' Point Shoal	542	Conanicut Point Flats	589
Clermont Wharf	605	Conc Rock	70
Cliff Beacons, (Nantucket)	159	Coney Island	553
Clifton, Village of	658	Conimicut Light-house	257, 303
Clifton Hills	558	Conimicut Middle Ground	263, 275
Clifton or Garretson's Point	608	Conimicut Point	257
Clinton, Village of	351, 434	Conimicut Point Shoal	257, 263
		Conking's Point	638
		Connecticut Lake	426
		Connecticut River, (Long Island Sound)	349, 426-429
		Connecticut River, (South Coast of Long Island)	582
		Connetquot Brook	552
		Connetquot Cove	552
		Conover Beacon	556, 594
		Con's or Conner's Hook	599
		Con's Hook Shoal	611
		Conscience Bay	464
		Constable's Point	558
		Constellation Rock	399, 405, 641
		Constitution Island	599
		Cook's Point	457
		Coon's Ledge	290

INDEX.

V

C.	Page.
Cooper's Bluff	487
Cooper's Hill	353
Coot Rock, Inner	432
Coot Rock, Outer	432
Coot Rocks	432
Copps' Island	362, 471
Corey's Wharf	245
Cornel Reefs	493, 496
Cormorant Ledge, (Sakonnet River Approaches)	249
Cormorant Reef, (Fisher's Island Sound)	235, 341
Cormorant Rock:	
(Buzzard's Bay,) 196, 226; (New London Harbor Approaches,) 412; (Sakonnet River Approaches,) 249.	
Cormorant Rock-Ledge	412
Cornelius' Island	288
Corner Dook	459
Corner Stake Flats	591, 592
Corner Stake Light	591, 593, 594
Cornfield Point	349-350
Cornfield Point Light-vessel	349-350, 377-378, 390
Cornfield Point Shoal	390
Cornwall, Village of	600
Cornwall Landing	600
Cos Cob, Village of	491
Cos Cob Creek	491
Cos Cob Harbor	370, 490-495
Cotamy Bay	160
Cotamy Beach	160
Cotuit Flats	143
Cotuit Outer Harbor	144
Cotuit Port	84, 143
Cotuit River	84
Courses for Approaching New York Entrance from Seaward	577-582
Courses for Coasting Vessels Approaching New York Entrance	582-584
Cove, The:	
(Barnstable,) 69; (Black Rock Harbor,) 360, 461; (Oyster Bay Harbor,) 487; (Sakonnet River,) 246.	
Cove Creek or Oyster River	446
Cove Landing	487
Cove Neck	366, 487
Cove Rock:	
(Greenwich Cove,) 491, 494; (New Haven Harbor,) 446; (Tarpaulin Cove,) 155.	
Cove or Savin Rock Ledge	446
Covell's Folly	616
Cow and Calf, The, (off Branford Entrance)	380, 395, 444
Cow Harbor or Price's Bend	366, 477
Cow Island	608
Cow Island Dike	608
Cow Island Light	608, 620
Cow Neck	540
Cow or Manhasset Neck	368, 502, 506
Cow Neck Flats	540, 543
Cow Pasture Flats	45
Cow Point	410
Cow Rock Ledges	190
Cow Yard, The	63
Coven Rocks	36
Cows, The, (Black Rock Entrance)	360, 381, 453, 460, 461
Cows, The, (off Shippan Point)	370, 382, 474, 483
Coxsackie, Village of	606
Coxsackie Island	606
Coxsackie Island Shoal	616
Coxsackie Light-house	606, 620
Coxsackie Meadows	606
Cozzens' Hotel	599
Crab Creek	538
Crab Meadow Beach	365
Crab Meadow Creek	365
Crack Rock, (Greenwich Bay)	292
Crack Rock, (Westport Harbor)	240
Cram's Bank	521
Cranberry Island	259
Crane Neck	364, 464
Crane Neck Point	364, 464
Crane Reef	391, 430, 432
Crane's Bar	450
Craven's Shoal	563
Crawford's Point	305
Crummet Ledge	234
Crummet Neck	192, 233
Crooked Island Passage	581

C.	Page.
Crooked River	233
Crook's Spindle	340, 341, 343
Cross-Over Light	600, 620
Cross Rip	106, 112, 123
Cross Rip Light-vessel	105, 112, 123, 124
Croton, Village of	597
Croton Bay	597
Croton Flats	611
Croton Point	597
Croton River	597
Crow Head	535
Crow Island	206
Crow Point	51
Crow Point Flats	52
Crow Shoal	545-548
Crow's Nest, The	599
Cruger's Island	604
Cruger's Landing	597
Cruger's Wharf	604
Crum Elbow	601
Crum Elbow Creek	601
Crum Elbow Point	601
Culloden Point	309
Currents:	
Bass River Roads, 134; Boston Harbor, 53;—	
Centreville Harbor, 143; Connecticut River Entrance, 429;—	
East River, 533-534;—	
Fisher's Island Sound, 345;—	
George's Shoal, Appendix I;—	
Hudson River, 621; Huntington Bay, 482; Hyannis Roads, 139;—	
Long Island Sound, 516-517;—	
Main Ship Channel, (Boston Harbor,) 17; Monomoy Shoals, 170-173; Muskeget Channel, 124;—	
Nantucket Harbor, 159; Nantucket Shoals, 183-185; Nantucket and Vineyard Sounds, 170-173; New Bedford Harbor, 225; New Haven Entrance, 453; New Jersey Coast, 583; New London Entrance, 419; New York Bay and Harbor, 594;—	
South Coast of Long Island, 583;—	
Wellfleet Harbor, 76; Wood's Hole, 154.	
Currents between Cape Sable and Cape Cod	Appendix I
Cutchoque, Village of	540
Cutchoque Creek	540
Cutchoque Harbor	540
Cuttyhunk Harbor	187, 201-204
Cuttyhunk Island	89, 185, 187, 201
Cuttyhunk Light-house	89, 185, 239
Cuttyhunk Point	185
Cuyler's Bar	600, 615
Cuyler's Dike	609
Cuyler's Dike Light	609, 620
D.	
Dangerous Rock	546
Dangers:	
Acoakset River, 240, 241, 242; Along the Coast between Scituate Entrance and Cape Cod Bay, 60; Along the Coast between Strawberry Point and Scituate Harbor, 58; Anchorage under Black Point, 424; Anchorage off Four Mile River, 425; Apponagansett Bay, 219-221, 221-222, 223, 224;—	
Back or Western Way, (Boston Harbor,) 41-42; Barnstable Harbor, 69-70; Bass River Roads, 132, 133; Black Rock Channel, (Boston Harbor,) 39; Black Rock Harbor, 461-462; Block Island Channel, 403-405; Block Island Sound, 374-375, 403-405; Boston Harbor, 5-10, 13-15, 19-23, 25-29, 30-31, 31-33, 34-35, 36-38, 39, 41-42, 43; Branford Harbor, 442-443, 443-444, 444-445; Bridgeport Harbor, 457-459, 459-460; Bristol Harbor, 297-298, 299; Buttermilk Channel, 529; Buzzard's Bay, 192-198; Byram River, 497-498, 498-499;—	
Cataumet Harbor, 236-237; Catumb Passage, (Fisher's Island Sound,) 323; Centreville Harbor, 140-141, 141-142; Channel between No Man's Land and Martha's Vineyard, 125; Chatham Roads, 126-128, 128-129, 130-131; Cockenoc's Island Harbor, 468; Cohasset Harbor, 55, 56, 57; Connecticut River, 428; Cuttyhunk Harbor, 202-203, 204;—	

Dangers—Cont'd:

D.

Darien River, 473-474; Dartmouth Harbor, 219-221, 221-222, 223, 224; Delancey's Cove, 504; Duck Island Harbor, (Long Island Sound,) 432, 433-434; Dutch Island Harbor, 285-286, 286-287;—

East Channel, (New York Bay,) 570-571; East Coast of Cape Cod, 89-90; East River, 523-527; Eastern Passage of Narragansett Bay, 259-265; Edgartown Harbor, 161-162;—

False Hook Channel, (New York Bay,) 569-570; Fisher's Island Sound, 315-320, 322-323, 324-325, 325-326, 326-327, 328-329; Fourteen Feet Channel, (New York Bay,) 572-573;—

Gangway Passage, (Boston Harbor Approaches,) 36-38; Gardiner's Bay and Tributaries, 541-543, 545-547, 549; Gedney's Channel, (New York Bay,) 560-563, 565; Governor's Island Channel, (Boston Harbor,) 34-35; Great Peconic Bay, 543; Greenport Harbor, 542; Greenwich Bay, 292-293; Greenwich Cove, 491, 492-494; Guilford Harbor, 435-436, 437;—

Hempstead Harbor, 503, 504; Hingham Harbor, 52; Hog Island Harbor, 237-238; Holmes' Hole, 165, 167-168, 169-170; Hudson River, 610-616; Huntington Bay, 478-479, 481; Hutchinson's River, 515; Hyannis Roads, 136-136, 137-138; Hypocrite Channel, (Boston Harbor,) 19-23; Kellogg's Cove, 505; Kill Van Kull and Newark Bay, 592-593; Killingworth Harbor, 434;—

Little Neck Bay, 514; Little Peconic Bay, 543; Long Island Sound, 374-384, 389-396; Lord's Passage, (Fisher's Island Sound,) 324-325;—

Main Channel, (Fisher's Island Sound,) 315-320; Main Channel, (Long Island Sound,) 374-384; Main Channel, (New York Bay,) 560-563; Main Ship Channel, (Boston Harbor,) 5-10, 13-15; Main or South Channel, (Nantucket Sound,) 109-115; Mamaroneck River, 501; Manbasset Bay, 506-507, 508; Mattapoiset Harbor, 226-228; Middle Channel, (Nantucket Sound,) 105-108; Milford Harbor, 453-454; Mill Creek, 500; Mount Hope Bay, 301-302; Muskeget Channel, 119-120, 121-122, 122-123; Mystic River, 339-340, 341, 342-443, 344;—

Nantucket Sound, 90-97, 103, 105-108, 109-115; Narragansett Bay, 259-265, 272-276; Neponset River, 45-46; New Bedford Harbor, 206-210, 211-212, 214-217; New Haven Harbor, 447-450; New London Harbor, 411-414, 415-417; New Rochelle Harbor, 509-510, 510-511, 511-512; New York Bay and Harbor, 560-563, 565-566, 567-568, 569-570, 570-571, 572-573; Newark Bay, 592-593; Newport Harbor, 279-280, 281-282, 282-284; Niantic Bay, 420-422; North Channel, (Broad Sound—Boston Bay,) 30-31; North Channel, (Fisher's Island Sound,) 326-327; North Channel, (Long Island Sound,) 389-396; North Channel, (Nantucket Sound,) 89-101, 103;—

Osterville Harbor, 143-144; Oyster Bay, 487-488;—

Padanaram Harbor, 219-221, 221-222, 223, 224; Passage between Long Island Head and Nix's Mate, (Boston Harbor,) 43; Pelham Bay, 515; Pine Island Channel, (New London Harbor Approaches,) 415-417; Plymouth Harbor, 63-65, 66; Pocasset Harbor, 235; Port Jefferson Harbor, 464; Providence River, 263-265; Provincetown Harbor, 77;—

Quick's Hole, 156-157; Quisset Harbor, 238;—

Raritan Bay and River, 588-589; Red Brook Harbor, 235;—

Sachem's Head Harbor, 440; Sag Harbor, 545-546; Sakonnet River, 246-248, 249; Scituate Harbor, 58-59; Sculpin Ledge Channel, (Boston Harbor,) 43; Sheffield Island Harbor, 471-472; Shirley Gut, (Boston Harbor,) 31-33; Sippican Harbor, 230-232; South Channel, (Broad Sound—Boston Bay,) 25-29; South Channel, (Fisher's Island Sound,) 328-329; South Channel, (New York Bay,) 567-568; South or Main Channel, (Nantucket Sound,) 109-115; Southport Harbor, 465, 466; Stamford Harbor, 483, 484; Stonington Harbor, 331-332, 333-334, 334-335; Stratford Harbor, 455-456; Sugar Reef Passage, (Fisher's Island Sound,) 322-323; Swash Channel, (New York Bay,) 565-566;—

Tarpaulin Cove, 155; The Gangway, (Boston Harbor Approaches,) 36-38; Thimbles Channel, (Long Island Sound,) 394-396; Two Tree Island Channel, (Niantic Bay Approaches,) 420-422;—

Vineyard Haven, 166, 167-168, 169-170; Vineyard Sound, 97-101, 103, 105-108, 109-115;—

Page.

Dangers—Cont'd:

D.

Wareham River, 233-235; Warren River, 295; Watch Hill Passage, (Fisher's Island Sound,) 315; Wellfleet Harbor, 73-74; Westbrook Harbor, 430; Western Passage of Narragansett Bay, 272-276; Westport Harbor, (Long Island Sound,) 466-467; Westport Harbor, (Massachusetts,) 240-241, 242; Weymouth Fore River, 48-49, 49-50; Wickford Harbor, 288-289, 290; Wicopasset Passage, (Fisher's Island Sound,) 325-326; Wood's Hole, 145-146, 147-149, 150, 151-152.

Darien, Village of	370, 472
Darien River	370, 473-475
Darlington, Village of	364
Dartmouth, Village of	219
Dartmouth Harbor	219
Dartmouth Rock	221
Davenport's Island	373, 509
Davenport's Island North Reef	510
Davenport's Neck	372, 505, 509
David's Island	373, 509
Davis' Bank	176
Davis' Ledge	14
Davis' Neck	99
Davis' Neck Shoal	99
Davis' or New South Shoal	177
Davis' South Shoal Light-vessel	177, 185
Deacon's Seat, The	231
Dead-horse Inlet	533
Deadneck Point	84
Deadneck Rock	141, 142
Deadneck Shoal	141, 143
Decatur, Mount	419
Decatur Rock	208, 212
Deep Creek or Irish Channel	333
Deep Hole, The, (Osterville)	143
Deep Hole Rock	143
Deer Island	3, 19, 24-25
Deer Island Flats	32
Deer Island North Point	32
Deer Island Point	8, 19, 21, 27, 31
Deer Island Point Beacon	3, 8, 19, 21, 27, 31
De Kay's Hill	457
Delancey's Cove	372, 504-505
Delancey's Point	372, 500
Delancey's Point Ledge	501
Delano's Wharf	232
Denison's Rocks	338
Denning's Landing	598
Denning's Point	600
De Peyster's Bluff	604
Dering's Harbor	537-538
Dering's Point	537-538

Descriptions:

Acoakset River, 239-240; Anchorages between Black Point and Hatchett's Point, 424-426; Apponaugansett Bay, 219; Arthur Kill, 587-588;—

Back or Western Way, (Boston Harbor,) 49-41; Barstable Harbor, 68-69; Bass River Roads, 131-132; Black Rock Channel, (Boston Harbor,) 39; Black Rock Harbor, 460-461; Block Island Sound, 304-310; Boston Harbor, 1-5, 12-13, 18-19, 24-25, 30, 31, 33, 36, 39, 40-41, 42, 43, 44; Branford Harbor, 441-442; Bridgeport Harbor, 457; Bristol Harbor, 296-297; Buzzard's Bay, 185-192; Byram River, 497;—

Cape Cod, 61-62, 79-81; Cape Cod Bay, 61-63, 67-69, 72-73, 76-77; Cataumet Harbor, 188-189, 236; Centreville Harbor, 130-140; Channel between No Man's Land and Martha's Vineyard, 124; Chatham Roads, 126; Coast from Scituate to Cape Cod Bay, 50-60; Coast from Strawberry Point to Scituate, 57-58; Coast from Westport Harbor to Sakonnet River, 243; Cocke's Island Harbor, 467-468; Cohasset Harbor, 55; Connecticut River, 426-428; Cos Cob Harbor, 490-491; Cuttyhunk Harbor, 201;—

Darien River, 473; Delancey's Cove, 504; Duck Island Harbor, (Long Island Sound,) 431-432; Dutch Island Harbor, 284-285;—

East Coast of Cape Cod, 79-81; East River, 518-523; East Shores of Buzzard's Bay, 188-190; Eastern Passage of Narragansett Bay, 259-257; Edgartown Harbor, 160;—

Falmouth Harbor, 144; Fire Island Inlet, 551; Fisher's Island Sound, 310-314; Fort Hill Channel, (Boston Harbor,) 44;—

D.	Page.
Descriptions—Cont'd:	
Gangway Passage, (Boston Harbor Approaches), 36; Gardiner's Bay and Tributaries, 534-540; Governor's Island Channel, (Boston Harbor), 33; Great Captain's Island Harbor, 496; Great Peconic Bay, 540; Greenwich Bay, 291-292; Greenwich Cove, 490-491; Guilford Harbor, 435;—	
Hempstead Harbor, 502-503; Hingham Harbor, 51-52; Hog Island Harbor, 188, 237; Holmes' Hole, 164-165; Hudson River, 595-610; Huntington Bay, 475-478; Hyannis Roads, 134-135; Hypocrite Channel, (Boston Harbor), 18-19;—	
Killingworth Harbor, 434;—	
Little Captain's Island Harbor, 495; Little Narragansett Bay, 336-337; Little Neck Bay, 513-514; Little Peconic Bay, 540; Long Island Sound, 345-374;—	
Mamaroneck River, 500-501; Manhasset Bay, 506; Matacut Harbor, 159; Mattapoiset Harbor, 225-226; Milford Harbor, 453; Mill Creek, 499; Mount Hope Bay, 300-301; Muskeget Channel, 119; Mystic River, 338-339;—	
Nantucket Harbor, 158-159; Nantucket Shoals, 174-178; Nantucket Sound, 81-84; Narragansett Bay, 249-257, 268-272; Neponset River, 44-45; New Bedford Harbor, 205-206; New Haven Harbor, 445-447; New London Harbor, 408-411; New Rochelle Harbor, 508-509; New York Bay and Harbor, 554-560; Newark Bay, 591; Newport Harbor, 278-279; Niantic Bay, 419-420; North Channel, (Broad Sound—Boston Bay), 30; North Shores of Buzzard's Bay, 186-187; North Shores of Nantucket Sound, 83-84; North Shores of Vineyard Sound, 87-89; Northwest Shores of Buzzard's Bay, 190-192; Norwalk River, 469-471;—	
Osterville Harbor, 143; Oyster Bay, 486-487;—	
Padanaram Harbor, 219; Passage between Long Island Head and Nix's Mate, (Boston Harbor), 42; Peconic Bays, 540; Pelham Bay, 515; Plymouth Harbor, 62-63; Pocasset and Red Brook Harbors, 189, 235; Poponesset Bay, 144; Port Jefferson Harbor, 463-464; Providence River, 257-259; Provincetown Harbor, 76-77;—	
Quick's Hole, 156; Quincy Bay, 47; Quisset Harbor, 238;—	
Raritan Bay and River, 556-557, 588; Rockaway Inlet, 552-553;—	
Sachem's Head Harbor, 439; Sakonnet River, 243-246; Scituate Harbor, 53; Sculpin Ledge Channel, (Boston Harbor), 49; Sheffield Island Harbor, 469-471; Shelter Island Sound, 537-538; Shirley Gut, (Boston Harbor), 31; Sippican Harbor, 229-230; Smithtown Bay, 464; South Channel, (Broad Sound—Boston Bay), 24-25; South Coast of Long Island, 550-553; South Shores of Buzzard's Bay, 187; Southport Harbor, 405; Stage Harbor, 131; Stamford Harbor, 432; Stonington Harbor, 331; Stratford Harbor, 455;—	
Tarpaulin Cove, 154-155; The Gangway, (Boston Harbor Approaches), 36;—	
Vineyard Haven, 164-165; Vineyard Sound, 84-89;—	
Wareham River, 233; Warren River, 294; Wellfleet Harbor, 72-73; Westbrook Harbor, 429; Western Passage of Narragansett Bay, 268-272; Westport Harbor, (Long Island Sound,) 466; Westport Harbor, (Massachusetts,) 239-240; Weymouth Back River, 50-51; Weymouth Fore River, 47-48; Wickford Harbor, 287-288; Wild Harbor, 188, 237; Wood's Hole, 144-145.	
Despair Island.....	271
Devil's Back, The.....	26
Devil's Bridge, The.....	100, 125
Devil's Limb, The.....	26
Dewitt's Point.....	605
Dick's Flats.....	64
Dick's Rock, (Narragansett Bay).....	278
Dick's Rock (New Haven Harbor).....	448
Dimond Reef, (Hudson River).....	600, 612
Dimond Reef, (New York Harbor).....	527
Dinamore, Village of.....	602
Dinamore's Cove.....	602
Dinamore's Point.....	619
Divide, The, (Niantic River).....	420
Dix Island.....	558
Dix Ledge.....	210, 217
Dobbs' Ferry, Village of.....	596
Dodge's Island.....	311

D.	Page.
Dog Fish Bar.....	132
Dog Fish Ledge.....	241, 242
Dog Head Cove.....	601
Dog Head Cove Point.....	601
Dog Islands.....	470
Doodletown Bight.....	598
Dorchester Flats.....	5, 10, 23, 29
Dorchester Point.....	5
Donw's Point.....	609
Downing's Landing.....	503
Downing's Landing Shoal.....	503
Dry Ledge, (Buzzard's Bay).....	198, 234
Dry Ledge, (Wood's Hole).....	148, 152
Dry Romer, The.....	566
Duck Bar, (Rockaway).....	552
Duck Cove, (Hudson River).....	605
Duck Cove Flats, (Hudson River).....	614
Duck Island, (off Menunketesuck Point).....	350, 391, 432
Duck Island, (Northport Bay).....	365, 477
Duck Island Bluff.....	365, 477
Duck Island Harbor, (near Menunketesuck Point).....	350, 431-434
Duck Island Harbor, (Northport Bay).....	365, 477
Duck Island North Reef.....	432
Duck Island Shoal.....	479
Duck Island South Reef.....	433
Duck Point Channel.....	553
Duck Point Marshes.....	553
Duck Pond Point.....	353
Dumpling Rock Light-house.....	187, 205, 225, 239
Dumpling Rocks or The Dumplings, (Buzzard's Bay).....	187, 205, 207
Dumplings, The, (Narragansett Bay).....	254, 260, 280
Dunder Rock.....	463
Dunderberg Mountain or The Dunderberg.....	598
Dutch Island.....	251-252, 269, 285
Dutch Island Harbor.....	251, 269, 284-287
Dutch Island Light-house.....	251-252, 269, 285, 287, 303
Dutch Island Middle Ground.....	266
Duxbury, Village of.....	63
Duxbury Bay.....	63
Duxbury Beach.....	60, 63
Duxbury Pier.....	62
Duxbury Pier Light-house.....	62, 67
Dyer's Island.....	256
Dyer's Island Shoal.....	261
Dyer's Neck.....	463
E.	
Egan's, Village of.....	601
Easy's or Nest Rock.....	526
East Bank, (New York Bay).....	555, 562, 571, 572-573
East Bar.....	364
East Beach:	
(Hempstead Harbor,) 502; (Huntington Bay,) 476; (Mount Sinai Harbor,) 354; (Northport Bay,) 365, 479; (Port Jefferson Harbor,) 463.	
East Beach Flats.....	478
East Boston.....	5
East Bridgeport, Village of.....	457
East Cambridge.....	5
East Camp.....	605
East Channel, (New York Bay).....	570-572
East Chester, Village of.....	374, 515, 519
East Chop.....	85-86, 165
East Chop Flats.....	115, 166, 168
East Chop Light-house.....	86, 165, 170
East Clump.....	312, 318
East Coast of Cape Cod.....	79-81
East Dennis, Village of.....	72
East Flats, (Bridgeport Entrance).....	456
East Flats, (Stony Brook Harbor).....	364
East Fort.....	366, 476
East Greenwich, Village of.....	272, 292
East Hampton, Village of.....	550
East Harbor:	
(Fisher's Island Sound,) 312; (Long Island Sound,) 371; (Provincetown,) 77.	
East Haven, Village of.....	357, 447
East Hoghead Rock.....	53
East Island, (Rhode Island).....	243
East Island, (The Thimbles).....	356
East Knolls.....	561-562
East Landing.....	364

E.		E.	
	Page.		Page.
East Ledge:		Ely's Meadow	427
(Branford Harbor Approaches,) 443; (off Kelsey's Point,) 433;		End of Neck, (Wareham River)	233
(near The Thimbles,) 378-379, 393-394.		Enos' Ledge	57
East Lyme, Village of	419	Entrance Rock, (The Gangway)	37
East Neck, (Huntington Harbor)	366, 476	Entrance Rocks, (Wood's Hole)	148, 152
East Point:		Esopus, Village of	602
(Fire Island Inlet,) 551; (Fisher's Island,) 307, 310; (Quisset		Esopus Creek	605
Harbor,) 188, 218; (Three Mile Harbor,) 535.		Esopus Island	601-602
East Point Shoal, (Fisher's Island Sound)	328	Esopus Meadows	602, 612
East Point Shoal, (Long Island Sound)	488	Esopus Meadows Light-house	602, 620
East Providence, Town of	259	Esopus Middle Ground	602, 612
East River, (Guilford Harbor)	351, 435	Esopus Point	602
East River, (New York)	518-534	Essex, Village of	427
East Rock, (New Haven)	358, 446	Essex Harbor	427
East Rock, (off Sakonnet Point)	243	Essexport, Village of	605
East Rock or Little Lime Rock	280	Execution Rocks	368, 383, 507
East Rock Spindle	280	Execution Rocks Light-house	368, 507
East Shag Ledge or Rock	38, 57		
East Shores of Buzzard's Bay	188-190	F.	
East Spindle, (Fisher's Island Sound)	314, 316, 324	Factoryville, Village of	559
East Willies	37	Fairfield, Village of	360, 461
Eastern Branch, (Westport Harbor)	240	Fairfield Bar	360, 380-381, 458, 460, 461
Eastern Channel, (Bristol Harbor)	296, 297-298	Fairfield Beach	361
Eastern Channel, (Cohasset Harbor)	55, 57	Fairfield Creek	360, 461
Eastern or Fishkill Channel	563	Fairhaven, Village of, (New Bedford Harbor)	209
Eastern Chimney Sweep	511	Fairhaven, Village of, (New Haven Harbor)	417
Eastern Neck	48	Fairhaven Spire	206
Eastern Passage, (Narragansett Bay)	253-257, 259-268	Fairweather Island	360, 458, 460-461
Eastern Plain Point	308	Falkner's Island	351-352
Eastern Point	347, 408-409	Falkner's Island Light-house	351-352
Eastham, Village of	62, 72, 80	Falkner's Island Reef	303
Eastham or Weeset Harbor	80	Fall River	301
Easton's Beach	250	Fall River, City of	301
Easton's Cove	250	Falmouth, Village of	87
Easton's Point	250	Falmouth Harbor	87, 144
Eastville, Village of	86, 165	False Handkerchief, The	93
Eaton's Neck	365, 476	False Hook Channel, (New York Bay)	569-576
Eaton's Neck Light-house	365-366, 475, 482	False Hook Shoal	561, 567, 570
Eaton's Point	365, 475	False Spit	3, 7
Eaton's Point Shoal	381-382, 478	False Spit Beacon	3, 7
Eddyville, Village of	603	Fanning's Point	537
Edgartown, Village of	160	Fanning's Point Shoal	538, 542
Edgartown Harbor	85, 160-164	Farm Meadows	44-45, 47
Edgartown Light-house	85, 160, 164	Farm Point	44-45
Edgewater House	604	Farm Point Shoal	45
Edwards' Rock	202	Farm River	337
Edwards' Shoal	106, 113, 123	Farms Point	361, 455
Eel Grass Ground	317-318, 327, 334	Fatal Rock	220
Eel Grass Light-vessel	317-318	Ferry, The, (Fall River)	301
Eel Pond	174	Ferry Point, (Arthur Kill)	567
Eel's Hill	337	Ferry Point, (Shelter Island Sound)	538
Egg Island Flats, (New Bedford)	209, 216	Ferry Point Flats	538, 569
Egg Island Rock, (Wellfleet)	74	Ferry Wharf, (Conanicut Island)	255
Egg Islands, (New Bedford)	203	Field Point	258
Egg Rock, (Massachusetts Bay)	60, 63	Fifty Fathom Hole	374-375
Egg Rock, (New Bedford)	203, 209, 216	Finche's Island	370
Egg Rock Beacon	203, 209, 216	Finche's Island Rocks	493-494
Egg Rock Light-house	53	Fire Island Beach	551
Egg or Shag Rocks, (Boston Bay)	2	Fire Island Inlet	551-552
Eight Feet Rip	175	Fire Island Light-house	551
Eight Feet Shoal	176-177	Fire Islands	551
Eight Feet Rock, (Sippican)	231	Fireplace, The, Village of	535
Eighteen Feet Rip	175	First Thirty-seven Fathom Hole	575-576
Eighteen Feet Rip, Outer	175	Fish House Shoals	616
Elbow Beacon, (Newark Bay)	591, 593, 594	Fish Island	471
Eldridge's New Eastern Shoal	184	Fish Island	471
Eldridge's Shoal	97	Fish Island Reef	389
Eleven Feet Bank	209, 216-217	Fish Islands	307, 312
Ellis' Point	370, 490	Fisher's Island	310-345
Ellis's Island	337	Fisher's Island Sound	288
Elizabeth, Town of	587	Fishing Cove	177
Elizabeth Islands	88-89, 187	Fishing Rip	600
Elizabethport, Town of	587	Fishkill, Village of	600
Elizabethport Flats	592	Fishkill or Eastern Channel, (Jamaica Bay)	553
Ellerslie Wharf	612	Fishkill Creek	600
Ellis' Island	559	Fishkill Flats	612
Ellis' or Vincent's Island	370	Fishkill Hassocks, (Rockaway)	553
Ellis' Reef	335, 341	Fishkill Landing	600
Elm Point	569, 514	Five Fathom Bank	574
Elm Tree Beacon	557, 584	Five Fathom Bank Light-vessel	574
Elm Tree Point	607	Five Feet Rock, (Branford Entrance)	379, 395, 443, 444
Ely's Ferry	427	Five Hook Island	607
Ely's Hill	427	Five Hook Island Light	607, 620

INDEX.

IX

F.

Page.

Five Mile Point, (New Haven Entrance).....	357-358, 445
Five Mile River.....	369
Flagg Island.....	557, 441
Flat Hammock.....	313, 319-320
Flat Neck Point.....	490, 495
Flat Neck Point Shoal.....	491, 495
Flat Point, (Hudson River).....	607
Flat Rock:	
(Greenwich Bay,) 292; (Niantic Bay,) 421; (Westport Harbor,) 241; (Wickford Harbor,) 289, 290.	
Flatbush, Township of.....	603
Flats, The, (Hudson River).....	603, 613
Flax Pond.....	364
Flint Point.....	244
Flood Rock.....	522, 526
Flushing, Village of.....	520
Flushing Bay.....	519
Flushing Creek.....	519
Flying Fish Rock.....	70
Flying Place, The, (Boston Harbor).....	1
Flying Point, (Long Island Sound).....	356
Flynn's Knoll.....	561
Fog Signals:	
Bartlett's Reef Light-vessel, 348, 376, 420; Beaver Tail Light-house, 251, 269; Bergen Point Light-house, 591; Bishop and Clerk's Light-house, 84, 94, 135; Block Island Southeast Light-house, 305; Boston Light-house, 2; Brenton's Reef Light-vessel, 253, 259; Bridgeport Harbor Light-house, 360, 457;—	
Conimicut Light-house, 257; Cornfield Point Light-vessel, 350, 378; Cross Rip Light-vessel, 105, 112, 123;—	
Davis' South Shoal Light-vessel, 177; Dumping Rock Light-house, 187, 265; Dutch Island Light-house, 252, 269, 285;—	
Eaton's Neck Light-house, 365, 475; Eel Grass Light-vessel, 318; Execution Rocks Light-house, 368, 507;—	
Falkner's Island Light-house, 352; Five Fathom Bank Light-vessel, 574; Fort Lafayette, 568;—	
Goat Island Light-house, 278; Governor's Island, (New York Harbor,) 523, 560;—	
Handkerchief Light-vessel, 93; Hen and Chickens Light-vessel, 186; Highland Light-house, (Cape Cod,) 79;—	
Little Gull Island Light-house, 308, 346; Long Beach Point Light-house, 536; Long Point Light-house, 77;—	
Middle Ground Light-house, 355, 380; Minot's Ledge Light-house, 12; Montauk Point Light-house, 300, 550; Muske Bed Shoals Light-house, 300;—	
New Haven Entrance, 358, 446; New London Light-house, 348, 408; New York Entrance, 554-555; Newport Harbor Light-house, 278; Nobska Point Light-house, 87, 145; North Hammock Light-house, 314;—	
Penfield's Reef Light-house, 361, 381, 458; Plum Island Light-house, 347; Point Judith Light-house, 288, 306; Pollock Rip Light-vessel, 91;—	
Race Point Light-house, (Cape Cod,) 61, 76; Race Rock Light-house, (Long Island Sound,) 307, 348; Robbins' Reef Light-house, 559;—	
Sandy Hook, 555; Sandy Hook Light-vessel, 554; Saybrook Light-house, 349, 426; Scotland Light-vessel, 555; Shovelful Shoal Light-vessel, 93; Southwest Ledge Light-house, 358, 446; Stepping Stones Light-house, 369, 614; Stonington, 331; Stony Point Light-house, 538; Stratford Point Light-house, 359, 455; Stratford Shoal Light-house, 355, 380; Succonesset Shoal Light-vessel, 98;—	
Throg's Neck Light-house, 369, 515, 518;—	
Vineyard Sound Light-vessel, 100, 185-186.	
Fogland Point.....	244
Forbes' Bluff.....	446
Forbes' Hill.....	47
Forbes' Rock.....	383, 498
Forbarn Point.....	606
Fort Adams.....	254, 278
Fort Columbus.....	523, 560
Fort Dumping.....	252, 253
Fort Flat.....	200-210, 217

A. C. P.—2*

F.

Page.

Fort Griswold.....	347, 409
Fort Griswold, Old.....	409
Fort Hale.....	446
Fort Hamilton.....	558
Fort Hamilton, Village of.....	558
Fort Hill, (Fisher's Island Sound).....	314
Fort Hill Channel.....	5, 44
Fort Independence.....	4
Fort Lafayette.....	558
Fort Lee.....	596
Fort Molly.....	470
Fort Montgomery.....	598
Fort Point, (New Bedford Harbor).....	206
Fort Point, (New London Harbor).....	409
Fort Point Beacon.....	206
Fort Pond Bay.....	309, 386, 399, 406, 407
Fort Rock.....	262, 275
Fort Schuyler.....	369, 515, 518
Fort Stevens.....	522
Fort Tompkins.....	558
Fort Tompkins Light-house.....	558, 594
Fort Trumbull.....	400
Fort Warren.....	3, 13, 25
Fort Washington.....	596
Fort Winthrop.....	5, 25
Fort Wolcott.....	254, 278
Fort Wood.....	559
Fort Wooster.....	447
Four Feet Shoal, (Boston Harbor).....	34
Four Feet Shoal, (Nantucket Shoals).....	175
Four Feet Rock.....	493, 496, 498
Four Ledges.....	234
Four Mile Point.....	606
Four Mile Point Flats.....	615
Four Mile Point Light-house.....	606, 620
Four Mile River.....	349, 424
Fourteen Feet Channel, (New York Bay).....	572-573
Fourteen Feet Rip, (Nantucket Shoals).....	175
Fourteen Feet Shoal, (Muskeget Channel).....	113, 123
Fourteen Feet Shoal, (Nantucket Shoals).....	175
Fourth Cliff.....	60
Fourth Cliff Bay.....	60
Fowler's Rock.....	273
Fox Island, (Long Island Sound).....	267
Fox Island, (Wickford Harbor).....	270, 288
Fox Island Shoal.....	274, 288
Fox Point.....	601
Fox Rocks.....	234
Franklinville, Village of.....	540
Frank's Ledge.....	413, 417
Freebody's Hill.....	255
French Watering Place.....	88
Fresh Kills, The.....	583
Fresh Pond Landing.....	354
Friar's Head.....	354
Friar's Head Landing.....	354
Frost's Point.....	361, 466
Frying Pan, The.....	525
Fuller's Rock Light-house.....	259, 303

G.

Gale's Ferry.....	410
Gallatin Rock, (Mattapoiset Harbor).....	227
Gallatin Rock, (Nantucket Sound).....	95, 137, 140, 141
Gallows Hill.....	531
Gallup's Island.....	3, 13, 25, 41
Ganmon, Point.....	83, 134
Gangway Passage or The Gangway.....	86-39
Gangway Rock:	
(Fisher's Island Sound,) 315; (Long Island Sound,) 363-384, 507; (Nantucket Sound,) 95, 136, 137.	
Garden Flats.....	298
Gardiner's Bay.....	534-550
Gardiner's Island.....	308, 535
Gardiner's Island Light-house.....	308, 535, 550
Gardiner's Neck.....	301
Gardiner's Point.....	308, 535
Gardiner's or Winkle Point.....	477
Gardiner's Rock.....	136, 138
Garretson's Point.....	503
Garrison's Landing.....	599
Gaspee Point.....	257-258

G.	Page.	G.	Page.
Gaspee Point Shoal	284	Grassy Island, (Stamford Harbor)	482
Gates' Island	311	Grassy Island, (Wood's Hole)	146
Gay Head	86-87, 124	Grassy Island Ledge	146
Gay Head Light-house	86-87, 124	Grassy Point	537
Gazelle Rock	95, 136	Gravelly Island	227
Gedney's Channel, (New York Bay)	560-565	Graves, The	5-6, 19-20, 25
General Courses for approaching New York Entrance from Seaward	577-582	Graves Neck	337
General Courses for Coasting Vessels approaching New York Harbor	582-584	Graves Point	254
General Directions for:		Gravesend, Village of	568
Beating up Boston Bay, 18;—		Gravesend Bay	568
Fire Island Inlet, 552;—		Gravesend Point	555
Rockaway Inlet, 553-554.		Great Beach Hill	72
General Remarks on:		Great Beach Point	72
Approaches to Boston Harbor, 44; Approaches to New York Bay and Harbor from Sea, 573-577;—		Great Bed Shoal	284
Barnstable Harbor, 71;—		Great Brewster, (Boston Entrance)	2, 13, 19, 25
Beating into Plymouth Harbor, 67;—		Great Captain's Island	371, 492, 496
Centreville Harbor and Vicinity, 142-143; Courses and Currents in Hell Gate, 531-533;—		Great Captain's Island East Reef	496
Hyannis Roads, 139;—		Great Captain's Island Harbor	496-497
Little Narragansett Bay, 338;—		Great Captain's Island Light-house	370-371, 466
Steamship Courses between Europe and New York, 584-587;—		Great Captain's Island West Reef	493, 496, 498
Thames River, 418-419; Tidal Currents in the Main Ship Channel, (Boston Harbor,) 17-18.		Great Creek	69
George's Island	3	Great Cove	552
George's Island Rocks	7-8	Great Eastern Rock	464
George's Rock	381, 466	Great Faun Bar	25, 30
George's Shoal, Currents on	Appendix I	Great Faun Bar Beacon	25, 30
Germantown, Village of, (Boston Harbor)	48	Great Flats, (Wareham)	234
Germantown, Village of, (Hudson River)	606	Great Gull Island	308, 316
Germantown Dock	605	Great Harbor, (Wood's Hole)	87, 145
Gibbs' Point	522	Great Hill	192
Gifford's Ledge	197, 238	Great Hog Neck	539
Gilgo Inlet	552	Great Hog Neck Shoal	540, 542-543
Glades Flats	35	Great Island, (Long Island Sound)	370
Glasco, Village of	604	Great Island, (Wellfleet)	73
Glasco Channel	604, 614	Great Kills, The	557
Glen, The	245	Great Kills Flats	589
Glen Cove, Village of	502	Great Ledge:	
Glen Cove Landing	502	(Narragansett Bay,) 270, 273, 286, 288; (off New Bedford,) 194-195, 207, 211, 222; (Wood's Hole,) 145, 147, 150, 151.	
Glover's Reef	492, 499	Great Marshes, The	69
Goat Island, (Narragansett Bay)	250, 254-255, 278	Great Mill Rock	522
Goat Island Light-house	255, 278, 284, 303	Great Neck, (Huntington Bay)	366, 476
Goat Island Shoal	280	Great Neck, (Manhasset Bay)	360, 506, 514
Goffe's Island	310	Great Neck Flats	479
Goldsmith's Inlet	353	Great Neck Point	477
Good Wives River	370, 473	Great Negro Head	526
Goose Island:		Great Peconic Bay	540
(Connecticut River,) 427; (off Falkner's Island,) 351; (Greenwich Cove,) 491; (Hudson River,) 604; (New London Harbor,) 409; (Norwalk Islands,) 362, 467.		Great Point, (Nantucket)	82
Goose Island Ledges	393	Great Point Rip	82, 111
Goose Rock or The North Brother	424	Great Reef	381
Goose Rock Shoals	440	Great Reef Spindle	381, 472
Goose Rocks, (Long Island Sound)	393, 437, 439	Great Rip, (Nantucket Shoals)	175-176
Gooseberry Island, (Narragansett Bay)	271	Great Rock, (Hyannis Roads)	136, 138
Gooseberry Island, (South Shore of Rhode Island)	250	Great Rock, (Westbrook Harbor)	430
Gooseberry Neck	185, 239	Great Round Shoal	91-92, 110
Gorman's Pond	473	Great South Bay	552
Goshen Point	348	Great Thatcher Island	69
Goshen Reef	348, 412, 421	Green Flat Island	374, 512
Goshen Reef, Little	421	Green Harbor Point	60
Gould Island, (Narragansett Bay)	255	Green Harbor River	60
Gould Island, (Sakonnet River)	245	Green Hill	13
Gould's Wharf	605	Green Island, (Boston Harbor)	19, 25
Governor's Island:		Green Island, (Hudson River)	610
(Boston Harbor,) 5, 25; (Long Island Sound,) 356; (New York Harbor,) 523, 560.		Green Island, Village of	20
Governor's Island Channel	33-36	Green Island Ledges	614
Governor's Island Flats	9, 22, 28, 32, 34	Green or Livingston's Flats	605
Governor's Island Point	9, 22, 28, 33	Green Point, (Hudson River)	609
Governor's Island Shoal	9, 23, 28, 35	Greenbush, Town of	257
Governor's Island South Shoal, (New York Harbor)	529	Greene's Island	263
Governor's Island West Shoal, (New York Harbor)	529, 563	Greene's Island Flats	426
Gowanus Bay	523, 559	Greenfield, Town of	531
Gowanus Flats	559, 563, 592	Greenport, Town of	542
Grampuses, The	38, 56	Greenport Flats	537
Grant's Neck	349	Greenport Harbor	598
Grape Island	47, 51	Green's Cove	409
		Green's Harbor	281, 471
		Green's Ledge	552
		Green's Point	559
		Greenville, Village of	370, 490
		Greenwich, Village of	272, 291-294
		Greenwich Bay	370, 490-495
		Greenwich Cove, (Long Island Sound)	370, 490-495
		Greenwich Cove, (Narragansett Bay)	285

INDEX.

XI

G.	Page.
Greenwich, East, Town of.....	292
Greenwich Island.....	490
Greenwich Neck.....	490, 495
Greenwich Point.....	370
Greenwich Point Shoal.....	484
Greer's Point.....	601
Gridiron, The.....	526
Griffin Island.....	73
Griswold, Fort.....	347
Griswold's Cove.....	349, 427
Griswold's Island.....	348, 424
Griswold's or New Breach Point.....	349, 426
Groton, Village of.....	347, 409
Groton Long Point.....	314
Groton Long Point Reef.....	319, 343, 344
Groton Monument.....	347, 409
Grove Point.....	606
Grover's Cliff.....	19, 25
Grover's Hill.....	360, 461
Guard-House Point.....	349
Guilford, Town of.....	351, 435
Guilford Harbor.....	351, 435-439
Guilford Shoals.....	392, 435
Gull Island, (Cohasset Harbor).....	37, 56, 57
Gull Island, (Cuttyhunk Harbor).....	187, 201
Gull Island Ledge, (Cuttyhunk Harbor).....	202
Gull Island Ledges.....	57
Gull Island Point.....	204
Gull Islands, (Long Island Sound).....	346
Gull Point, (Prudence Island).....	252, 256
Gull Point, (Weymouth Fore River).....	48
Gull Point Flats.....	49
Gull Rock, (Sippican).....	231
Gull Rocks, (Narragansett Bay).....	283
Gull Rocks, (South Coast of Rhode Island).....	250
Gull Rocks Shoal.....	283
Gunning Point.....	188
Gurnet Point.....	62
Gurnet Point Light-houses.....	62, 67
Gurnet Rock.....	63
Gurnet Rock or Gurnet Ledge, (Centreville).....	141, 142
Gut, The.....	457
Gut Island.....	505
Guttenberg, Village of.....	596

H.	Page.
Hackensack River.....	591
Haddam, Town of.....	426
Hadley's Harbor.....	88, 145
Hadley's Rock.....	148, 150, 152
Half-acre Island.....	392, 435
Half Mile Rocks.....	241, 242
Half Mile Shoal.....	241
Half Moon Island.....	47
Half-Tide Rock, (Hyannis Roads).....	136, 138
Half-Tide Rock, (Neponset River).....	45
Half-Tide Rocks, (Boston Entrance).....	20-21
Half-Way Hollow Landing.....	354
Half-Way Rock: (Narragansett Bay,) 255, 261; (Westport Harbor Approaches) 242; (Wickford Harbor,) 289.	606, 615
Hallenbeck's Creek.....	522
Hallet's Cove, (East River).....	522
Hallet's Middle Ground.....	522
Hallet's Point, (East River).....	521, 525
Hallet's Point Reef, (East River).....	95, 133, 135
Hallet's Rock.....	354
Hallock's Landing.....	538
Hallock's Point.....	542
Hallock's Point Shoal.....	188
Hamlin Point.....	196-197
Hamlin Point Rocks.....	521
Hammock, The.....	434
Hammock Point.....	351, 434
Hammonasset Point.....	378, 391
Hammonasset Point Reef.....	351, 434
Hammonasset River.....	600
Hampton, Village of.....	83, 126-127, 128, 132
Handkerchief, The.....	93
Handkerchief, Broken Part of.....	93
Handkerchief, False, The.....	93
Handkerchief Light-vessel.....	93

H.	Page.
Handkerchief Shoal or The Handkerchief.....	93, 126-127, 128, 132
Hangman's Island.....	41, 47
Hansford Point.....	361
Harbor Beach.....	367, 503
Harbor Flats, (Vineyard Haven).....	186
Harbor Ledge.....	483
Harbor Regulations of New York Harbor.....	Appendix II
Harbor Rock.....	59
Harding's Beach.....	83, 126, 131
Harding's Beach Light-house.....	83, 126, 131
Harding's Beach Point.....	83, 126, 131
Harding's Ledge or The Hardings.....	6-7, 14
Harding's Ledge Beacon.....	6-7, 14
Harlem River.....	522
Harlow Rocks.....	235
Harrow Teeth, The.....	468
Hart Island.....	373, 512
Hart Island North Reef.....	510, 512
Hart and City Island Harbor.....	511-513
Hartford, City of.....	426
Harwich Flats.....	128, 130
Hashamomuck Beach.....	533
Hashamomuck Point.....	538
Hashamomuck Pond.....	538
Hastings, Village of.....	596
Hatchett's Point.....	349
Hatchett's Reef.....	377, 389-390, 425
Hatch Creek.....	72
Hatsett's Rock.....	161-162
Hatter's Dock.....	532
Haverstraw, Village of.....	597
Haverstraw Bay.....	597
Hawes' Shoal.....	107, 113, 120
Hawk's Nest Point.....	312
Hawk's Nest Point Reef.....	328
Hay Beach Point.....	536
Hay Beach Point Flats.....	541-542
Hay Island.....	363, 467, 471
Haycock Point.....	356
Haycock Rocks.....	468
Hayward's Creek.....	48
Head and Horns.....	551
Head of the Harbor, (Stonington).....	331
Hedge Fence, The.....	108, 114-115
Hedges' Banks.....	535
Heel-tap Rock.....	525
Hell Gate, (East River).....	521-522, 531-533
Hemlock Point.....	602
Hempstead Harbor.....	367, 502-504
Hempstead or Roslyn, Village of.....	367, 502
Hen Island, (Mamaroneck River).....	372, 499, 500
Hen Island, (Sakonnet River).....	246
Hen and Chicken, The, (East River).....	522, 526
Hen and Chickens, The: (Buzzard's Bay,) 185, 193, 240; (Hudson River,) 602, 612; (Long Island Sound,) 350.	186, 193
Hen and Chickens Light-vessel.....	215
Henrietta Rock.....	354
Herod's Point.....	379
Herod's Point Shoal.....	379
Herring River: (Cape Cod Bay,) 72; (Nantucket Sound,) 83; (Wellfleet,) 73.	368-369
Hewlett's Cove.....	373, 509
Hewlett's Island.....	368-369, 506
Hewlett's Point.....	508
Hewlett's Point Reef.....	70
Hickens' Rock.....	240
Hicks' Rock.....	86
Higgon, Cape.....	522
High Bridge, (Harlem River).....	244
High Hill Point.....	374, 512
High Island, (near City Island).....	356
High Island, (Kidd's Islands).....	60, 63
High Pine Ledge.....	421
High Rock.....	597
High Tor.....	448
High Water Rock.....	61, 78, 79-80
Highland or Cape Cod Light-house.....	554
Highland or Navesink Light-houses.....	598
Highlands, The, (Hudson River).....	601
Highlands, The, Village of.....	554
Highlands of Navesink.....	554

H.	Page.
Hill's Point, (Long Island Sound)	361
Hill's Point, (Shelter Island Sound)	538
Hingham, Village of	51
Hingham Bay	13
Hingham Harbor	51-53
Hoadley's Point	356
Hoboken, Town of	596
Hob's Island	409
Hodges Rock	95, 137, 140
Hoffmann Island	558
Hog Creek	535
Hog Creek Point	535
Hog Island: (Buzzard's Bay,) 190; (Long Island Sound,) 367; (Narragansett Bay,) 256, 296.	
Hog Island Harbor, (Buzzard's Bay)	188, 237-238
Hog Island Inlet	552
Hog Island Ledge	238
Hog Island Point	188
Hog Island Point Shoal	238
Hog Island Rock	298
Hog Island Shoal	262, 297, 299, 301-302
Hog Neck, (Buzzard's Bay)	190
Hog Neck, (Shelter Island Sound)	539
Hog Neck Flats	547
Hog Neck Shoal	547
Hog's Back, The: (East River,) 525; (Hudson River,) 604, 613; (New London Harbor,) 414.	
Hogshead Point, (Long Island Sound)	351
Hogshead Rock	38, 56
Hole in the Wall	581
Holly's Pond	370
Holmes' Hole, Village of	165
Holmes' Hole or Vineyard Haven	86, 164-170
Holmes' Hole or West Chop Light-house	86, 165, 170
Holmes' Point	63
Holmes' Rock	525
Hook Beacon, (Sandy Hook)	555, 594
Hook Flats, (Hudson River)	611
Hook Mountain	597
Hook of Cape Cod	61
Hope Island	271
Horn's Hook	522
Horse Island, (The Thimbles)	356
Horse Island, (Wellfleet Harbor)	72
Horse Neck, (Greenwich Bay)	292
Horse Neck, (Long Island Sound)	371
Horse Neck Beach	239
Horse Neck Point	370
Horse-Shoe Cove	590
Horse-Shoe Reef, (Fisher's Island Sound)	314, 320, 344, 415-416
Horse-Shoe Shoal, (Barnstable)	70
Horse-Shoe Shoal, (Nantucket Sound)	95-97, 107, 112
Horse-Shoe Shoal, Broken Ground of	96, 105, 107, 112
Horton, Mount	410
Horton's Beach	353
Horton's Cove	410
Horton's Neck	353
Horton's Point, (Long Island Sound)	353
Horton's Point, (Thames River)	410
Horton's Point Light-house	353
Hospital Shoal	41, 43
Hough's Neck	47
Houghtalling Island	607
Houghtalling Island Shoal	615
Housatonic River	359, 455
Howell's Point	552
Howland's Ledge	60-63
Hoyt's Landing	602
Hudson City, (Hudson River)	606
Hudson City, (New Jersey)	596
Hudson City Light-house	606, 615, 620
Hudson Middle Ground	606, 615
Hudson River	595-621
Hudson's Head, (Vineyard Haven)	165
Huggins' Island	69
Hughsonville, Village of	600
Hull, Village of	2, 13, 41
Hull's Ledge	270
Hull's Rocks	484
Hulse's Landing	354

H.	Page.
Hummock Point	246
Hunchoer's Rock	460, 461
Hunchoer's Rock Beacon	458, 460, 461
Hunter's Island	373
Hunter's Point, (East River)	523
Huntington, Village of	476
Huntington Bay	366, 475-482
Huntington Harbor	476
Hunt's Ledge, (Boston Harbor)	7, 15, 42
Hunt's Ledge, (Greenwich Bay)	292
Hunt's Point	519
Hursell Rock	165, 214
Hussey Rock	226, 232
Hutchinson's River	374, 515-516
Huyler's Landing	596
Hyannis, Village of	83, 134
Hyannis Light-house	83, 134-135, 139
Hyannis Middle Ground	65, 138
Hyannis Point	83-84, 134
Hyannis Port, Village of	83, 134
Hyannis Roads	83, 131-139
Hyde Park	691
Hypocrite Channel, (Boston Harbor)	18-21

I.	
Ice:	
Boston Bay and Harbor, 54; Bridgeport Harbor, 518; Buzzard's Bay, 239;—	
Cape Cod Bay, 79;—	
Edgartown Harbor, 174;—	
Fisher's Island Sound, 345;—	
Holmes' Hole, 174; Hyannis Roads, 174;—	
Long Island Sound, 517-518;—	
Nantucket Harbor, 174; Nantucket Shoals, 185; Nantucket and Vineyard Sounds, 173-174; Narragansett Bay, 304; New Bedford Harbor, 239; New Haven Harbor, 518; New London Harbor, 517-518;—	
Plymouth Harbor, 67; Provincetown Harbor, 79;—	
Vineyard Haven, 174;—	
Wood's Hole, 174.	
Ice-House Wharf	563
Ida, Mount	610
In-bach Flats	514
In-bach Marshes	605
Indian Clump	422
Indian Harbor	379
Indian Hill: (Martha's Vineyard,) 86; (New London Harbor,) 411; (West Shore of Cape Cod Bay,) 66, 68.	
Indian Neck	357, 441
Indian or Jeffry's Point	357, 441
Indian Reef	392, 437
Indian River, (Killingworth Harbor)	351, 434
Indian River, (Milford Harbor)	358, 433
Indian Rock	602
Inez Rock	208, 212, 214
Inlet Point	353
Inner Coat Rock	432
Inner Harbor: (Boston Harbor,) 5; (Edgartown Harbor,) 160; (New Bedford Harbor,) 205; (Pocasset Harbor,) 235; (Plymouth Harbor,) 63; (Wellfleet Harbor,) 73; (Wickford Harbor,) 271, 288.	
Inner Minot, The	14
Inner or Northeast Beacon	458
Inner Reef	394
Inner Seal Rock	53
Inner Thirty-two Fathom Hole	576
Inshore Channel to Connecticut River	453
Iona Island	568
Irish or Deep Creek Channel	553
Iron Works, The, (Troy)	610
Irrington, Village of	606
Island Channel	553
Island Rocks	246
Islip, Village of	532

J.	
Jack-Knife Ledge	49
Jacob's Hills	265
Jacob's Neck	180

INDEX.

XIII

J.

	Page.
Jacob's Point, (Long Island)	353
Jacob's Point, (Warren River).....	294
Jacob's Point Shoal, (Warren River).....	295
Jacques Rock	37, 56, 57
Jamaica Bay	553
James' Ledge	270, 274, 288-289, 290
Jamesport, Village of	540
Jamesport Flats	543
Jamestown, Village of	255
Jeffrey's Hook	596
Jeffry's or Indian Point	357, 441
Jennings' Point, (near Southport Harbor).....	361, 465
Jericho Landing	354
Jersey City	560, 596
Jersey Flats	559, 563, 592
Jessup's Neck	539
Jessup's Neck Shoal	542
Job's Neck	88
Jool's Cove	365
Jool's Point Hassock	553
John's Point Marsh	553
John's Rock	425
Johnson's Creek	233
Johnson's Ledge	271, 274-275
Johnson's Point	357
Jones' Island	602
Jones' Ledges	273, 285
Jones' River	63
Jones' Rocks	493, 496
Joshua's Point	356, 439

K.

Keel Rock	221
Kellogg's Cove	372, 505-506
Kellogg's Shoal, (near Troy)	616
Kelly's Point	602
Kelly's Rock	8
Kelsey's Point	350, 431
Kelsey's Point Shoals	391, 433
Kellum's Point	476
Kellum's Point Reef	478
Kensie's Point	361, 465
Kettle-Bottom Rock	260, 280
Kettle Point	259
Keyport, Village of	557
Kickanuit River	301
Kidd's Humbug	598
Kidd's Islands	356
Kidd's Money Hole	365
Kill Pond Bar	83, 130, 132
Kill Van Kull	558-559, 591
Killingworth Harbor	351, 434-435
Kimberley's Reef	378, 392-393
Kinderhook, Village of	607
Kinderhook Creek	606
Kinderhook Flats	615
Kingsland's Point	597
Kingston, Village of	63
Kingston Bay	63
Kingston Point	603
Kingstown, Village of	535
Knickerbocker Pier	603
Knickerbocker Wharf	602
Knubble, The, (Westport Harbor)	240

L.

Lackey's Bay	88
Lagoon Pond	165
Laing's Cove	519
Lamp Island	607
Landing at Barrytown	604
Landing Hook	228
Laudman's Creek	602
Lantern Hill	405
Latham's Chair	409
Latimer's Reef	316-317
Laurel Hill, Village of	411
Lawrence's Point	521
Lawrence's Point Ledge	521, 524
Lazy Rock	220
Lee's River	301

L.

	Page.
Leggett's Point	519
L'Homme Dieu Shoal	98, 108
Lent's Cove	598
Lewis Bay	83
Lewis' Landing	431
Lieutenant's River	427
Life-Saving Stations:	
Block Island, 306; Boston Bay, 54;—	
Cape Cod, 78, 81;—	
Nantucket to New York, 595;—	
Plymouth, 67; Point Judith, 306;—	
Watch Hill Point, 307.	
Light-house Establishment, (Tompkinsville)	558
Light-house Head	347
Light-house Island, (Boston Harbor)	2
Light-house Point, (New London)	347, 408
Light-house Point Flats, (Tarpaulin Cove)	162
Lime Kilns, The	598
Lime Rock	279
Lime Rock Light-house	279, 284, 303
Limestone Point	600
Line Island	552
Little Bay, (Little Neck Bay)	514
Little Bay, (Orient Harbor)	537
Little Bare Island	356
Little Beach	73
Little Bird Island	198, 234
Little Browster Island	2
Little Calf Island	18, 25
Little Captain's Island	371, 491, 495
Little Captain's Island East Reef	491, 495
Little Captain's Island Harbor	495
Little Captain's Island West Reef	495
Little Faun Bar	21, 26-27, 30-31
Little Goshen Reef	421
Little Gull Island	307-308, 346
Little Gull Island Light-house	307-308, 346
Little Gull Island Reef	376
Little Harbor, (Wood's Hole)	87, 145
Little Hell Gate	521
Little Hog Neck	540
Little Hog Neck Shoal	543
Little Island, (Sippican)	231
Little Island, (Warren River)	294
Little Island Point	188
Little Island Shoal, (Warren River)	295
Little Lime Rock or East Rock	280
Little Mill Rock	522
Little Narragansett Bay	310, 336-338
Little Neck:	
(Huntington Bay,) 447; (Little Neck Bay,) 369, 514; (Vineyard Haven,) 165.	
Little Neck Bay	368, 513-515
Little Neck Point	477
Little Neck Point Shoal	479
Little Negro Head	522, 526
Little Peconic Bay	540
Little Ram Island	312
Little Rock, (Niantic Bay)	421
Little Rock, (Vineyard Haven)	168
Little Round Shoal	92
Little Schermerhorn Island	608
Little Schodack Island	607
Little Stony Point	599
Little Thatcher Island	69
Livingston's Channel	605, 614
Livingston's Creek	605
Livingston's Dock	605
Livingston's Flats	605, 614
Lloyd's Beach	366, 486
Lloyd's Harbor	366, 475
Lloyd's Harbor Light-house	476, 482
Lloyd's Neck	366, 476, 486
Lloyd's Point	366, 475, 486
Lloyd's Point Shoal	382, 481, 487
Lobster Rock, (Barnstable)	70
Lobster Rock, (Long Island Sound)	392, 436, 437
Lobster or Great Rock	430
Locust Island	373, 509
Locust Point, (Western End of Long Island Sound)	374, 515

L.		M.	
	Page.		Page.
Lone Rock:		Mackerel Cove	251
(Apponagansett Bay,) 220, 222, 224; (Channel between No Man's Land and Martha's Vineyard,) 125; (Mattapoiset Harbor,) 227; (Osterville Harbor,) 143; (Quick's Hole—Western Entrance,) 157, 195; (Quisset Harbor,) 188, 238; (Vineyard Sound—off East Chop,) 168; (Wood's Hole—Great Harbor,) 146; (Wood's Hole—Little Harbor,) 150.		Madison, Village of	351
Lone Tree Creek	72	Madison East Reef	391, 436
Long Beach:		Madison Middle Reef	391, 436
(Gardiner's Bay,) 536; (Manhasset Bay,) 506; (Plymouth Harbor,) 62, 67; (Wareham,) 192, 233.		Maelstrom, The	605, 614
Long Beach Bay	536, 537	Maffitt's Ledge	26
Long Beach Island, (Norwalk Islands)	363, 470	Magazine Point	599
Long Beach Point:		Main Channel:	
(Bridgeport Harbor,) 359, 457; (Delancey's Cove,) 372, 504; (Gardiner's Bay,) 536; (Wareham,) 192, 233.		(Fisher's Island Sound,) 315-326; (Jamaica Bay,) 553; (Long Island Sound,) 374-389; (New York Bay,) 560-565.	
Long Beach Point Light-house	536, 550	Main Part of Pollock Rip	91
Long Beach Point Reef	383, 504, 505	Main Ship Channel, (Boston Harbor)	1-18
Long Beach Point Shoal	542	Main or South Channel, (Nantucket Sound)	109-117
Long Beach Shoal	541	Malden, Village of	605
Long Cove, (Thames River)	410	Mamaroneck, Village of	372, 501
Long Island, (Boston Harbor)	4, 25, 40	Mamaroneck River	372, 500-501
Long Island, (New York)	532, 550-554	Mamicock Cove	410
Long Island Head, (Boston Harbor)	4, 19, 24, 40	Mamicock Hill	410
Long Island Light-house, (Boston Harbor)	4, 53	Manhasset, Village of	506
Long Island Point	4	Manhasset Bay	368, 506-508
Long Island Sound	345-518	Manhasset Cove, (opposite Greenport)	537
Long Island, South Coast of	550-554	Manhasset or Cow Neck	368, 502, 506
Long Ledge, (Gangway Passage)	36, 58	Manhattan Beach	555, 562
Long Ledge, (Narragansett Bay)	263	Manhattan Island	522, 554, 506
Long Neck, (Darion River Entrance)	473	Manney Rock	289, 290
Long Neck, (Wood's Hole)	87, 145, 188	Manomet Hills	68
Long Neck Point, (Darion)	370, 473	Manomet Point	59, 68
Long Neck Point Shoal	382, 471, 473	Manor Hills	353
Long Neck Rock	148, 152	Manursing Island	372, 492, 497
Long Point:		Marion House, (near Wareham)	192, 234
(Greenwich Bay,) 292; (Hudson River,) 601; (Provincetown Harbor,) 77.		Mark's Cove	192, 233
Long Point Bar, (Provincetown Harbor)	77	Marks for Frank's Ledge	413, 417
Long Point Light-house, (Provincetown)	77, 78	Marks for Valiant Rock	375-376, 411
Long Point Shoal, (Greenwich Bay)	293	Marlborough, Village of	601
Long Point Shoal, (Providence River)	265	Marsh Island, (Providence River)	258
Long Rock, (New London Harbor)	413	Marsh Point	272, 292
Long Rock, (Westport Harbor)	242	Marshfield, Village of	60
Long Sand Shoal	340-350, 377, 390, 391, 428	Marshfield Harbor	60
Long Shoal	106, 122	Marshpee River	84
Long Wharf, (Boston Harbor)	10	Martin's Ledge	6, 20
Long Wharf, (New Haven Harbor)	447	Martin's Well	51
Long Wharf Light-house	447, 452	Martha's Vineyard	85-87
Lord's Cove	427	Mary Ann Rocks	66
Lord's Passage	314, 324-325	Mary's Rock	448
Lord's Point	427	Mashnee Island	190
Louisburgh, Village of	601	Mashomuck Point	539
Lovell's Island	3, 13, 19, 25	Mason's Hill	338
Lovett's Rock	265	Mason's Island, (Fisher's Island Sound)	311, 338
Low Point	86, 165	Mason's Island Flats	340, 341, 343
Low Point Flats	166	Mason's Point	311, 338
Lower Bay of New York	556	Matacut Harbor	169
Lower Meadows Shoal	296	Matawan or Middletown Creek	557
Lower Middle, The, (Boston Harbor)	3, 21-22, 27, 32	Mathers' Dock	457
Lower Middle, The, (Wareham River)	235	Matinicock Point	367
Lower Middle Ground, The, (Warren River)	295	Matinicock Point Shoal	503
Lower Mine Point	599	Mattapoiset, Village of	225
Lower Neck	47	Mattapoiset Harbor	191, 225-229
Lower Overslaugh Bar	615	Mattapoiset Ledge	226-227
Lower Quarantine, (New York Bay)	558	Mattapoiset Neck	191, 226
Lower Schodack Island	607	Mattituck, Village of	540
Lucas' Ledge, (Sippican)	232	Mattituck Hills	353
Lucas' Shoal, (Vineyard Sound)	100, 169	Mattituck Inlet	353
Lucas' Wharf	232	Mattituck Pond	353
Lucas' Landing	353	Maudener's or Murderer's Creek, (near Athens, Hudson River)	606
Luddington Rock	380, 396, 448-449	Maudener's Kill, (near Castleton, Hudson River)	608
Ludlow's Wharf	605	Mayo's Beach	73
Lumbard's Cove	86	Mayo's Beach Light-house	73, 75
Lumber District, (Albany)	616	McBlair's Shoal	110-111, 175
Lumber Rock	240-241	McCurry's Point	245
Lump, The, (East Channel—New York Bay)	571	McCurry's Point Shoal	247
Lump, The, (South Channel—New York Bay)	567	Meadow Island	250
Lunatic Asylum Dock, (East River)	522	Meadows, The, (Lloyd's Neck)	266
Lyme, Village of	427	Mechanicsville, Village of	562
Lyme Ferry, Village of	427	Medford, Village of	5
Lynde's Neck	349, 426	Melton's Ledge	414
Lynde's Point	349, 426	Mendell Rocks	231
Lyons' Flats	265	Menemsha Right	86
		Menemsha Pond	86
		Menunketesuck Ledges	432
		Menunketesuck Point	350, 429, 431
		Menunketesuck Point Shoal	430, 432
		Menunketesuck River	350, 429

M.	Page.
Mercer's Rock	412
Merino Point	606
Mermaids, The	443
Mianus, Village of	370, 491
Mianus River	370, 490
Mid-channel Rock	390
Middle, The, (Darlen River)	474
Middle Browster, (Boston Entrance)	1, 13, 18, 25
Middle of Brown's Bank	64
Middle Channel, (Cohasset Harbor)	55, 56-57
Middle Channel, (Nantucket Sound)	105-109
Middle Clump	312-313, 319
Middle Flats, (Edgartown Harbor)	162
Middle Ground, The:	
(Block Island Sound,) 375, 404; (Boston Harbor,) 32, 34;	
(Bristol Harbor,) 298, 299; (Centreville Harbor,) 140, 142;	
(Chatham Roads,) 127-128, 130-131; (Cuttyhunk Harbor,) 202;	
(East River—near Hell Gate,) 524-525; (East River—	
off Governor's Island,) 527; (Edgartown Harbor,) 162;	
(Fisher's Island Sound,) 316, 325, 332; (Hyannis Roads,) 138;	
(Long Island Sound,) 355, 380; (Plum Gut,) 534, 549; (Vine-	
yard Sound,) 99, 169; (Wellfleet Harbor,) 73; (Westport	
Harbor,) 241.	
Middle Ground Light-house, (Long Island Sound)	355, 380
Middle Harbor, (Boston)	5
Middle Ledge:	
(Centreville Harbor,) 14', 142; (Cuttyhunk Harbor,) 202; (New	
Bedford Harbor,) 207, 211-212, 220, 222, 223; (Wareham En-	
trance,) 234; (Wood's Hole,) 148, 152.	
Middle Passage, (Atlantic Ocean)	584
Middle Passage, (Narragansett Bay)	267, 271
Middle Reef, (East River)	522, 526
Middle Reef, (near New Rochelle)	373, 383, 510
Middle Rock:	
(New Haven Harbor,) 448; (off New London Entrance,) 412;	
(New Rochelle Approaches,) 509.	
Middle Shoal, (near Delancey's Point)	372, 505, 509
Middletown, Town of	428
Middletown or Matawan Creek	557
Midway Shoal	534, 549
Mike's Ledge	37
Milebrook Hill	337
Milford, Village of	358, 453
Milford Harbor	358, 453-454
Milford River	358, 453
Milford Roads	359, 453
Military Hospital, (Ward's Island)	521
Mill Cove	288
Mill Creek	372, 499-500
Mill Neck	366, 487
Mill Neck Creek	367, 487
Mill Reef	592
Mill River:	
(New Haven Harbor,) 358, 447; (Southport Harbor,) 361, 466;	
(Stamford Harbor,) 370, 482.	
Mill Rock	162
Miller's Landing	354
Miller's Point	463-464
Miller's Rock	379
Mills' Wharf	603
Millstone Harbor	422
Millstone Point	348, 419
Millstone Point Reef	422
Milton, Village of:	
(Hudson River,) 601; (Long Island Sound,) 499; (Mill Creek,) 372.	
Milton Mills Village	45
Mine Point	601
Mink Point	88, 145
Minot's Ledge	13-14
Minot's Ledge Light-house	12, 53, 55, 67
Minot's Point	46
Minot's Point Flats	46
Misham Ledge	186, 194
Misham Point	186
Mitchell's Bluff	506
Mitche's Kill	608
Mix Islands	609
Mohawk River	610
Mohican Hills	411
Monomoy Island	81
Monomoy Point	61, 81

M.	Page.
Monomoy Point Light-house	61, 81
Montauk Channel	407-408
Montauk Point	309, 550
Montauk Point Light-house	309, 550
Montauk Shoal	404
Montrose Point	598
Monumet, Village of	190
Monumet River	190
Moon Head	40
Moon Head Flats	41, 49
Moon Island	40, 47
Moon Shoal	70
Morgan's Point, (Fisher's Island Sound)	312, 338
Morgan's Point, (near New Haven)	357
Morgan's Point Light-house	312, 338
Moriche's, Village of	551
Moriche's Bay	551
Morris Canal	591
Morris' Cove, (Long Island Sound)	374, 515
Morris' Cove, (New Haven Harbor)	446
Morris Island, (Stage Harbor)	131
Morris Island Point	131
Morris' Rock	481, 487
Morrisania, Town of	520
Mosher Ledge	195, 214
Mosher's Point	205
Mosquito Cove	502
Mosquito Neck	502
Mott's Cove	502
Mott's Landing	502
Mott's Point, (Hempstead Harbor)	368, 502
Mott's Point, (Manhasset Bay)	368, 506
Mott's Point Shoal	503, 504
Mount Bowdoin	44
Mount Carmel	351, 358, 446
Mount Decatur	410
Mount Gulian	600
Mount Hope	300
Mount Hope Bay	300-303
Mount Hope Point	300
Mount Hope Point Shoal	302
Mount Horton	410
Mount Ida	610
Mount Misery	354, 463
Mount Misery Point	354
Mount Misery Shoal	379, 464
Mount Olympus	610
Mount Prospect	313
Mount St. Vincent	596
Mount Sinai Harbor	354
Mount Tom Rock	262
Mount Wollaston	47
Mud Cove or Passecunquis Cove	258
Mud Hole, The, (Hudson River)	600
Mud Hole, The, (New York Entrance)	576
Mud Holes, The, (New York Entrance)	574-576
Muddy Brook	361
Mulberry Point	351, 435
Mulford's Point, (Brown's Hills—Long Island)	352
Mulford's Point, (near Horton's Point)	353
Mulligan's Reef	478
Mull's Island	607
Mull's Flaot	607
Mumford's Cove	314
Mumford's Point	314
Murderer's Creek	600
Murderer's or Maudener's Creek	606
Muscle Bank	64
Muscle Bed Shoals	302
Muscle Bed Shoals Light-house	297, 300, 303
Muskeget Bank	119
Muskeget Channel	119-124
Muskeget Rock	119
Mussel Point	69
Mutton Shoal	119-120, 121
Mystic, Town of	339
Mystic Bridge, Village of	339
Mystic River, (Boston Bay)	5
Mystic River, (Fisher's Island Sound)	338-344
N.	
Nannaquacket Pond	245
Nantasket, Village of	2, 13

N.	Page.	N.	Page.
Nantasket Beach	2, 13	New London Light-house	347-348, 408, 419
Nantasket Gut	47	New Paltz or The Highlands, Village of	601
Nantasket Hill	2, 23, 41	New Rochelle, Village of	372, 508
Nantasket Hills	2	New Rochelle Harbor	373, 508-513
Nantasket Roads	10, 12, 15	New Shoal	566
Nantucket, Town of	158	New Shoreham, Village of	364
Nantucket Cliff Beacons	159	New South Shoal	177
Nantucket Harbor	158-159	New Suffolk, Village of	540
Nantucket Island	81-82	New Suffolk Peninsula	540
Nantucket Light-house	82, 185	New Utrecht, Village of	558
Nantucket Shoals	82, 174-185	New Windsor, Village of	609
Nantucket Shoals, Bottoms and Characteristic Soundings on	178-179	New York, City of	521, 554, 596
Nantucket Sound	81-174	New York Bay and Harbor	564-595
Napatree Beach	310, 337	New York State Penitentiary	597
Napatree Point	310	Newark, City of	591
Napatree Point Ledge	315-316	Newark Bay	591-593
Napeague Bay	310, 385, 398, 405, 406, 407	Newark Marshes	531
Napeague Harbor	310, 398	Newburgh, City of	600
Napeague Neck, (Thames River)	410	Newburgh Bay	600
Narragansett Bay	249-304	Newcomb's Landing	48
Narragansett Beach	306	Newport, City of	250, 278
Narragansett Pier, Village of	268	Newport Harbor	250, 278-284
Narrow River	537	Newport Harbor Light-house	255, 278, 284, 306
Narrow or Pettaquamscot River	268	Newton's Rock	251, 260, 273, 279, 285
Narrows, The:		Newtown Creek	523
(Boston Harbor,) 3; (Duck Island Harbor,) 477; (Kickamuit River,) 301; (New York Harbor,) 558; (Weymouth Back River,) 51.		Newtown Landing	519
Narrows Light-house, (Boston)	3, 53	Niantic, Village of	348, 419
Nashawena Flats	157	Niantic Bay	348, 413-424
Nashawena Island	89, 156, 187, 201	Niantic River	348, 420
Nash's Rock	7, 14-15, 42	Nichol's Point	537
Nasketucket Bay	191	Nichol's Point Shoal	546
Nasketucket River	191	Nicoll's Point	552
Nauset Beach	80	Nine Mile Tree Light	608, 620
Nauset Beacons	62, 80	Ninigret or Pawawget Pond	306
Naushon Island	88, 187	Nissequague, Village of	364
Naushon Point Shoal	148, 152	Nissequague River	334, 454
Naval Station, (New London)	410	Nix's Mate or Nick's Mate	3, 8, 27
Naval Torpedo Station, (Newport Harbor)	254, 278	Nix's Mate Beacon	3, 8, 19, 27
Navesink or Highland Light-houses	554, 594	No Man's Land	121
Navesink River	555	Noank, Village of	312, 338
Navy Anchorage, (Wallabout Bay)	523	Nobska Point, (Buzzard's Bay)	192, 233
Navy Trial Course, (New York Bay)	561	Nobska Point, (Vineyard Sound)	61, 87, 144-146
Navy Yard, (Brooklyn)	523	Nobska Point Ledge	100
Navy Yard, (Charlestown)	5	Nobska Point Light-house	61, 87, 144-145, 154
Navy Yard Point	11	Noddies Island	5, 34
Nayat Point	257	Noddies Island Shoals	94
Nayat Point Shoal	263	Nonamesset Island	88, 145
Neck, The, (Rhode Island)	260, 264	Nonamesset Point Shoal	145, 147, 151
Ned's Point	191, 226	Nonquit Pond	244
Ned's Point Light-house	191, 226, 229, 239	Norroaton Bay	370, 474
Ned's Point Shoal	227, 229	Norroaton Neck	370, 473
Negro Heads, The, (Hell Gate)	622	Norroaton Point	362, 469
Negro Heads, The, (Long Island Sound)	357, 395, 442, 444	Norroaton Point Shoal	471-472
Negro Ledge	214	North Bay, (Cruzer's Island)	004
Negro Point, (Hell Gate)	521	North Bay, (Hudson City)	606
Negro Point Bluff	521	North Beacon, (Scituate)	59
Neponset, Village of	45	North Brother, The, (off Four Mile River)	424
Neponset River	44-46	North Brother, The, (Hell Gate)	520
Nes' or Easby's Rock	526	North Brother Light-house	620, 633
Nestpoll Marsh	553	North Brothers, The, (New Rochelle Approaches)	510
Nettle's Reef	592, 486	North Channel:	
New Baltimore, Village of	607	(Boston Harbor,) 8, 22, 32; (Broad Sound—Boston Bay,) 30-31; (Fisher's Island Sound,) 326-328; (Long Island Sound,) 350, 389-402; (Nantucket Sound,) 89-104.	
New Baltimore Dike	607	North Cove, (near Essex)	427
New Baltimore Dike Light	607, 620	North Cove, (near Saybrook)	426
New Baltimore Light	607, 620	North Dennis, Village of	69, 72
New Bedford, City of	190, 205	North Dumpling	313-314, 320
New Bedford Harbor	190, 205-219	North End of Bartlett's Reef	421
New Breach or Griswold's Point	349, 426	North Falmouth, Village of	188
New Brighton, Village of	558	North Ferry	270
New Brunswick, Town of	588	North Hammock	313-314, 320
New Dock, (Entrance to Nissequague River)	364	North Hammock Light-house	313-314
New Dorp Beacon	557, 594	North Haverstraw, Village of	597
New Hamburg, Village of	900	North Hill, (Fisher's Island)	307, 313
New Haven, City of	358, 446	North Ledge, (New Bedford)	208, 212, 214-215
New Haven Harbor	358, 445-453	North Neck, (Edgartown)	85, 160
New Haven Tower	448	North Pier	427
New Inlet	552	North Pocasset, Village of	189
New Jersey Beach	556	North Point:	
New London, City of	347, 409	(Conanicut Island,) 252, 270; (Papasquash Neck,) 264, 294; (Prudence Island,) 263, 266, 272.	
New London Harbor	347, 408-419		

INDEX.

XVII

N.	Page.
North Point of Governor's Island Flats, (Boston Harbor)-----	34
North Reach-----	587
North or Hudson River-----	595-621
North River or Marshfield Harbor-----	60
North River Bridge-----	60
North Sea Harbor-----	540
North Shore, Village of-----	559
North Shores of-- (Buzzard's Bay,) 186-187; (Nantucket Sound,) 83-84; (Vinoyard Sound,) 87-89.	
North Weymouth, Village of-----	48
Northeast Beacon-----	458
Northeast Bluff-----	366, 481
Northeast Grave-----	5-6, 19-20, 25
Northeast Lodge of The Graves-----	5-6, 19-20, 25
Northeast Reef-----	498
Northern Passage, (Atlantic Ocean)-----	584
Northern Passage, (Newport Harbor)-----	278, 281-284
Northport, Village of-----	477
Northport Bay-----	366, 475
Northport Beach-----	478
Northport Harbor-----	477
Northwest Bluff-----	366, 486
Northwest End of The Lower Middle, (Boston Harbor)-----	9, 22, 28, 33
Northwest Ledge-----	231
Northwest Middle-----	549
Northwest Point, (Patience Island)-----	272
Northwest Point, (Plum Island)-----	549
Northwest Point Reef-----	320, 329
Northwest Reach-----	587
Northwest Shores of Buzzard's Bay-----	190-192
Northwest Spit of Nix's Mate-----	8
Norton's Rock-----	100, 169
Norton's Shoal-----	106, 113, 122-123
Norwalk, Town of-----	362, 471
Norwalk Beacon-----	470
Norwalk Island Eastern Shoal-----	381
Norwalk Islands-----	362-364, 469-471
Norwalk Light-house-----	363, 469, 473
Norwalk River-----	362, 469-471
Norwich, City of-----	411
Nott's Island-----	427
Nova Scotia Bar-----	553
Noyack, Village of-----	539
Noyack Bay-----	539
Noyes' Hill-----	337
Noyes' Point-----	306, 310
Noyes' Rocks-----	320, 332, 334, 335
Nut Island-----	40, 47
Nutzen Hook-----	606
Nyack, Town of-----	597
Nyack Flats-----	597, 611
Nye's Flar-----	237
Nye's Ledge-----	196, 226
Nye's Neck-----	188
Nye's Neck Point-----	188
Nye's Wharf-----	230

O.	Page.
Oak Bluff Settlement-----	36, 165
Oak Hill, (Hudson River)-----	605
Oak Hill Depot-----	605
Oak Island-----	551
Oak Neck, (Long Island Sound)-----	367, 487
Oak Neck Point-----	367
Ocean House, (New London Harbor)-----	409
Ochre Point-----	250
Ohio Ledge-----	262-263, 275, 295
Off Spot, The, (New York Entrance)-----	567, 570
Old Aquabogue, Village of-----	540
Old Bartlemy-----	208, 216
Old Bay Rock-----	302
Old Bull Rocks-----	246-247
Old Cock, The-----	193, 240
Old Ferry Point-----	519
Old Field Point-----	355
Old Field Point Light-house-----	355
Old Fields-----	404
Old Fort Griswold-----	409
Old Gay Rock-----	289
Old Harbor: (Boston Bay--near Cohasset,) 13; (Boston Harbor--near Ne- ponset Entrance,) 44; (Chatham,) 80.	

O.	Page.
Old Harbor Beach-----	55
Old Harbor Flats-----	45
Old Harbor Point-----	44
Old Harbor Shoal-----	45
Old Head Reef-----	449
Old Hen, The, (Hempstead)-----	367, 383, 502, 504, 507
Old Kelsey's Point-----	350
Old Lime Kiln, The-----	601
Old Maid's Cove-----	259
Old Man Ledge-----	125
Old Man Shoal, (Nantucket Shoals)-----	176
Old Mill Creek-----	257
Old Orchard Point-----	557
Old Orchard Shoal-----	592, 588
Old Pier, (Killingworth Harbor)-----	435
Old Pier, (Westbrook Harbor)-----	430
Old Silas-----	308, 346
Old South Shoal, (Nantucket Shoals)-----	177
Old Sow, The, (Long Island Sound)-----	354, 379
Old Sow, The, (Wellfleet Harbor)-----	74
Old Spain, Village of-----	48
Old Swale Marsh-----	553
Old Warwick Cove-----	292
Old Wells or South Norwalk-----	471
Olympus, Mount-----	610
One Hundred and Forty-five Fathom Hole-----	574
Onset Island-----	190
Orient, Village of-----	537
Orient Harbor-----	537
Orient Shoal-----	352, 378
Osborne's Wharf-----	246
Osher's Rocks-----	37
Osterville, Village of-----	84, 143
Osterville Grand Island-----	84, 143
Osterville Harbor-----	84, 143-144
Otis' Hill-----	51
Outer Bar, (East Coast of Cape Cod)-----	89
Outer Brewster, (Boston Entrance)-----	1, 13, 18
Outer Coot Rock-----	432
Outer Eighteen Feet Rip-----	175
Outer Flats, (Edgartown Harbor Approaches)-----	114, 161
Outer Harbor: (Edgartown Harbor,) 160; (New Bedford Harbor,) 205; Pocas- set Harbor,) 235.	
Outer Middle Ground-----	569
Outer Minot, The-----	12, 14, 55
Outer or Southwest Beacon-----	458
Outer Seal Rock-----	53
Outer Thimble, The-----	356
Overslaugh, Lower-----	615
Overslaugh, Upper-----	609, 616
Oyster Bay-----	366, 486-490
Oyster Bay, Village of-----	487
Oyster Bay Harbor-----	366, 486
Oyster Bed Flats-----	264-265
Oyster Island-----	559
Oyster Island Flats-----	563
Oyster Point-----	446-447
Oyster Pond Peninsula-----	536
Oyster Pond Point-----	362, 536
Oyster Pond Reef-----	536, 549
Oyster River, (near Cornfield Point)-----	350
Oyster River or Cove Creek-----	446
Oyster River or Clark's Point-----	358, 446

P.	Page.
Packet Rock-----	215
Packet Rock Ledge-----	215
Padanaram, Village of-----	190, 205, 219
Padanaram Harbor-----	190, 205, 219-224
Palestine Shoal-----	561
Palisades, The-----	586
Palmer's Hill, (Stonington)-----	311, 331
Palmer's Island-----	206
Palmer's Island Light-house-----	206, 225
Palmer's Island Shoal-----	209, 217
Palmipaw, Village of-----	569
Palmyra Rock-----	9, 22, 28
Pamet River-----	76
Pamet River Village-----	76
Papola Creek-----	588
Papscanee's Bar-----	609, 615

P.	Page.	P.	Page.
Papscanee's Flats	615	Phillips's Landing	
Papscanee's Point	609	Phillis' Island	
Paquatannock, Village of	410	Phinney's Harbor	
Paquatannock Cove	410-411	Phinney's Rock, (New Bedford Harbor)	
Paquatannock Hill	410	Phinney's Rock Ledges, (Buzzard's Bay)	
Paquatannock Point	411	Picket Rock	
Parada Hook	608	Picnic Point	
Park Island, (Hudson River)	609	Pier Head, (Plymouth)	
Park Point	359, 457	Pierce Rock	
Parker's Flats	146	Piermont, Village of	
Parker's Neck	87, 145	Piermont Flats	
Parker's River	83	Piermont Wharf	
Parsonage Point	372, 500	Pig Rocks	48-49, 50
Party's Bar	449	Pilot Boats of New York and New Jersey	577, Appendix II
Pasque Island	88, 156, 187	Pilot Hill, (Block Island)	364
Passage between Long Island Head and Nix's Mate, (Boston Harbor)	42-43	Pilots of New York Harbor	577, Appendix II
Passaic, Village of	591	Pine Creek	361
Passaic Flats	591, 592-593	Pine Creek Point	361, 459-460
Passaic Light-house	591, 593, 594	Pine Creek Point Shoal	381, 459-460, 465
Passaic River	591	Pine Hill	252, 256, 271
Passaconquis or Mud Cove	258	Pine Hill Ledge	271, 274-275
Patchogue, Village of	552	Pine Hill Point	252, 271
Patchogue Bay	552	Pine Island, (off Kellogg's Cove)	372, 506
Patchogue Creek	552	Pine Island, (off New London)	347
Paterson, Town of	591	Pine Island Channel	326, 342, 347
Patience Island	253, 272	Pine Island Rocks	509-510
Pataguansett River	348, 424	Pine Island Shoal	415
Paul's Point	86	Pine Neck Cove	225
Pawawget or Ninigret Pond	306	Pine Point	531
Pawcatuck Bridge	337	Pink Rock	79
Pawcatuck Point	337	Pipes' Cove	538
Pawcatuck Point Reef	338	Pipes' Neck	537
Pawcatuck River	337	Pixtaway Creek	618
Pawtuxet, Village of	258	Pixtaway Island	618
Pawtuxet Beacon	258, 264	Pixtaway Point	618
Pawtuxet Cove	258	Planter's Hill	51
Pawtuxet River	258	Planting Island	320
Pea Island	373	Plawchy, Village of	605
Peacock Point	367	Plawchy Flats	602, 612
Peaked Hill Bar	89	Pleasant Bay	89
Pearce's Rock	298	Ploughshare Point	587
Pease's Ledge, (Cuttibunk Harbor)	203	Plum Beach	506
Pease's Point	191, 230	Plum Beach Shoal	273, 286-287, 288
Peck's Ledge	468	Plum Gut	352, 386, 402-403, 334, 549-550
Peck's Point	370, 482	Plum Island	346-347, 554
Peck's Point Rock	484	Plum Island Light-house	347, 554, 560
Peconic Bay, Great	540	Plum Island Point	347
Peconic Bay, Little	540	Plum Island Rock	541
Peconic River	540	Plum Point	610
Peddock's Island	47	Plymouth, Town of	63
Peekskill, Town of	598	Plymouth Bay	67-68
Peekskill Bay	598	Plymouth Harbor	62-67
Pelham, Village of, (Hudson River)	602	Plymouth Light-houses	62, 67
Pelham Bay, (Long Island Sound)	374, 515-516	Pocasset Harbor	189, 235-236
Pelham Dock, (Hudson River)	602	Pochick Reef	175
Pelham Neck	374, 515	Poesten Kill	619
Pelham Point	515	Poge, Cape	85, 160
Pelican Beach	553	Point Allerton	2, 13
Pelican Island, (Greenwich Cove)	490	Point Allerton Bar	7, 14
Pelican Island, (Jamaica Bay)	563	Point Allerton Beacon	7, 14
Pelican Point	490	Point Comfort	556
Pell or Scopus Island	602	Point Comfort Beacon	556
Pelt Rock	478	Point Comfort Shoal	588
Pen or Prince's Head	47	Point Gammon	83, 134
Penfield's Reef	360, 380-381, 458, 460	Point Judith	268, 306
Penfield's Reef Light-house	300-361, 381, 458, 461, 463	Point Judith Light-house	268, 306, 268
Penguin Shoal	332, 334, 335	Point Judith Neck	458, 460
Penikese Island	187, 201	Point Rock	458, 460, 461
Pequannock River	359, 457	Point Rock Shoal	3, 19, 25
Pequot, Village of	409	Point Shirley	272, 291
Pequot Hill	339	Pojack Point	527
Pequot Point	409	Polhemus' Dock	90
Perey's Reach	306, 615	Pollock Rip	91
Perth Amboy, Village of	557, 587	Pollock Rip Light-vessel	699
Peter's Neck	537	Polopens Island	256, 264
Peter's Neck Point	537	Pomham Beacon	258, 303
Pettaquamscot River	268	Pomham Rocks Light-house	358
Petty's Bight	352	Pond Point	880, 453
Petunk, Village of	551	Pond Point Shoal or Reef	76
Phelps' Bank, (Nantucket Shoals)	177	Pond Village	551
Phelps' Ledge, (Block Island Sound)	464	Ponguogque Point	520
Phillips' Head	48	Poor Men's Bowery	

INDEX.

XIX

P.	Page.
Popasquash Neck	256, 294, 296
Popasquash Point	256, 296
Popasquash Point Shoal	299
Pope's Island	206
Poplar Point	271, 288
Poplar Point Light-house	271, 288, 291, 303
Popponesset Bay	84, 144
Poquonock, Village of	347
Poquonock River	347
Port Chester, Village of	371, 497
Port Ewen, Village of	603
Port Jefferson, Village of	354, 463
Port Jefferson Harbor	354, 463-464
Port Monmouth	556
Port Morris	520
Port Richmond, Village of	559
Portersville, Village of	339
Portsmouth Grove, (Narragansett Bay)	256
Pot Cove	522
Pot Rock	525
Pot Rock Island	356
Potowomut Neck	272, 292
Potowomut Point	292
Potowomut River	272, 291
Potowomut Rocks	293
Potter's Cove, (Conanicut Island)	255
Potter's Cove, (Prudence Island)	252, 256
Potter's or Sea-Flower Reef	323, 342-343, 416
Poughkeepsie, City of	601
Poverty Island	349, 426-427
Poverty Island Beach	349, 426
Poverty Point	349, 427
Powder Island	409
Powder Point	63
Prall's Island	587
Premium Point	372, 504, 505
President's Roads	5
Price's Bend or Cow Harbor	477
Price's Neck	250
Priming Hook	606
Prince's Head	48
Prince's Head Shoals	48
Princess Bay	557
Princess Bay Light-house	557, 594
Prospect Hill, (Fisher's Island)	307, 313
Prospect Hill, (Martha's Vineyard)	86
Prospect Park Hotel	605
Prospect Point	367, 502
Prospect Point Shoal	383, 503-504, 506-507
Providence, City of	250
Providence River	257-259
Provincetown, Town of	77
Provincetown Harbor	76-78
Prudence Island	252-253, 271
Prudence Island Light-house	252, 255, 303
Puddecart Point	605
Pullen's Point	597
Pulpit, The	231
Pumpkin Patch	553

Q.

Quaker Hill, (New London Harbor)	409
Quaker Hill, (Sakonnet River)	245
Quamino Rock	55
Quanaduck Cove	331
Quarantine Rocks	41
Quarantine Station, (Boston Harbor)	41
Quarantine Stations, (New York Harbor)	558
Quarry Ball Island	490
Quiambog Cove	311
Quick's Hole	88, 156-158, 187
Quick's Hole Ledge	117, 157
Quicksand Point	242, 243
Quincy, Village of	47
Quincy Bay	47
Quincy Great Hill	40, 47
Quinnepeg Rocks	409
Quinnebang River	408
Quinnipiac River	358, 447
Quisset or Quamquisset Harbor	188, 238
Quisset Point	233
Quixe's Ledge	358, 446, 448

Q.

	Page.
Quogue, Village of	551
Quohog Bar	234-235
Quonset Point	271, 288
Quonset Point Shoal	274, 290

R.	
Raccoon Island	48
Race, The	307, 346
Race Point, (Cape Cod)	61, 76
Race Point, (Entrance to Long Island Sound)	307, 313, 346
Race Point Light-house	61, 76, 78
Race Rock	307, 346, 412
Race Rock Light-house	307, 346, 412
Ragged Island	51
Ragged Rock	448
Ragged Rocks	220
Rahway, Town of	588
Rahway River	588
Railway Ledge	146
Railway Village	45
Rainsford's Island	41
Ram Head	537
Ram Island:	
(Block Island Sound,) 309, 525; (Fisher's Island Sound,) 312, 339;	
(Norwalk Islands,) 363, 470; (Shelter Island Sound,) 537; (Sip-	
pican Harbor,) 230.	
Ram Island Channel, (Gardiner's Bay)	535
Ram Island Flats, (Fisher's Island Sound)	312, 339, 341, 343
Ram Island Flats, (Gardiner's Bay)	545
Ram Island Hammock	363, 470
Ram Island Reef, (Fisher's Island Sound)	312, 318-319, 327, 334, 339
Ram Island Shoal	231
Ram's Head	21, 26
Ramshorn Creek	605
Ramshorn Point	605
Randall's Island	521
Randall's Rock	229
Rapid Rock	412, 420-421
Raritan Bay	556, 588-590
Raritan Flats	589
Raritan River	588-590
Rassepeague Bluffs	364
Rat Island	374, 512
Ravenswood, Village of	523
Red Brook Harbor	189, 235-236
Red Hook, (Brooklyn)	523, 559
Red Hook, (Hudson River)	598
Red Hook Flats, (East River)	529
Red Hook or Slippe Stein Island	604
Red Hook Landing	598
Red Ledge	145-146, 148, 151-152
Red Reef	341
Red River	83
Red River Flats	128, 131
Red Rock	70
Red Spring Point	367, 502
Reform School-Ship of New York	373, 512
Rendezvous Creek	69
Rescue Rock	232
Rhinebeck, Village of	603
Rhode Island	249-250
Rhodes' Folly	337
Ribbon Reef	193, 202
Ricketson's Point	190, 205, 219
Ridge, The	80
Riding Rocks	436
Riker's Island	520
Riker's Island East Flats	524
Riker's Island West Flats	520, 524
Ringgold's Dock	534
Ring's End, Village of	473
Riverdale, Village of	596
Riverhead, Village of	540
Roads, The, (Block Island)	305
Roanoke Landing	354
Roanoke Point	353-354
Roanoke Point Shoal	378
Roaring Balls, The	20, 25-26
Robbins' Island	540
Robbins' Island West Flats	543
Robbins' Reef	563, 592
Robbins' Reef Light-house	559, 594

R.	Page.
Robinson's Hole	88, 187
Rochdale, Village of	591
Rock Creek	72
Rock Island, (Hudson River)	605
Rock Island, (Providence River)	258
Rock Island Cove	48
Rock Island Head	48
Rockaway Beach	553
Rockaway Inlet	552-554
Rockaway Shoals	553, 572
Rockland Hills	13
Rockland Lake	591
Rockland Lake Landing	597
Rocky Hill	410
Rocky Island, (near David's Island)	509
Rocky Island, (Greenwich Cove)	491
Rocky Neck, (Long Island Sound)	370
Rocky Neck, (Narragansett Bay)	257, 272
Rocky Point:	
(Hudson River,) 602; (near Mount Misery,) 354; (Narragansett Bay,) 257, 272; (North Shore of Block Island Sound,) 306; (Plymouth Bay,) 66, 67; (Shelter Island Sound,) 598; (South Shore of Block Island Sound,) 309; (Truman's Beach,) 352.	
Rocky Point, Village of	537
Rocky Point Landing	354
Rocky Point Shoals	379
Rodgers' Island, (Hudson River)	606
Rodgers' Island, (Long Island Sound)	356
Rodgers' Island Flats	615
Rodman's Neck	374, 515
Rogers' Shoal	127, 129
Roha Hook	607
Roha Hook Light	607, 620
Rolleff Jansen's Kill	605
Romer Shoal or The Romer	560-561, 566, 571
Rondout, Town of	603
Rondout Creek	603
Rondout Light-house	603, 620
Roosevelt, Village of	601
Rose and Crown, The	175
Rose Cove	519
Rose Island	254, 278-279
Rose Island Light-house	254, 278-279, 284, 303
Rose Island North Shoal	260, 283
Rose Island Point	260, 281
Roslyn, Village of	367, 502
Rossville, Village of	588
Round Battery	523
Round Beach Island	363, 471
Round Hill, (near New Bedford)	186, 205
Round Hill Point	186, 205, 219
Round or Rodgers' Island	356
Round Rock:	
(Cohasset Harbor,) 55; (Greenwich Bay,) 292; (Narragansett Bay,) 271; (New Haven Entrance,) 380, 395-396, 447.	
Round Shoal, (Hudson River)	616
Round Shoal, (New York Bay)	562, 589
Round Shoal, Great, (Monomoy)	91-92, 110
Round Shoal, Little, (Monomoy)	92
Ruffle Bar, (Jamaica Bay)	553
Ruggles' Creek	48
Ruland's Hills	551
Rumstick Neck	256, 294
Rumstick Point	256, 294
Rumstick Rock	263
Rumstick Shoal	263, 295
Russel's Neck	539
Rye, Village of	372, 499
Rye Neck	372, 499
Rye Point	372, 499
Rye Point Ledge	500
Rylander's Reef	526
S.	
Sabine's Flats	264
Sabine's Point	258
Sabine's Point Light-house	258, 303
Sabine's Point Shoal	264
Sachem's Head	355, 439
Sachem's Head Harbor	355, 439-441
Sachuest Beach	244
Sachuest Neck	244, 249-250

Sachuest Point	244
Saddle-Bags, The	531
Sag Harbor	538
Sag Harbor, Town of	538
Sag Harbor Bar	538
Sagamore Head	538
Sagg Village	538
Sailing Directions:	
Acoakset River, 242, 243; Anchorage under Black Point, 243; Anchorage off Branford Point, 401; Anchorage on the Eastern Side of Horse Island, 400; Anchorage on the Eastern Side of Long Neck Point, 387; Anchorage to the Eastward of Flagg and Ball Islands, 401; Anchorage off Four Mile River, 425-426; Anchorage under Hummonasset Point, 435; Anchorage between Hart and City Islands, 389; Anchorage between High Island and the Bare Islands, 400; Anchorage between Kidd's Island and Horse Island, 400; Anchorage off Madison, 400; Anchorage to the Westward of Brown's or Huycock Point, 400-401; Anchorage off Whitestone Creek, 423-424; Apponagansett Bay, 221, 223, 224; Arthur Kill, 590;—	
Back or Western Way, (Boston Harbor,) 42; Barnstable Harbor, 70-71; Bass River Roads, 132, 133-134; Black Rock Channel, (Boston Harbor,) 39-40; Black Rock Harbor, 462; Block Island Channel, 405-408; Block Island Sound, 384, 405-408; Boston Harbor, 10-12, 15-17, 23-24, 29-30, 31, 33, 35-36, 38-39, 39-40, 42, 43; Branford Harbor, 443, 444, 445; Bridgeport Harbor, 459, 460; Bristol Harbor, 298, 299-300; Buttermilk Channel, 529-530; Buzzard's Bay, 198-201; Byram River, 498, 499;—	
Cape Ann to Nantucket and Vineyard Sounds, 118-119; Cataumet Harbor, 237; Catumb Passage, (Fisher's Island Sound,) 324; Centerville Harbor, 141, 142; Channel between No Man's Land and Martha's Vineyard, 125-126; Chatham Roads, 128, 129-130, 131; Clark's Cove, 224-225; Cockenoe's Island Harbor, 468-469; Cohasset Harbor, 55-56, 56-57; Cohasset Narrows, 200; Connecticut River, 428-429; Cos Cob Harbor, 494-495; Cuttyhunk Harbor, 205, 204;—	
Darien River, 474, 475; Dartmouth Harbor, 221, 223, 224; Delancey's Cove, 504-505; Duck Island Harbor, 432-433, 434; Dutch Island Harbor, 286, 287;—	
East Channel, (New York Bay,) 571-572; East Coast of Cape Cod, 101; East Harbor, 322, 330; East River, 527-531; Eastern Passage of Narragansett Bay, 265-268; Edgartown Harbor, 163-164;—	
False Hook Channel, (New York Bay,) 570; Fisher's Island Sound, 321-322, 323, 324, 325, 326, 327-328, 329-330; Fort Pond Bay, 386, 399, 406, 407; Fourteen Feet Channel, (New York Bay,) 573;—	
Gangway Passage, (Boston Harbor Approaches,) 38-39; Gardner's Bay and Tributaries, 543-545, 548, 549-550; Gedney's Channel, (New York Bay,) 563-565; Gloucester to Nantucket and Vineyard Sounds, 118; Governor's Island Channel, (Boston Harbor,) 35-36; Great Captain's Island Harbor, 496-497; Great Peconic Bay, 544, 548; Greenport Harbor, 543-544; Greenwich Bay, 293; Greenwich Cove, 491-492, 494; Guilford Harbor, 436, 437-439;—	
Hempstead Harbor, 503, 504; Hingham Harbor, 52-53; Hog Island Harbor, 238; Holmes' Hole, 167, 168, 170; Hudson River, 616-620; Huntington Bay, 479-481, 481-482; Hutchinson's River, 516; Hyannis Roads, 137, 138-139; Hypocrite Channel, (Boston Harbor,) 23-24;—	
Kellogg's Cove, 505-506; Kill Van Kull, 593; Killingworth Harbor, 435;—	
Little Captain's Island Harbor, 495; Little Neck Bay, 514, 515; Little Peconic Bay, 544, 548; Long Island Sound, 384-389, 396-402, 402-403; Lord's Passage, (Fisher's Island Sound,) 323;—	
Main Channel, (Fisher's Island Sound,) 321-322; Main Channel, (Long Island Sound,) 384-389; Main Channel, (New York Bay,) 563-565; Main Ship Channel, (Boston Harbor,) 10-12, 15-17; Main or South Channel, (Nantucket Sound,) 116-117; Mamaroneck River, 501; Manhasset Bay, 507, 508; Mattapocet Harbor, 228-229; Mianus River, 494-495; Middle Channel, (Nantucket Sound,) 109; Middle Passage of Narragansett Bay, 267; Milford Harbor, 454; Mill Creek, 500; Montauk Channel, 407-408; Mount Hope Bay, 303; Muskeget Channel, 120-121, 122, 123; Mystic River, 340-341, 342, 343-344;—	
Nantucket Harbor, 159; Nantucket Shoals—Passing Outside of	

S.	Page.
Long Is. Sections—Cont'd:	
179-183; Nantucket Sound, 101-103, 104, 109, 115-117; Napeague Bay, 385, 398, 405, 406, 407; Napeague Harbor, 398; Narragansett Bay, 265-268, 276-277; Neponset River, 46; New Bedford Harbor, 210-211, 212-213, 217-219; New Haven Harbor, 450-452; New London Harbor, 414-415, 417-418; New Rochelle Harbor, 510, 511, 513; New York Bay and Harbor, 565, 566-567, 568-569, 570, 571-572, 573; Newark Bay, 593; Northport Harbor, 281, 282, 284; Niantic Bay, 422-424; North Channel, (Broad Sound—Boston Bay,) 31, North Channel, (Fisher's Island Sound,) 327-328; North Channel, (Long Island Sound,) 396-402; North Channel, (Nantucket Sound,) 101-103, 104;—	
Osterville Harbor, 144; Outside of Nantucket Shoals, 179-183; Oyster Bay, 488-489;—	
Padanaram Harbor, 221, 223, 224; Passage between Long Island Head and Nix's Mate, (Boston Harbor,) 43; Pellam Bay, 516; Plum Gut, 386, 402-403, 549-550; Plymouth Harbor, 65, 66; Pocasset Harbor, 235-236; Port Jefferson Harbor, 464; Providence River, 266; Provincetown Harbor, 77-78;—	
Quick's Hole, 157-158;—	
Raritan Bay and River, 589-590; Red Brook Harbor, 235-236;—	
Sachem's Head Harbor, 440-441; Sag Harbor, 548; Sakonnet River, 248, 249; Salem to Nantucket and Vineyard Sounds, 117-118; Sandy Hook Bay, 590; Scituate Harbor, 59; Sculpin Ledge Channel, (Boston Harbor,) 43; Sheffield Island Harbor, 472-473; Shirley Gut, (Boston Harbor,) 33; Sippican Harbor, 252; Smithtown Bay, 465; South Channel, (Broad Sound—Boston Bay,) 29-30; South Channel, (Fisher's Island Sound,) 329-330; South Channel, (Long Island Sound,) 402-403; South Channel, (New York Bay,) 568-569; South or Main Channel, (Nantucket Sound,) 115-117; Southport Harbor, 465, 466; Stamford Harbor, 483-484, 485-486; Stonington Harbor, 332-333, 334, 336; Stratford Harbor, 456; Sugar Reef Passage, (Fisher's Island Sound,) 323; Swash Channel, (New York Bay,) 566-567;—	
Tarpanlin Cove, 155-156; The Gangway, (Boston Harbor Approaches,) 38-39; Thimbles Channel, (Long Island Sound,) 397-398;—	
Vineyard Haven, 167, 168, 170; Vineyard Sound, 101-103, 104, 109, 115-117;—	
Wareham River, 235; Warren River, 295-296; Watch Hill Passage, (Fisher's Island Sound,) 321; Wellfleet Harbor, 74-75; West Harbor, 322, 327, 330; Westbrook Harbor, 430-431; Westcott's Cove, 388; Western Passage of Narragansett Bay, 276-277; Westport Harbor, (Long Island Sound,) 467; Westport Harbor, (Massachusetts,) 242, 243; Weymouth Fore River, 49, 50; Wickford Harbor, 289-290, 290-291; Wicopasset Passage, (Fisher's Island Sound,) 326; Wild Harbor, 237; Wood's Hole, 146-147, 149-150, 151, 153-154.	
Sailor's Island	51-52
Sailor's Snug Harbor	48
St. Croix Pier	427
St. Patrick's Rock	282, 283
Sakonnet Point	243
Sakonnet River	243-249
Sally's Rock	293
Salt Island	429
Salten Point	69
Salter's Point	186
Salter's Point Ledge	194, 207
Salterville, Village of	559
Sammy's Beach	535
Sammy's Beach Point	535
Sampawam's Creek	552
Sampson's Island	143
Sand Bar, The	80, 89
Sand Point, (Conanicut Island)	252, 270
Sand Point, (Prudence Island)	252, 256
Sand Spit, The, (New Bedford Entrance)	194, 207, 211
Sand Spit, The, (Shelter Island Sound)	539, 546
Sands' Landing, (Block Island)	305
Sands' Point	368
Sands' Point Light-house	368
Sands' Point Reef	383, 507
Sandwich, Village of	68
Sandwich Harbor	68
Sandwich, West, Village of	68
Sandy Hammock	363, 470

S.	Page.
Sandy Hook	555-556
Sandy Hook Bay	556
Sandy Hook Light-house	555-556, 594
Sandy Hook Light-vessel	554
Sandy Hook Point	556
Sandy Neck	68
Sandy Neck Flats	69-70
Sandy Neck Light-house	68, 71
Sandy Point:	
(Block Island,) 305; (Fisher's Island Sound,) 310, 337; (Hammonasset River,) 434; (New Haven Harbor,) 446; (Potowomut Neck,) 292; (Sakonnet River,) 245.	
Sandy Point Flats	338
Sandy Point Reef	374-375
Sandy Point Shoal, (Greenwich Bay)	292
Sankaty Head	82
Sankaty Head Light-house	82, 185
Sapowet Creek	245
Sapowet Point	245
Saquish Head	62
Saquish Head Rock	64
Saquish Neck	62
Saquish Point Shoal	64
Sarah's Ledge	412
Sasco Creek	361, 465
Sassafras Point	259
Sassafras Point Light-house	259, 303
Sassamore Rock	289
Sauga Point	288
Saugatuck River	361, 466
Saugerties, Village of	605
Saugerties Light-house	605, 620
Saugerties Point	604
Saul's Point	350
Saul's Rock	484
Savin Hill	44
Savin Point	44
Savin Rock	446
Savin or Cove Rock Ledge	446
Saxton's Island	551
Saybrook, Village of	349, 426
Saybrook Bar	377, 390, 428
Saybrook Beacon	428
Saybrook Light-house	349, 426, 429
Saybrook Point	349, 426
Scaly Rock	521
Scarborough, Village of	597
Schermerhorn Dike	608
Schermerhorn Island	608
Schermerhorn Island, Little	608
Schermerhorn Island Flats	608, 615
Schodack, Village of	607
Schodack Channel Dike	607
Schodack Channel Light	607, 620
Schodack Creek	607
Schodack Island	607
Schodack Island, Little	607
Schodack Island, Lower	607
Schodack Island, Upper	607
Schoolship Rock	168
Schooner Bar	81
Schrucher's Island	311
Schulz' Landing	603
Schuyler, Fort	369, 515, 518
Schuyler's Ledge	246
Schuylerville, Village of	374, 515
Scituate, Village of	58
Scituate Harbor	58-59
Scituate or Cedar Point	58
Scituate Tower	36, 58
Scoticut Neck	190, 205-206
Scoticut Point	190, 205-206
Scorton Neck	68
Scotch Cap, The, (off Bradford's Cove)	367, 395, 447
Scotch Caps, The, (off Hye Neck)	372, 500
Scotch Cove	370, 473
Scotland Light-vessel	556
Scraggy Neck	186
Scudder Rock	70
Sculpin Ledge	41, 43, 49
Sculpin Ledge Channel	41, 43
Scusset Beach	68

S.	Page.	S.	Page.
Seabright, Village of	555	Sippican Harbor	191-192, 229-232
Seatuck, Village of	551	Sippican Neck	192, 229
Sea-Flower Reef	320, 342-343, 344, 416	Sippican Point	192, 229
Sea-Flower Reef Beacon	320	Sisters, The, (Narragansett Bay)	265, 261, 283
Seal Ledge, (Cataumet)	236	Skiff Island	120
Seal Rock:		Skiff Shoal	120, 121
(Off Hope Island,) 271; (Narragansett Bay Approaches,) 259, 279; (Neponset River,) 46.		Slate Island	51
Seal Rock Flats	264	Slate Ledge	10, 23, 28-29
Seal Rocks:		Slate Wharf, The, (Hudson River)	603
(Fisher's Island Sound,) 317, 328; (Mount Hope Bay,) 302; (Sippican Harbor,) 192, 230, 231:		Sleepy Hollow	597
Seaside Park	350, 457	Sleightburgh, Village of	603
Second Pier	427	Slippe Stein Island	604
Second Thirty-seven Fathom Hole	575	Slocum's Ledge	273
Seekonk River	259	Slocum's River	186
Seguine Point	557	Slue Channel into New Bedford Harbor	218-219
Senator Shoal	94, 133, 135	Slues across Horse-Shoe Shoal	96
Setauket, Village of	464	Small Island	609
Setauket Beach	354, 463	Smalley's Bar	74
Setauket Harbor	463	Small's Shoal	98
Seventy-four Bar	8, 27	Smith's Cove:	
Sewamneck-Neck	301	(New London Harbor,) 410; (Southern Shore of Horse Neck,) 370; (Warren River,) 294.	
Seymour's Point	361, 466	Smith's Creek	588
Seymour's Rock	467	Smith's Landing	605
Shad Island	608	Smith's Point, (Great South Bay)	552
Shad or Lamp Island	607	Smith's Point, (Oyster Bay)	498
Shag Bank	450	Smith's Reef	246
Shag or Egg Rocks	2	Smith's Rock, (off Long Neck Point)	382, 474
Shagwong Point	300	Smith's Rocks	37
Shagwong Reef	404	Smithtown Bay	364, 464-465
Shank-Painter Bar	77	Smithtown Beach	364
Sheep Island	47, 51	Smithtown Harbor	364
Sheep Island Flats	52	Smoking Point	587
Sheep Island Shoals	48	Snaky Hollow	599
Sheep Point	250	Sneden's Landing	598
Sheep Head Rocks	542	Snow's Rock	927
Sheep Pen Cove	253, 271	Soldier's Home, (Ward's Island)	521
Sheffield Island	363, 469	Soundings on Long Island and Jersey Coasts	577
Sheffield Island Harbor	362, 469-473	Sound View Point	370
Shell Reef	526	South Amboy, Village of	557, 588
Sheldrake Rock	525	South Bay:	
Shelter Island	536	(Boston Harbor,) 5, 44; (Cruger's Island,) 604; (Hudson City,) 606.	
Shelter Island Sound	537-538	South Bay, Great	552
Sheppard's Ledge	37, 56, 57	South Beacon, (Scituate)	59
Sherwood's Creek	361	South Boston	5
Sherwood's or Hansford Point	361	South Boston or Dorchester Flats	5, 10, 23, 29
Sherwood's Pond	361	South Brother, The, (East River)	520
Shetucket River	408	South Brother, The, (off Four Mile River)	424
Shinnecock Bay	550-551	South Brother North Reef	524
Shinnecock Hills	551	South Brother South Reef	524
Shinnecock Inlet	550-551	South Channel:	
Shinnecock Light-house	551	(Broad Sound—Boston Bay,) 24-30; (Fisher's Island Sound,) 317, 328-330; (Long Island Sound,) 402-403; (New York Bay,) 567-569.	
Ship Rock	500, 501	South or Main Channel, (Nantucket Sound)	109-117
Shippan Point	370, 482	South Coast of Long Island	550-554
Shippan Point Shoals	483	South Cove, (near Foxes)	427
Shirley, Point	3, 19, 25	South Cove, (near Saybrook)	426
Shirley Gut	3, 19, 25, 31-33	South Dumping	313
Shoal of Brown's Bank	64	South End	357, 446
Shoal Ground north of Ram Island, (Fisher's Island Sound)	341	South Ferry, (Narragansett Bay)	270
Shoal Harbor	556	South Ferry, (New York)	527
Shoal Point, (Black Rock Harbor)	360, 458, 460, 461	South Hammock	313
Shoal Spots, The, (Nantucket Sound)	127, 130	South Hammock Shoals	329
Shoals East of Lovell's Island	39	South Hampton, Village of	550
Shooter's Island	591	South Harwich, Village of	83
Shore Rock	412	South Huntington, Village of	552
Short Beach	461	South Lyme, Village of	349
Short Beach Point	360, 461	South Norwalk, Village of	471
Shovelful Shoal	92-93, 129	South Oyster Bay	552
Shovelful Shoal or West Shovelful Shoal	106	South Oyster Bay, Village of	552
Shovelful Shoal Light-vessel	93	South River	60
Shrewsbury River	555	South Rondout, Village of	603
Shrewsbury Rocks	569	South Shore of Cape Cod Bay	72
Siasconnet	82, 184	South Shores of Buzzard's Bay	187
Sills Island	608	South Spit of Nix's Mate	43
Sing Sing, Town of	597	South Wellfleet, Village of	72
Sing Sing Prison	597	South Yarmouth, Village of	131
Single Rock:		Southeast or Black Ledge	347, 413, 416-417
(Mamaroneck River,) 501; (Sag Harbor Entrance,) 546; (Stonington Harbor,) 332; (Tarpaulin Cove,) 155.		Southeast Ledge	292
Sinker Rock	273	Southeastern Point of Scraggy Neck	237
Sippican, Village of	229		

INDEX.

XXIII

S.	Page.
Southern Passage, (Atlantic Ocean)	584
Southern Passage, (Newport Harbor)	278, 279-281
Southern Spit of East Bank	571, 572
Spald, Village of	538
Spald Bay	538
Spald Harbor	538
Spald Point, Village of, (Great Peconic Bay)	540
Spald Point, Village of, (Long Island Sound)	361, 465
Spald Point Beacon	361, 465
Spald Point Flats	543
Spald Point Harbor	361, 465-466
Spald Point Point, (Great Peconic Bay)	540
Spald Point West Beacon	458
Spald Point West Ground, The	136, 138
Southwest Ledge: (Block Island Sound,) 403-404; (Buzzard's Bay,) 197-198, 235, 236; (New Haven Entrance,) 448; (New London Entrance,) 413.	
Southwest Ledge Light-house	356, 446, 452
Southwest Point, (Prudence Island)	253
Southwest Spit	561
Sow and Pigs Reef	100-101, 185, 193, 203
Sparrow Island	302
Sparrow Island Flats	302
Sparta, Village of	597
Spectacle Island, (Long Island Sound)	357, 441
Spectacle Island, (Sakonnet River)	246
Spectacle Islands or The Spectacles, (Boston Harbor)	4, 19, 40
Spence Point	338
Spunk, Village of	551
Spindle Rock, (Centreville Harbor)	141, 142
Spindle Rock, (Edgartown Harbor)	162
Spindle or Warwick Rock	272, 291, 292
Spit or Brewster Bar	2, 7, 39
Spit Beacon	7
Spofford's Point	519
Spring Creek	69
Spring Hill Beach	68
Springfield, Town of	426
Springs, The, Village of	535
Sprite Island	362, 468
Spytten Duyvel Creek	522, 596
Squantum, Peninsula of	40, 45, 47
Squash Meadow Shoal	115, 167
Squaw Island	357, 441
Squid Ledge	374
Squidpoint Beach	124
Squidpoint Point	124
Squidpoint Ridge	125
Staatsburg, Village of	602
Staatsburg Creek	602
Stage Harbor	126, 131
Stamford, Village of	370, 482
Stamford Harbor	370, 482-486
Stamford Middle Ground	483
Starbuck Island	610
Starbuck Neck	160
Starbuck Point	85, 160
Starbuck Point Flats	162
Starr's Hill	409
Starvegoat Island	258
Starvegoat Island Flats	264
State Ledge	9, 22, 28
Staten Island	557
Staten Island Flats	562
Staten Island Sound	588
Stanton Hill	337
Steamboat Point	331
Steamboat Rock	501
Steamboat Wharf	331
Steel Works, (Wareham)	233
Stellwagen Ledge, (Boston Bay)	58
Stellwagen Ledges, (Boston Bay)	14, 36, 58
Stellwagen Rock	66
Stellwagen's Bank	44
Stepping Stones, The	369, 384, 514
Stepping Stones Light-house	369, 384, 514
Steward's Island	192, 230
Stirling, Village of	352, 537
Stirling Basin	537
Stodder's Cove	61
Stodder's Neck	61

S.	Page.
Stone Bridge Village	245
Stone Horse Rocks	66
Stone Horse Shoal, (Monomoy)	92
Stone Island, (Long Island Sound)	350, 433
Stone Island Ledge, (Long Island Sound)	350, 391, 433
Stone Island Reef, (Long Island Sound)	350, 433, 434
Stonington, Village of	311, 331, 337
Stonington Harbor	311, 331-336
Stonington Light-house	310-311, 331
Stony Beach	2
Stony Brook	364, 464
Stony Brook, Village of	364
Stony Brook Beach	364
Stony Brook Harbor	364
Stony Point: (East River,) 520; (Edgartown Harbor,) 161; (Hudson River,) 598; (near Sachem's Head Harbor,) 356.	
Stony Point, Little	599
Stony Point Flats, (Edgartown)	161
Stony Point Light-house	598, 620
Store Wharf, (Tarpanlin Cove)	88, 165
Storm King, The	599
Story's Flats	588
Story's Point	588
Stratford, Town of	359, 455
Stratford Bar	455-456
Stratford Beacon	456
Stratford Harbor	455-457
Stratford Point	359, 455
Stratford Point Light-house	359, 455, 467
Stratford Point Shoal	380, 456, 457-458
Stratford Shoal	355, 380
Stratford Shoal Light-house	355
Strattonport, Village of	520
Strawberry Hill	2, 13
Strawberry Point	12-13, 55
Strong's Neck	354, 463-464
Strong's Point	464
Studwell's Cove	491
Studwell's Point	370, 491
Sturgeon Flats	162
Sturgeon Point, (Hudson River)	602
Stuyvesant, Village of	607
Stuyvesant Landing	607
Stuyvesant Light-house	607, 620
Success Rock	383-384, 507
Succoneset Point	87
Succoneset Shoal	87, 98
Succoneset Shoal Light-vessel	87, 97-98
Sugar Loaf, The, (Long Island Sound)	365
Sugar Loaf Mountain	599
Sugar Reef	315, 323
Sugar Reef Passage	314, 322-323
Sunken Island, (Boston Harbor)	41, 49
Sunken Island Beacon	41, 49
Sunken Ledge, (Gangway Passage)	37
Sunken Ledge or Lone Rock, (Mattapoiset Harbor)	227
Sunken Ledge, (Weymouth Fore River)	49
Sunken Meadow	521
Sunken Meadow Beach	365
Sunken Meadow Creek	365, 464
Sunken Pier	132
Sunken Rocks or The Roaring Bulls	20, 25-26
Sutton Rocks	56
Swan Pond River	83
Swash Channel, (New York Bay)	565-567
Sweeper's Ground, The	319, 339, 343
Swezy's Landing	364
Swift's Flats	234
Swift's Neck	233
Sycamore Point	604
T.	
Table Rock	522
Tappan Zee or Sea	597
Tarpanlin Cove	88, 154-156
Tarpanlin Cove Light-house	88, 154, 156
Tarrytown, Town of	597
Tashua Hill	359, 455
Taunton River	302
Taunton Rock	367, 441
Tavern Island	364, 469-470

T.	Page.	T.	Page.
Tavern Island Hammock	470	The Highlands or New Paltz, Village of	601
Taft's Point	411	The Hog's Back:	
Telegraph Station of the New York Herald at Whitestone Point	519	(East River,) 525; (Hudson River,) 604; (New London Harbor,) 414.	
Telegraph Station, (Vineyard Haven)	86, 165	The Inner Minot	14
Teller's Point	597	The Iron Works, (Troy)	619
Tempe's Nob	189	The Knubble	240
Ten Feet Rip, (Nantucket Shoals)	175	The Lime Kilns, (Hudson River)	598
Terrill's Creek	538	The Lower Middle, (Boston Harbor)	8, 21-22, 27, 32
Terry's Point	352	The Lower Middle, (Wareham River)	535
Tewksbury Rock	20	The Lower Middle Ground, (Warren River)	285
Thames River	347, 408-419	The Lump, (East Channel—New York Bay)	571
Thamesville, Village of	411	The Lump, (South Channel—New York Bay)	467
Thatch-Bed Island	427	The Maelstrom, (Hudson River)	605, 614
Thatcher Island, Great	69	The Meadows, (Lloyd's Neck)	365
Thatcher Island, Little	69	The Mermaids	443
Thatcher Island Channel	69	The Middle, (Darion River)	474
The Battery, (New York City)	523, 554	The Middle Ground:	
The Beaver Tail	251, 254, 269	(Block Island Sound,) 375, 404; (Boston Harbor,) 32, 34; (Bristol Harbor,) 298, 299; (Centreville Harbor,) 140, 142; (Chatham Roads,) 127-128, 130-131; (Cuttyhunk Harbor,) 202; (East River—off Governor's Island,) 527; (East River—near Hell Gate,) 524-525; (Edgartown Harbor,) 162; (Fisher's Island Sound,) 316, 325, 332; (Hyannis Roads,) 198; (Long Island Sound,) 355, 380; (Plum Gut,) 534, 549; (Vineyard Sound,) 99, 169; (Wellfleet Harbor,) 73; (Westport Harbor,) 241.	
The Big Boil	448	The Mud Hole, (Hudson River)	600
The Bight	597	The Mud Hole, (New York Entrance)	576
The Black-bays	348, 377, 424	The Mud Holes, (New York Entrance)	574-576
The Bolgers	510, 512	The Narrows:	
The Bow Bells	197, 230	(Boston Harbor,) 3; (Duck Island Harbor,) 477; (Kickanuit River,) 301; (New York Bay,) 558; (Weymouth Back River,) 51.	
The Brick-yards	486	The Neck, (Rhode Island)	250, 254
The Bridge Port	245	The Negro Heads, (East River)	522
The Broken Land	365	The Negro Heads, (Long Island Sound)	357, 395, 442, 444
The Brothers:		The North Brother, (off Four Mile River)	424
(Off Darien River,) 474; (East River,) 520; (off Four Mile River,) 424; (Hudson River,) 599, 611; (Narragansett Bay,) 273; (Wickford Harbor,) 289.		The North Brother, (Hell Gate)	520
The Calves, (Captain's Island Harbor)	371, 496	The North Brothers, (off New Rochelle Harbor)	510
The Cement Works	603	The Oil Spot, (New York Entrance)	567, 570
The Centurion	7, 15, 42	The Old Cock	150, 240
The Chimney Corner	370	The Old Hen, (Hempstead)	367, 383, 502, 504, 507
The Chimney Sweeps	374, 511, 512	The Old Lime Kiln	601
The Chimneys	448	The Old Sow, (Long Island Sound)	354, 379
The Clumps	474	The Old Sow, (Wellfleet Harbor)	74
The Coal Bed	614	The Outer Minot	12, 14, 55
The Cove:		The Outer Thimble	356
(Barnstable Harbor,) 69; (Black Rock Harbor,) 360, 461; (Oyster Bay Harbor,) 487; (Sakonnet River,) 245.		The Palisades	526
The Cow and Calf, (off Branford Entrance)	380, 395, 44	The Pulpit	241
The Cow Yard	6	The Race	307, 346
The Cows, (Black Rock Harbor)	360, 381, 458, 460, 461	The Ridge	205
The Cows, (off Shippan Point)	370, 382, 474, 483	The Roads, (Block Island)	20, 25-26
The Crow's Nest	599	The Roaring Bulls	560-561, 566, 571
The Deacon's Seat	231	The Romer or Romer Shoal	175
The Deep Hole, (Osterville)	143	The Rose and Crown	604, 613
The Devil's Back	26	The Saddle-Bags	80, 89
The Devil's Bridge	100, 125	The Sand Bar	194, 207, 211
The Devil's Limb	26	The Sand Spit, (New Bedford Entrance)	539, 546
The Divide, (Niantic River)	420	The Sand Spit, (Shelter Island Sound)	357, 395, 447
The Dry Romer	566	The Scotch Cap, (off Bradford's Cove)	372, 500
The Dumplings, (Buzzard's Bay)	187, 205, 207	The Scotch Caps, (off Rye Neck)	127, 130
The Dumplings, (Narragansett Bay)	254, 260, 280	The Shoal Spots, (Nantucket Sound)	255, 261, 283
The Dunderberg	598	The Sisters	603
The False Handkerchief	93	The Slate Wharf	520
The Ferry, (Fall River)	301	The South Brother, (East River)	424
The Fireplace, Village of	535	The South Brother, (off Four Mile River)	136, 138
The Flats, (Hudson River)	603, 613	The Southwest Ground	4, 19, 40
The Flying Place	1	The Spectacles	345
The Fresh Kills	588	The Springs, Village of	369, 384, 514
The Frying Pan	525	The Stepping Stones	599
The Gangway, (Boston Harbor Approaches)	12, 36-39	The Storm King	365
The Glen	245	The Sugar Loaf	319, 330, 343
The Grampuses	38, 56	The Sweeper's Ground	6, 14
The Graves	5-6, 10-20, 25	The Thieves	356
The Great Kills	557	The Thimble	356
The Great Marshes	69	The Thimbles	350, 457
The Gridiron	526	The Tongue	365
The Gut	467	The Turn-up, (Block Island)	373, 511
The Hammock	521	The Twins	8, 22-23, 25
The Handkerchief	93, 126-127, 128, 132	The Upper Middle, (Boston Harbor)	8, 22-23, 25
The Hardings	6-7, 14	The Upper Middle, (Wareham River)	286
The Harrow Teeth	468	The Upper Middle Ground, (Warren River)	286
The Hedge Fence	108, 114-115		
The Hen and Chicken, (East River)	522, 526		
The Hen and Chickens:			
Buzzard's Bay Entrance,) 185, 193, 240; (Hudson River,) 602, 612; (Long Island Sound,) 390.			
The Highlands, (Hudson River)	598		
The Highlands of Navesink	554		

T.	Page.
The Upper Overslaugh.....	609, 615
The West Hook.....	363, 469
The World's End, (Hingham Bay).....	51
The World's End, (Hudson River).....	599
The Young Cocks.....	193
Thieves' Ledge or The Thieves.....	6, 14
Thimble, The.....	356
Thimbles, The.....	356
Thimbles Channel.....	394-396, 397-398
Thirty-eight Fathom Hole.....	575
Thirty-five Fathom Hole.....	575
Thirty-seven Fathom Hole, First.....	575-576
Thirty-seven Fathom Hole, Second.....	575
Thirty-two Fathom Hole.....	576
Thirty-two Fathom Hole, Inner.....	576
Thomson's Island.....	4, 40
Thompson's Island Flats.....	41
Thompson's Island Shoals.....	45
Thorburn's Dock.....	522
Three Feet Rock.....	422
Three Mile Harbor.....	535
Three Mile Harbor Creek.....	535
Throg's Neck.....	369, 515, 518
Throg's Neck Light-house.....	369, 515, 518, 533
Throg's Neck Shoal.....	384, 514, 523
Thurber's Creek.....	552
Tidal Currents on South Coast of Long Island.....	583
Tides:	
Albany, 620;—	
Barnstable Harbor, 71; Bass River Roads, 134;	
Beaver Tail Light-house, 304; Bird Island Light-house, 239;	
Black Rock Harbor, 463; Block Island Basin, 305; Boston	
Harbor, 53; Bridgeport Harbor, 463; Bristol Harbor, 301;	
Buzzard's Bay, 239;—	
Castleton, 620; Centreville Harbor, 143;	
Connecticut River Entrance, 429;—	
Dobbs' Ferry, 620; Dump-	
ling Rocks, 239; Dutch Island Harbor, 287;—	
East River,	
533; Edgartown Harbor, 164;—	
Fall River, 303;—	
Governor's	
Island, (New York,) 533, 594, 620; Great Captain's Island	
Harbor, 497; Great Point, 184; Greenwich Bay, 294;—	
Hall	
Gate Ferry, (East River,) 533; Hingham Harbor, 53; Holmes'	
Hole, 170; Hudson River, 620; Huntington Bay, 482; Hyannis	
Roads, 139;—	
Lloyd's Harbor, 482;—	
Manhasset Bay, 508; Mat-	
tapsot Harbor, 229; Monomoy, 184; Mount Hope Bay, 303;—	
Nantucket Harbor, 159; Nantucket Shoals, 184; Narragansett	
Bay, 304; Nauset Beach, 81; New Bedford Harbor, 225; New	
Haven Harbor, 452; New London Harbor, 419; New Rochelle	
Harbor, 513; New York Bay and Harbor, 594; Newport Har-	
bor, 284, 304;—	
Oyster Bay, 490;—	
Plum Gut, 550; Plymouth	
Harbor, 67; Pocasset Harbor, 236; Point Judith, 304; Pot	
Cove, (East River,) 553; Poughkeepsie, 620; Providence River,	
304; Provincetown Harbor, 78;—	
Quick's Hole—North Side,	
239; Quick's Hole—South Side, 158;—	
Sandy Hook, 594;	
Scituate Harbor, 59; Sheffield Island Harbor, 473; Siascon-	
sett, 184; Sippican Harbor, 232; Stage Harbor, 131; Stoning-	
ton Harbor, 386; Stuyvesant, 620;—	
Tarpaulin Cove, 156; Tar-	
rytown, 620; Throg's Neck, 516, 533; Tivoli, 620;—	
Ver-	
planck's Point, 620; Vineyard Haven, 170;—	
Warren River,	
296; Wellfleet Harbor, 75; West Point, 620; Weymouth	
Fore River, 50; Wickford Harbor, 291; Wood's Hole—North	
Side, 239; Wood's Hole—South Side, 154.	
Tilston's Flats.....	46
Tilston's Point.....	45
Tiverton Neck.....	245
Tivoli, Village of.....	604
Tobacco-lot Bay.....	306
Tobey Island.....	189-190

T.	Page.
Tobias' Rock.....	37
Todd's Point.....	490
Toddy Rocks.....	7, 15, 42
Tod's Rock.....	484
Toguang Hills.....	337
Tom Never's Head.....	82
Tompkinsville, Village of.....	558
Tom's Shoal.....	120
Tongue, The.....	359, 457
Tongue Rock.....	70
Tonset, Village of.....	80
Tortoise Rock.....	448
Tottenville, Village of.....	557, 587
Tower Rock.....	8
Town Cove.....	80
Town Island.....	69
Town River.....	48
Town River Bay.....	48
Townsend's Lodge.....	379, 396, 448
Trading Cove.....	411
Tracey's Ledge.....	282, 283
Transport Rock.....	383, 499
Trap Cliff.....	604
Tree Hammock.....	363, 470
Triangle Rock.....	70
Troy, City of.....	610
Truman's Beach.....	352, 537
Tubby Hook.....	596
Tuckernuck Bank.....	105, 111
Tuckernuck Island.....	82
Tuckernuck Shoal.....	105, 111-112
Tuck's Island.....	351
Tuff's Point.....	588
Tupper Island.....	69
Turkey Point.....	604
Turn-up, The, (Block Island).....	305
Turtle Cove.....	257
Tuthill's Landing.....	354
Tweed's Island.....	370
Tweed's or Fincho's Island Rocks.....	493-494
Twelve Feet Rock, (Boston Harbor).....	21, 26
Twelve Feet Shoal, (Monomoy Shoals).....	103, 110
Twelve Feet Shoal, (Nantucket Shoals).....	175
Twenty-eight Fathom Hole.....	576
Twenty Fathom Line.....	576-577
Twenty-one Fathom Hole.....	578
Twenty-one Feet Shoal.....	574
Twenty-three Fathom Hole.....	576
Twins, The.....	373, 511
Two Mile Rocks.....	241
Two Tree Island.....	348
Two Tree Island Channel.....	420-422
Two Tree Island Shoal.....	421
Tyler's Point.....	604

U.

Uncas Hill.....	411
Uncasville, Village of.....	410
Uncatena Island.....	187
Union Bridge, (North River—Massachusetts).....	60
Union Wharf, (Wellfleet Harbor).....	73
United States Arsenal, (Watervliet).....	609
United States Cob Dock.....	523
United States Magazine, (Ellis' Island).....	559
United States Military Academy, (West Point).....	599
United States Naval Torpedo Station, (Newport Harbor).....	254, 278
United States Navy Yard, (Charlestown).....	5
Upper Aquebogue, Village of.....	540
Upper Bay of New York.....	559
Upper Fish House Bar.....	610
Upper Flats.....	605, 614
Upper Meadows Shoal.....	295
Upper Middle, The, (Boston Harbor).....	9, 22-23, 28
Upper Middle, The, (Wareham River).....	235
Upper Middle Ground, The, (Warren River).....	295
Upper Neck.....	47
Upper Overslaugh, The.....	608, 615
Upper Quarantine, (New York Bay).....	558
Upper Schodack Island.....	807
Usher's Cove.....	297
Usher's Rocks.....	299

V.	Page.
Valiant Rock	346, 375-376, 411-412
Van Buren's Kill	608
Van Buren's Rock, (Wickford Harbor)	289
Van Kull's Creek	558
Van Rensselaer Island	609
Van Wies' Dam	609
Van Wies' Dike	608
Van Wies' Point	608
Van Wies' Point Light-house	608, 620
Van Wies' Wharf	608
Vanderberg's Cove	602
Variation of the Compass:	
Acoakset River, 243; Albany, (Hudson River,) 621;—	
Barnstable Harbor, 71; Barrytown, (Hudson River,) 621; Bass River Roads, 134; Boston Harbor, 54; Bridgeport Entrance, 463; Bristol Harbor, 300, 304; Buzzard's Bay, 239;—	
Catskill, (Hudson River,) 621; Connecticut River Entrance, 429;—	
Dutch Island Harbor, 287, 304;—	
East River, 534; Edgartown Harbor, 164;—	
Gardiner's Bay, 550; Governor's Island, (New York,) 621; Greenwich Bay, 294, 304;—	
Haverstraw Bay, 621; Holmes' Hole, 170; Hudson River, 621; Huntington Bay, 482; Hyannis Roads, 139;—	
Mattapoiset Harbor, 229; Mount Hope Bay, 303, 304; Muskeget Channel, 124;—	
Nantucket Harbor, 159; Nantucket Shoals, 185; Narragansett Bay, 304; New Baltimore, (Hudson River,) 621; New Bedford Harbor, 225, 239; New Haven Harbor, 453; New London Harbor, 419; New York Bay and Harbor, 621; Newport Harbor, 284, 304;—	
Oyster Bay, 490;—	
Plymouth Harbor, 67; Pocasset Harbor, 236; Poughkeepsie, 621; Providence River, 304; Provincetown Harbor, 78;—	
Quick's Hole, 158, 239;—	
Sandy Hook, 621; Sheffield Island Harbor, 473; Sippican Harbor, 232; Stonington Harbor, 336;—	
Tarpaulin Cove, 156;—	
Vineyard Haven, 170;—	
Warren River, 296, 304; Wellfleet Harbor, 76; Westport Harbor, 243; Wickford Harbor, 291, 304; Wood's Hole, 154, 239.	
Vassar Female College	601
Verdriestege Hook	587
Verplanck's Point	608
Vial's Creek Ledge	290
Views:	
Barrytown, faces page 608; Barrytown Landing, faces page 610; Black Rock Harbor, faces page 459; Block Island—from the Eastward, faces page 304; Boston Harbor, faces page 4; Bridgeport Harbor, faces page 458;—	
Cape Cod, faces page 80; Coast from Cohasset to Scituate, faces page 4; Connecticut River, faces page 423; Coxsackie Light-house, faces page 620; Crow's Nest and Storm King, faces page 604; Cruger's Island—from near Hog's Back buoy, faces page 612; Cruger's Island—looking down, faces page 614;—	
Eastern Entrance to Long Island Sound, faces page 346; Esopus Light-house, faces page 606;—	
Fire Island Inlet, faces page 552; Fisher's Island Sound Approaches, faces page 314; Four Mile Point—looking up, faces page 618;—	
Gardiner's Bay Entrance—from the Eastward, faces page 536; Great Hill, (Buzzard's Bay,) faces page 188;—	
Haverstraw Bay—off Scarborough, faces page 596; Highland Light-house, (Cape Cod,) faces page 80; Highlands—from off Peekskill, faces page 600; Hudson River, faces pages 596-620; Hyannis Roads—Western Entrance, faces page 136;—	
Landing at Barrytown, faces page 610;—	
Main Ship Channel Approaches, (Boston Harbor,) faces page 4; Montauk Point, faces page 550;—	

Views—Cont'd.	Page.
Narragansett Bay Approaches, faces page 262; Nauset Beacons, (Cape Cod,) faces page 80; New Bedford Harbor, faces page 206; New Haven Harbor, faces page 446; New London Harbor, faces page 410; New York Harbor Approaches, faces page 554;—	
Peekskill Bay—off Verplanck's Point, faces page 598; Plum Gut Approaches, faces page 548; Providence River, faces page 252;—	
Quick's Hole—Southern Entrance, faces page 156;—	
Saugerties—looking down, faces page 616; South Channel Approaches, (Boston Harbor,) faces page 4; Storm King, faces page 604; Stratford Point, faces page 458;—	
Tempe's Nob, (Buzzard's Bay,) faces page 188;—	
Vineyard Haven, faces page 166; Vineyard Sound—Western Entrance, faces page 86;—	
West Point—from near Constitution Island, faces page 602; West Point—looking up, faces page 602.	
Vincent's Island	370
Vinegar Point	365
Vineyard Haven or Holmes' Hole	86, 164-170
Vineyard Sound	84-174
Vineyard Sound Light-vessel	100, 185-186
Virgin Rocks	585
Volant Rock	231
W.	
Waackaack Beacon	566
Waackaack Cove	566
Wading River	354
Wading River, Village of	354
Wainscott, Village of	550
Waite Island	370
Waldberg Landing	567
Walden's Island	411
Walker's Cove	297
Walker's Island	287
Wallabout Bay	523
Walnut Neck	477
Walnut Point	51
Walton's Cove	311, 331
Wamphassuck Hill	311, 331
Wamphassuck Point	335
Wamphassuck Point Reef	296
Wamsutta Mills	606
Wanton Island	600
Wappinger's Creek	87, 144
Waquoit Bay	87, 144
Waquoit Village	521
Ward's Island	557
Ward's Point, (Arthur Kill Entrance)	522
Ward's Point, (East River)	588
Ward's Point Flats	589
Ward's Point Shoal	192, 235
Wareham, Village of	233
Wareham Neck	192, 233-235
Wareham River	294
Warren, Town of	301
Warren Neck, (Mount Hope Bay)	256, 294-296
Warren River	67-68
Warren's Cove	192, 235
Warren's Point, (Wareham River)	242, 245
Warren's Point, (between Westport Harbor and Sakonnet River)	272, 291, 294, 303
Warwick Light-house	256, 272, 291
Warwick Neck	272, 291
Warwick Point	616
Warwick or Spindle Rock	404
Washington Bar	119, 121
Washington Shoal	306, 310, 337
Waeque Bluff	551
Waeque Shoal	307
Watch Hill, (Fisher's Island Sound)	314, 315, 321
Watch Hill, (South Coast of Long Island)	306, 310
Watch Hill Light-house	315, 322-323, 376
Watch Hill Passage	259
Watch Hill Point	
Watch Hill Reef	
Watchamket Cove	

INDEX.

XXVII

W.	Page.
Waterford, Village of	348
Waterford Island	422
Watervliet, Village of	609
Watervliet Arsenal	609
Watson, Captain W.—Remarks on Approaches to New York	586-587
Watson's Point	270
Watuppa Pond	240
Way's Reef	525
Webb's Hammock	470
Woodweeder Shoal	178
Woodhewen, Village of	596
Weeset, Village of	80
Weeset or Eastham Harbor	80
Weir River	51
Welch's or Cedar Point	358, 453
Welch's or Cedar Point Reef	380
Wolffleet, Village of	72
Wolffleet Harbor	72-76
Wells' Creek	69
Wells' Point or The Tongue	359, 467
Wenaumet or Wing's Neck	189
Wesqueag Cove	270
West Bank	558, 562-563
West Beach, (Long Island Sound)	354, 476
West Beach, (Northport Bay)	366
West Beach Flats, (Northport Bay)	479
West Beach Point	551
West Beacon, (Sandy Hook)	555, 594
West Bluff	364
West Camp	605
West Chop	86, 165
West Chop or Holmes' Hole Light-house	86, 165, 170
West Clump	313, 319
West Dennis, Village of	83
West Falmouth, Village of	188
West Farms, Village of	519
West Flats, (Stony Brook Harbor)	364
West Fort	366, 486
West Harbor, (Fisher's Island Sound)	313
West Harbor, (Shelter Island Sound)	539
West Harbor Flats	546
West Harwich, Village of	83
West Haven, Village of	358, 446
West Haven Flats	449
West Hoboken, Village of	596
West Hogshead Rock	38, 56
West Hook, The	363, 469
West House	313
West Island:	
(Buzzard's Bay,) 191; (Hempstead Harbor,) 367; (Sakonnet River Entrance,) 243.	
West Island Ledge	195, 219
West Island Point	195
West Knolls	562
West Landing	354
West Neck, (Huntington Bay)	366, 476, 486
West Neck, (Shelter Island Sound)	538-539
West Neck Creek	539
West Neck Harbor	539
West Neck Point, (Shelter Island Sound)	538-539
West Neck Shoal	547
West Park	601
West Point:	
(Delancey's Cove,) 504; (Fisher's Island,) 313; (Hudson River,) 599; (Quisset,) 188, 238.	
West Point Iron Foundry	599
West Point Light-house	599, 620
West Point Military Academy	599
West River	446-447
West Rock, (New Haven)	358, 446
West Sandwich, Village of	68
West Shag or West Shag Rock	38, 56
West Shore of Cape Cod Bay	67-69
West Shovelful Shoal	106
West Spindle, (Fisher's Island)	314, 316, 325
West Spit of Apple Island Flats	34
West Troy, Town of	609
West Willies	37, 57
Westbrook, Village of	350
Westbrook Harbor	350, 429-431
Westbrook River	350, 429

W.	Page.
Westchester, Town of	519
Westchester Creek	519
Westcott's Cove	370, 388, 482
Westertoe's Island	609
Westerly, Village of	337
Western Branch, (Westport Harbor)	240
Western Channel, (Bristol Harbor)	296, 299-300
Western or Brush Island Channel, (Cohasset)	55-56
Western Head	535
Western Passage, (Narragansett Bay)	268-277
Westport, Town of, (Long Island Sound,)	361, 466
Westport, Village of, (Massachusetts)	240
Westport Harbor, (Long Island Sound)	466-467
Westport Harbor, (Massachusetts)	239-243
Westport Point, Village of	240
Westport Wharf	240
West-Southwest Ledge	95, 136, 137
Wawaentic River	192, 233
Wawaentic River Flats	234
Weymouth Back River	50 51
Weymouth Fore River	47-50
Weymouth Great Hill	48
Weymouth Landing	48
Whale Rock:	
(Cuttyhunk Harbor,) 203; (Mystic River,) 339-340, 343; (Narragansett Bay,) 273, 285.	
Wharf Rock	43
Wheaton's Reef	379, 394
Wheeler's Rock	434
Whig Inlet	551
Whiskey Point	603
White Beach	409
White Head, (Cohasset Harbor)	55
White Head, (Nantasket Beach)	18
White Head Flats	52
White Rock:	
(Fisher's Island Sound,) 335, 341; (New Bedford Harbor,) 219; (New London Harbor,) 414; (Niantic Bay,) 421; (Norwalk River Entrance,) 363, 470, 472.	
White Rocks, (Wickford Harbor)	289, 290
White Rocks Beacon	289, 290
Whitehall Point	529
White's Ferry	60
White's Landing	602
Whiting's Ledge	39
Whitestone, Village of	519
Whitestone Creek	348
Whitestone Point	519
Whortleberry Island, (Long Island Sound)	373, 509
Whortleberry Island, (Providence River)	258-259
Wicketequock Hill	337
Wicketequock River	336
Wicket's Island	190
Wickford, Town of	270, 288
Wickford Harbor	270, 287-291
Wicopasset Island	310
Wicopasset Passage	314, 325-326
Wicopasset Reef	316, 324, 326, 328
Wicopasset Rock	316, 325
Wigwam Rock	422
Wilbur, Village of	603
Wild Goose Ledge	289
Wild Goose Point	270, 287
Wild Harbor	188, 237
Wilkes' Ledge	194, 206-207, 211
Willet's Cove	519
Willet's Point, (East River)	369, 514, 519
Willow Point	338
Wilson's Beacon	556, 594
Wilson's Creek	470
Wilson's Point, (Norwalk)	362, 470
Wilson's Rock	41, 43
Winant's Kill	610
Windmill Hill	244
Windmill Point, (Boston Bay)	11, 47
Windmill Point, (Stonington)	310, 331, 337
Windward Passage	661
Wing's Cove	192
Wing's Cove Flats	234
Wing's Neck Light-house	189, 236, 230
Wing's or Wenaumet Neck	180

W.	Page.
Winkle or Gardiner's Point	477
Winnie's Bar	608
Winnie's Point	608
Winthrop's Bar	31-32
Winthrop's Cove	409
Winthrop's Head	19, 25
Winthrop's Hill, (Fisher's Island Sound)	312
Winthrop's House, (Fisher's Island Sound)	312, 329
Winthrop's Point	409
Woepecket Island	196
Woepecket Rock	149, 152, 196
Wood Beach	72
Wood End	76
Wood End Light-house	76, 78
Woodbridge Creek	588
Woodbridge Neck, Village of	588
Woodhull's Landing	354
Wood's Castle	244
Wood's Hole	87-88, 144-154, 187
Wood's Point	46
Wood's Point Flats	46
Woolsey's Bath House	532

W.	Page.
Woolsey's Dock	525
Woolsey's Ledge	525
Woolsey's Rock	484
Woolsey's Rock Shoal	484
Wooster, Fort	447
World's End, The, (Hingham Bay)	51
World's End, The, (Hudson River)	599
Wreck Rock	50
Wreck Shoal	97

Y.	Page.
Yantic River	408
Yarmouth, Village of	68
Yarmouth Flats	69
Yarmouth Port, Village of	68
Yellow Bank	160
Yerle's Clip	605
Yonkers, Town of	696
Young Cocks, The	193
Young's Hill	409
Young's Point	537
Young's Rock	317, 328