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1960

U.S. DEPARTMENT OF COMMERCE
Frederick H. Mueller, *Secretary*
COAST AND GEODETIC SURVEY
H. Arnold Karo, *Director*
March 26, 1960

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UNITED STATES COAST PILOT 1

ATLANTIC COAST

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Eastport to Cape Cod

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Sixth (1960) Edition

United States Government Printing Office, Washington : 1960

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National Oceanic and Atmospheric Administration

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Preface

This sixth edition of United States Coast Pilot 1, Atlantic Coast, Eastport to Cape Cod, is based on the work of the Coast and Geodetic Survey and includes the results of Coast Pilot field inspection made in 1958–59. Much information also has been obtained from the Weather Bureau, the Corps of Engineers, the Coast Guard, and from local authorities.

This edition is corrected through Notice to Mariners 13 of March 26, 1960, and cancels the 1950 edition of Coast Pilot 1, Atlantic Coast, Section A, St. Croix River to Cape Cod.

Supplements to this Coast Pilot, containing changes from various sources, usually are issued early each year. Each supplement is complete in itself and cancels all previous issues. The latest supplement, together with Notices to Mariners subsequent to it, will correct the book to date. Supplements may be obtained from the Coast and Geodetic Survey or its sales agents.

Mariners and other interested parties are requested to send to the Director, Coast and Geodetic Survey, U.S. Department of Commerce, Washington 25, D.C., any information affecting this Coast Pilot that may come to their attention.

H. Arnold Karo, *Director.*

March 26, 1960.

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1. GENERAL INFORMATION

EXPLANATORY.—The **Coast Pilots** of the Coast and Geodetic Survey are a series of nautical books containing a wide variety of information important to the navigator of U.S. coastal waters. Most of this information cannot be shown conveniently on the standard nautical charts and is not readily available elsewhere. Subjects include landmarks, navigation regulations, channels, anchorages, dangers, weather, ice, routes, pilotage, and port facilities. A new edition of a Coast Pilot is published about every 7 years although the interval may vary from 5 to 12 years depending on the importance of the region, the field inspection, and other factors.

Supplements.—Coast Pilot Supplements, containing changes reported to C&GS from date of edition through date of Supplement, usually are published early each year. Each Supplement is complete in itself and cancels all previous issues. Supplements should be kept intact; numbered-line continuity with editions provides sufficient reference without cutting and pasting. The latest Supplement may be obtained without charge from the Coast and Geodetic Survey, U.S. Department of Commerce, Washington 25, D.C., or from C&GS sales agents.

Bearings.—These are true, and when given in degrees are clockwise from 000° (north) to 359°. Light-sector bearings are toward the light.

Bridges and cables.—Clearances of bridges and overhead cables are in feet above normal high water unless otherwise stated; clearances of drawbridges are for the closed position. These are the vertical clearances approved for charting by C&GS Nautical Chart Branch. They may be as-built, authorized, or reported; see latest prints of charts for possible modifier. Also see charts for horizontal clearances of bridges; these are repeated in the Coast Pilots only in unusual cases.

Courses.—These are true and are given in degrees clockwise from 000° (north) to 359°. The courses given are the courses to be made good.

Currents.—Directions are the true directions toward which the currents set. Velocities are in knots, which are nautical miles per hour.

Depth units.—Depths are in fathoms or feet below the low-water tidal datum of the charts unless otherwise stated.

Distances.—These are in nautical miles unless otherwise stated. A nautical mile is 1 minute of latitude, or approximately 2,000 yards, and is about 1.15 statute miles.

Elevations.—These are in feet above the plane of reference used for that purpose on the charts.

Light and fog-signal characteristics.—These are not described and light sectors are not usually defined. The Coast Guard Light Lists should be consulted for complete information.

Radio navigational aids and radio weather aids.—These are not fully described. Coast Guard Light Lists and H.O. Publications 205 and 206 should be consulted.

Winds.—Directions are the true directions from which the winds blow. Velocities are in knots, which are nautical miles per hour.

The **COAST AND GEODETIC SURVEY** is charged with (1) the survey of the coasts of the United States and its possessions to insure the safe navigation of coastal and intracoastal waters; (2) the compilation and publication of **nautical charts, Coast Pilots, tables of predicted tides and currents, and tidal current charts** to meet the needs of the mariner; (3) the determination of geographical positions and elevations in the interior of the country to coordinate the coastal surveys and provide a framework for mapping and other engineering work; (4) the compilation and publication of aeronautical charts for use in air navigation; (5) observations of the earth's magnetism in all parts of the country to furnish magnetic information essential to the mariner, aviator, land surveyor, radio engineer, and others; and (6) seismological observations and investigations to supply earthquake data required in designing structures.

District Offices of the Coast and Geodetic Survey are located at some of the principal ports in the United States; see Appendix. Files of charts, Coast Pilots, and other publications are maintained at these offices for the use of mariners, who are invited to avail themselves of the facilities afforded.

Sales agents for Charts, Coast Pilots, Tide Tables, Tidal Current Tables, and Tidal Current Charts of the Coast and Geodetic Survey are located in many ports of the United States and in some foreign ports. See Appendix for list of sales agents. The charts and books also may be purchased from the Washington Office or from the District Offices. Orders mailed to Washington, D.C., should be accompanied by check or money order, made payable to C&GS, Department of Commerce. Indexes of charts and books will be furnished free, upon receipt of request designating areas of interest.

Special signals for surveying vessels.—Pilot Rules for Inland Waters, § 80.33, state that by day a surveying vessel of the Coast and Geodetic Survey, underway and employed in hydrographic surveying, may carry in a vertical line, one over the other not less than 6 feet apart where they can best be seen, three shapes not less than 2 feet in diameter of which the highest and lowest shall

be globular in shape and green in color and the middle one diamond in shape and white.

(a) Vessels of the Coast and Geodetic Survey shall carry the above-prescribed marks while actually engaged in hydrographic surveying and underway, including drag work. Launches and other boats shall carry the prescribed marks when necessary.

(b) It must be distinctly understood that these special signals serve only to indicate the nature of the work upon which the vessel is engaged and in no way give the surveying vessel the right-of-way over other vessels or obviate the necessity for a strict observance of the rules for preventing collisions of vessels.

(c) By night a surveying vessel of the Coast and Geodetic Survey, underway and employed in hydrographic surveying, shall carry the regular lights prescribed by the rules of the road.

(d) A vessel of the Coast and Geodetic Survey, when at anchor in a fairway on surveying operations, shall display from the mast during the daytime two black balls in a vertical line and 6 feet apart. At night two red lights shall be displayed in the same manner. In the case of a small vessel the distance between the balls and between the lights may be reduced to 3 feet if necessary.

(e) Such vessels, when at anchor in a fairway on surveying operations, shall have at hand and show, if necessary, in order to attract attention, a flare-up light in addition to the lights which are, by this section, required to be carried.

International Rules of the Road, Part B, Rule 4(c), states that a vessel engaged in laying or in picking up a submarine cable or navigation mark, or a vessel engaged in surveying or underwater operations when from the nature of her work she is unable to get out of the way of approaching vessels, shall carry, in lieu of the lights specified in Rule 2(a) (i) and (ii), three lights in a vertical line one over the other not less than 6 feet apart. The highest and lowest of these lights shall be red, and the middle light shall be white, and they shall be of such a character as to be visible all round the horizon at a distance of at least 2 miles. By day, she shall carry in a vertical line one over the other not less than 6 feet apart, where they can best be seen, three shapes each not less than 2 feet in diameter, of which the highest and lowest shall be globular in shape and red in colour, and the middle one diamond in shape and white.

The **wire drags** used by the Coast and Geodetic Survey in sweeping for dangers to navigation may be crossed by vessels without danger of fouling at any point except between the towing launches and the large buoys near them, where the towline approaches the surface of the water. Vessels passing over the drag are requested to change course so as to cross it approximately at right angles, as a diagonal course may cause the propeller to foul the supporting buoys and attached wires. No attempt should be made to pass between the drag launches while the wire is being set out or taken in, unless it would endanger a vessel to do otherwise, because the bottom wire is slack and the floats at each 100-foot section may lift it nearly to the surface; at this time the launches usually are headed directly toward or away from each other and the operation may be clearly seen.

Nautical charts are published primarily for the use of the mariner but serve the public interest in many other ways. They are compiled principally from Coast and Geodetic Survey basic field surveys, supplemented by data from other Government organizations.

The **scales of nautical charts** range from 1:2,500 to about 1:5,000,000. Graphic scales are generally shown on charts with scales of 1:80,000 or larger, and numerical scales are given on smaller-scale charts. Coast and Geodetic Survey charts are classified according to scale as follows:

Sailing charts, scales 1:600,000 and smaller, are for use in fixing the mariner's position as he approaches the coast from the open ocean, or for sailing between distant coastwise ports. On such charts the shoreline and topography are generalized and only offshore soundings, the principal lights, outer buoys, and landmarks visible at considerable distances are shown.

General charts, scales 1:100,000 to 1:600,000, are for coastwise navigation outside of outlying reefs and shoals.

Coast charts, scales 1:50,000 to 1:100,000, are for inshore navigation leading to bays and harbors of considerable width, and for navigating large inland waterways.

Harbor charts, scales larger than 1:50,000, are for harbors, anchorage areas, and the smaller waterways.

Intracoastal Waterway charts, scale 1:40,000, are a special series covering the New Jersy inside route, the Atlantic Coast inside route from Norfolk, Virginia, to Key West, Florida, and the Gulf Coast inside route from Carrabelle, Florida, to Port Brownsville, Texas.

Mariners are urged to obtain and use the largest-scale chart available for the area to be navigated.

The **date of a chart** is of vital importance to the navigator. When charted information becomes obsolete, further use of the chart for navigation may be dangerous. Up-to-date charts should be obtained at regular intervals.

A **new edition** of a chart is printed only when corrections are so extensive or of such importance to navigation as to necessitate a replacement of all previous issues; the number and date of the current edition are printed in the lower left corner. When the edition is revised, the date of the **latest revision** is printed to the right of the edition date. Before a chart is issued by the Coast and Geodetic Survey it is corrected by hand for all important information published in the weekly Notice to Mariners since the date of printing; the number and date of the last Notice to Mariners used are **stamped** in the lower right corner. Purchasers of charts should consult the Notice to Mariners for corrections subsequent to the stamped date.

The **Mercator projection** used on most nautical charts has straight-line meridians and parallels that intersect at right angles. On any particular chart the distances between meridians are equal throughout, but distances between parallels increase progressively from the equator toward the poles, so that a straight line between any two

points is a rhumb line. This unique property of the Mercator projection is one of the main reasons why it is preferred by the mariner.

Echo soundings.—Most of the various types of echo sounder are calibrated for a velocity of sound in water of 800 fathoms per second, but the actual velocity may differ from the calibrated value by as much as 5 percent, depending upon the temperature and salinity of the waters in which the vessel is operating; the highest velocities are found in warm, highly saline water, and the lowest in icy, fresh water. Variation in line voltage can also cause errors of 10 percent or more in reading. Echoes can be obtained from schools of fish; in fact, trawlers are using the sounders for that purpose. The most serious error commonly occurs where the depth is greater than the scale range of the instrument; a 400-fathom scale indicates 15 fathoms visually and graphically when the depth is 415 fathoms. Where possible, wide variations from charted depths should be checked by wire soundings.

The **plane of reference** for depths on C&GS charts is the mean of all low waters for the Atlantic coast of the United States, including the West Indies, and the mean of the lower low waters for the Pacific coast, including the Hawaiian Islands and Alaska. The plane most frequently used on foreign charts is mean low water springs. The effect of strong winds, in combination with the regular tidal action, may at times cause the water level to fall considerably below the reference plane.

Compass roses on charts.—The annual change in variation gradually introduces an error in the magnetic compass roses on charts. The compass roses are replotted for every new edition of the chart if the error is appreciable; and the amount and date of the variation and the amount of annual change are stated for each compass rose. On some of the sailing and general charts the magnetic variation is shown by isogonic lines.

Deviation of the compass.—The magnetic effect of the ship itself combines with any instrumental error of the compass to cause the deviation, which varies with the heading of the ship and with the magnetic latitude. It is customary to counteract the deviation as far as possible with soft iron and permanent magnets, suitably placed in or on the binnacle.

Local magnetic disturbance.—The charts show areas where the compass is disturbed by magnetic masses external to the ship. Such disturbances are fairly common in shallow waters but are never encountered over oceanic depths. Magnetic force diminishes so rapidly with distance that a magnetic center on land would have to be of unprecedented intensity to affect the compass of a vessel 0.5 miles from shore.

Overhead cables are shown on the charts and described in the Coast Pilots; the clearances given are for the lowest wires at high water. Vessels with masts, stacks, booms, or aerials should allow for an additional clearance under power cables equal to the distance between adjacent cables.

Submarine cable areas are shown on the charts but are not described in the Coast Pilots. Special effort should be made to avoid anchoring or trawling in cable areas. If a vessel does foul a cable, extreme care should be used when attempting to clear. Should normal methods fail, the anchor or other gear should be slipped and abandoned rather than risk breaking or cutting the cable. The high voltages in certain cables could cause severe burns or loss of life.

Tide Tables are issued annually by the Coast and Geodetic Survey in advance of the year for which they are prepared. These tables include predicted times and heights of high and low waters for every day in the year for a number of reference stations and differences for obtaining similar predictions for numerous other places. They also include other useful information such as a method for obtaining heights of tide at any time, local civil time of sunrise and sunset for various latitudes, reduction of local civil time to standard time, and time of moonrise and moonset for various ports.

Caution.—In using the Tide Tables, slack water should not be confused with high or low water. For ocean stations there is usually little difference between the time of high or low water and the beginning of ebb or flood currents; but for places in narrow channels, land-locked harbors, or on tidal rivers, the time of slack current may differ by several hours from the time of high or low water. The relation of the times of high or low water to the turning of the current depends upon a number of factors, so that no simple general rule can be given. To obtain the times of slack water, reference should be made to the Tidal Current Tables.

Tidal Current Tables for the coasts of the United States are issued annually by the Coast and Geodetic Survey in advance of the year for which they are prepared. These tables include daily predictions of the times of slack water and the times and velocities of strength of flood and ebb currents for a number of waterways, together with differences for obtaining predictions for numerous other places. Also included is other useful information such as a method for obtaining the velocity of current at any time, duration of slack, coastal tidal currents, wind currents, combination of currents, and current diagrams. Some information on the Gulf Stream is included in the tables for the Atlantic coast.

Tidal Current Charts are published by the Coast and Geodetic Survey for various localities. These charts depict the direction and velocity of the current for each hour of the tidal cycle. They present a comprehensive view of the tidal current movement in the respective waterways as a whole and when used with the proper current tables or tide tables supply a means for readily determining for any time the direction and velocity of the current at various localities throughout the areas covered.

The **COAST GUARD** has among its duties (1) enforcement of the laws of the United States on the high seas, in harbors, bays, sounds, roadsteads, and other like bodies of water along the coasts of the United States, its territories and possessions; (2) enforcement of navigation laws, neutrality laws and regulations, rules and regulations in relation to anchorage grounds, and the Oil

Pollution Act; (3) inspection of vessels of the Merchant Marine to insure safety to passengers and crews; (4) aid to distressed mariners and saving of life and property from shipwreck; (5) issuance of Merchant Mariner licenses and documents; (6) investigation of marine casualties and accidents and suspension and revocation proceedings; (7) destruction of derelicts; (8) construction, operation, maintenance, and inspection of aids to navigation; (9) publication of Lists of Lights and Other Marine Aids and Local Notices to Mariners; and (10) maintenance and operation of ice breaking facilities.

Lists of Lights and Other Marine Aids.—Aids to navigation, consisting of lights, radiobeacons, fog signals, buoys, lightships, and daybeacons, are described in the Lists of Lights and Other Marine Aids (commonly referred to as Light Lists), which are for sale by the Superintendent of Documents, Government Printing Office, Washington 25, D.C., and by various sales agents in the principal seaports. Mariners should refer to these publications for detailed information regarding the characteristic, candlepower, and visibility of lights, as well as descriptions of light structures, lightships, daybeacons, buoys, radiobeacons, and fog signals.

Local Notices to Mariners.—Changes and deficiencies in aids to navigation maintained by or under the authority of the Coast Guard are published in Local Notices to Mariners issued by the District Commander of the area in which the aids are located. The local notices are intended for local navigation interests operating within the limits of a Coast Guard district. Changes in aids to navigation of the United States are also contained in the Weekly Notice to Mariners, Part I (Western Hemisphere Edition), prepared jointly by the U.S. Coast Guard and the U.S. Navy Hydrographic Office. The weekly notices are intended for mariners and others who have a definite need for them in connection with extended seagoing activities or those operating in several Coast Guard districts.

Reporting of defects in aids to navigation.—Promptly notify the nearest Coast Guard District Commander if an aid to navigation is observed to be missing, sunk, capsized, out of position, damaged, extinguished, or showing improper characteristics.

Radio messages should be prefixed "Coast Guard" and transmitted directly to one of the U.S. Government shore radio stations listed under "Communication" in Section 400B of Radio Navigational Aids (HO-205) for relay to the Coast Guard District Commander. If the radio call sign of the nearest U.S. Government radio shore station is not known, radiotelegraph communication may be established by the use of the general call "NCG" on the frequency of 500 kc. Merchant ships may send messages relating to defects noted in aids to navigation through commercial facilities only when they are unable to contact a U.S. Government shore radio station. Charges for these messages will be accepted "collect" by the Coast Guard.

Lights.—The distances at which lights may be seen in clear weather, given in the Light Lists and on the charts, are the geographic ranges computed in nautical miles for a height of the observer's eye of 15 feet above sea level, unless the lights are not of sufficient candlepower to be seen to the limit of their geographic range, in which case the luminous range is given. These distances may at times be increased by abnormal atmospheric refraction and may be greatly decreased by unfavorable weather conditions, such as fog, rain, haze, or smoke. All except the most powerful lights are easily obscured by such conditions. In some conditions of the atmosphere white lights may have a reddish hue.

Navigational lights should be used with caution because of the following conditions that may exist:

A light may be extinguished and the fact not reported to the Coast Guard for correction, or a light may be located in an isolated area where it will take time to correct.

In regions where ice conditions prevail the lantern panes of unattended lights may become covered with ice or snow, which will greatly reduce the visibility and may also cause colored lights to appear white.

Brilliant shore lights used for advertising and other purposes, particularly those in densely populated areas, make it difficult to identify a navigational light.

At short distances flashing lights may show a faint continuous light between flashes.

The distance of an observer from a light cannot be estimated by its apparent intensity. The characteristic of lights in an area should always be checked in order that powerful lights visible in the distance will not be mistaken for nearby lights showing similar characteristics at low intensity such as those on lighted buoys.

The apparent characteristic of a complex light may change with the distance of the observer. The characteristic as charted and shown in the light list may not be recognized until nearer the light.

Motion of a vessel in a heavy sea may cause a light to alternately appear and disappear, and thus give a false characteristic.

Where lights have different colored sectors be guided by the correct bearing of the light; do not rely on being able to accurately observe the point at which the color changes. On either side of the line of demarcation of colored sectors there is always a small arc of uncertain color.

Arcs drawn on charts around a light show the bearings between which the variation of visibility or obscuration occurs and do not indicate the distance at which it can be seen. On some bearings the distance may be reduced or increased by land or other obstructions, depending on the distance from the light.

Lights should not be passed close aboard because in many cases rip-rap mounds are maintained to protect the structures against ice damage and scouring action.

Fog signals.—Caution should be exercised in the use of sound fog signals for navigation purposes. They should be considered solely as warning devices.

Sound travels through the air in a variable manner with or without the effects of wind and, therefore, the hearing of fog signals cannot be implicitly relied upon. Experience indicates that distances must not be judged only by the intensity of the sound; that occasionally there may be areas close to a fog signal in which it is

not heard; and that fog may exist not far from a station, yet not be seen from it, so the signal may not be operating. It is not always possible to start a fog signal immediately when fog is observed.

Lightships.—Courses should invariably be set to pass lightships with sufficient clearance to avoid the possibility of collision from errors of observation, current and wind effects, other vessels in the vicinity, defect in steering apparatus, and from other causes. Experience shows that lightships cannot be safely used as leading marks to be passed close aboard, but should always be left broad off the course, whenever searoom permits.

During extremely heavy weather and due to their exposed locations, lightships may be carried off station without the knowledge and despite the best efforts of their crews. A lightship known to be off station will secure her light, fog signal, and radiobeacon and fly the International Code signal "PC" signifying "Lightship is not at anchor on her station."

Station (watch) buoys are sometimes moored near lightships to mark the approximate station should the lightship be carried away or temporarily removed. Since these buoys are always unlighted and, in some cases, moored as much as a mile from the lightship, the danger of a closely-passing vessel colliding with them is always present, particularly so during darkness or periods of reduced visibility.

Buoys.—The navigator should check his position by shore bearings, soundings, or other means, and not rely entirely on a buoy being on its charted position and showing its proper characteristic. Buoys are liable to be carried away, shifted, capsized, or sunk as a result of storms, ice conditions, collision, or other accident. Lighted buoys may become extinguished or show improper characteristics, or sound buoys may not function because of storm, ice, or collision.

Buoys may not always properly mark shoals or other obstructions due to shifting shoals and storms. Buoys marking wrecks or other obstructions are usually placed on the seaward or channelward side and not directly over a wreck. Since buoys may be located some distance from a wreck they are intended to mark because of local conditions, and since sunken wrecks are not always static, extreme caution should be exercised when operating in the vicinity of such buoys.

Radiobeacons.—A list and descriptive details of all marine radiobeacons are given in the Light Lists and H.O. Publication No. 205, Radio Navigational Aids. There is included in these publications the procedure to follow for the use of radiobeacons for calibration of radio direction-finders as well as a list of special radio direction-finder calibration stations. Also included is the procedure for distance finding from the radiobeacon stations where the radiobeacons and sound signals are sychronized for that purpose.

A vessel steering a course for a radiobeacon should observe the same precautions as when steering for a light or any other mark. If the radiobeacon is aboard a lightship, particular care should be exercised to avoid the possibility of collision, and sole reliance should never be placed on sighting the lightship or hearing its fog signal. If there are no dependable means by which the vessel's position may be fixed and the course changed well before reaching the lightship, a course should be selected that will insure passing the lightship at a distance, rather than close aboard, and repeated bearings of the radiobeacon should show an increasing change in the same direction.

Radio bearings.—No exact data can be given as to the accuracy to be expected in radio bearings taken by a ship, since the accuracy depends to a large extent upon the skill of the ship's operator, the condition of the ship's equipment, and the accuracy of the ship's calibration curve. Mariners are urged to obtain this information for themselves by taking frequent radio bearings, when their ship's position is accurately known, and recording the results. Bearings of aircraft ranges and standard broadcast stations should be used with particular caution due to coastal refraction and lack of calibration of their frequencies.

Conversion of radio bearings to Mercator bearings.—The increasing use of radio directional bearings for locations of ships' positions at sea, especially during foggy weather, has made it particularly desirable to be able to apply these radio bearings directly to the nautical chart. These radio bearings are the bearings of the great circles passing through the radio stations and the ship, and, unless in the plane of the Equator or a meridian, would be represented on a Mercator chart as curved lines. Obviously it is impracticable for a navigator to plot such lines on a Mercator chart, so it is necessary to apply a correction to a radio bearing to convert it into a Mercator bearing, that is, the bearing of a straight line on a Mercator chart laid off from the sending station and passing through the receiving station.

A table of corrections is given in the Appendix for the conversion of a radio bearing into a Mercator bearing. It is sufficiently accurate for practical purposes for distances up to 1,000 miles.

The only data required are the latitudes and longitudes of the radiobeacons and of the ship by dead reckoning. The latter is scaled from the chart, and the former is either scaled from the chart or taken from the list of radiobeacons in the Light List or H.O. Publication No. 205, Radio Navigational Aids.

The table is entered with the differences of longitude in degrees between the ship and station (the nearest tabulated value being used), and opposite the middle latitude between the ship and station, the correction to be applied is read.

The sign of the correction (bearings read clockwise from the north) will be as follows: In north latitude, the minus sign is used when the ship is east of the radiobeacon and the plus sign used when the ship is west of the radiobeacon. In south latitude, the plus sign is used when the ship is east of the radiobeacon, and the minus sign is used when the ship is west of the radiobeacon.

To facilitate plotting, 180 degrees should be added to or substracted from the corrected bearing, and the result plotted from the radiobeacon.

Should the position by dead reckoning differ greatly from the true position of the ship as determined by plotting the corrected bearings, a retrial should be made, using the new value as the position of the ship.

Radio bearings from other vessels.—Any vessel with a radio direction-finder can take a bearing on a vessel equipped with a radio transmitter. These bearings, however, should be used only as a check, as comparatively large errors may be introduced by local conditions surrounding the radio direction-finder unless known and accounted for. Although any radio station, for which an accurate position is definitely known, may serve as a radiobeacon for vessels equipped with a radio direction-finder, extreme caution must be exercised in their use. Stations established especially for maritime services are more reliable.

Loran.—A list of stations and descriptive details of the Loran System are given in the Light Lists and H.O. Publication No. 205, Radio Navigational Aids. Instructions, tables, and charts of the Loran System are published by the Navy Hydrographic Office. Coast charts of the United States with Loran lines are published by the Coast and Geodetic Survey.

Exact data cannot be given as to the accuracy to be expected in Loran positions since the accuracy depends to a large extent on the skill of the operator, the condition and type of receiving equipment, and the area of operation. The accuracy of a Loran fix is determined by the accuracy of the individual lines of position used to establish the fix and by their angle of intersection.

Loran position determinations on or near the baseline extensions are subject to geometric errors exceeding two nautical miles per microsecond and, therefore, should be avoided whenever possible. Loran is a long range aid to navigation and should not normally be used in pilot waters. The use of skywaves is not recommended within 250 miles of either station.

Caution must be used in matching Loran signals to insure that the ground wave signal of one station is not unknowingly matched with a skywave signal of the other station of the pair, or a one-hop skywave signal from station with a two-hop skywave signal from the other.

Numbering and recording of undocumented vessels.—Certain undocumented vessels are required to be numbered by the Federal Boating Act of 1958, effective April 1, 1960. They may be numbered either by the U.S. Coast Guard or by a state having an approved numbering system. Owners may obtain the necessary information from any Coast Guard District Commander.

Licensing of vessels.—Navigation laws pertaining to registry, enrollment, and licensing of vessels are administered by the **United States Bureau of Customs.** The bureau's functions also include issuing of commissions to yachts and the assignment of signal letters; the measurement of vessels, administration of tonnage duties, and the collection of tolls; the regulation of vessels in the coasting and fishing trade and limitation of the use of foreign vessels in waters under the jurisdiction of the United States; the recording of sales, conveyances, and mortgages of vessels; the protection of steerage passengers, and the remission of fines, penalties, and forfeitures incurred under the laws governing these matters. Collection districts and ports of entry located within the area covered by this Coast Pilot are tabulated in the Appendix.

Advance notice of arrival of vessels in ports.—The master or agents of certain vessels (foreign and domestic) are required to give advance notice to the Captain of the Port, U.S. Coast Guard, of the time of arrival in port; see **§ 124.10,** Chapter 2.

Danger signal.—It is stated in the **Pilot Rules for Inland Waters,** § 80.1, if, when steam vessels are approaching each other, either vessel fails to understand the course or intention of the other, from any cause, the vessel so in doubt shall immediately signify the same by giving several short and rapid blasts, not less than four, of the steam whistle, the danger signal. Article 18, Rule III, of the **Inland Rules of the Road** also contains this provision. The **International Rules of the Road,** Part D, Rule 28(b), states, in part, that, whenever a power-driven vessel which, under these Rules, is to keep her course and speed, is in sight of another vessel and is in doubt whether sufficient action is being taken by the other vessel to avert collision, she may indicate such doubt by giving at least five short and rapid blasts on the whistle.

Minesweeper signals.—United States vessels engaged in minesweeping operations have their maneuvering powers considerably hampered. All other vessels, whether steamers or sailing craft, should keep out of the way of the sweepers, remembering especially that it is dangerous to pass between the vessels of a pair or group sweeping together.

All vessels towing sweeps are to show a black ball at the foremasthead and at each yardarm **by day** and green lights instead of the black balls **by night;** the lights may only be exhibited when necessary to warn approaching friendly vessels. Other vessels are not to approach the sweepers nearer than 500 yards on either beam or 1,000 yards astern; under no circumstances is a vessel to pass through a formation of mine sweepers. The sweepers should be prepared to warn other vessels who persist in approaching too close by means of any of the appropriate signals from the International Code of Signals.

Improper use of searchlights prohibited.—No person shall flash or cause to be flashed the rays of a searchlight or other blinding light onto the bridge or into the pilothouse of any vessel under way (46 CFR 78.27-1(a)). The International Code Signal "ZO" may be made by a vessel inconvenienced by the glare of a searchlight in order to apprise the offending vessel of the fact.

Unnecessary whistling prohibited.—The unnecessary sounding of the vessel's whistle is prohibited within any harbor limits of the United States (46 CFR 78.23-1(a)).

Search and rescue operations.—The Coast Guard coordinates search and rescue operations in the cases of surface vessels or aircraft that are in distress or overdue. Search and rescue aircraft have special markings of inter-

national orange on the wing tips and wing-tip floats. The cooperation of vessel operators with search and rescue cutters and aircraft may mean the difference between life and death of persons in distress.

Operators of disabled wooden craft and persons adrift in rubber rafts or boats that are, or may consider themselves to be, the object of a search, should hoist on a halyard or otherwise place aloft as high as possible any metallic object that would assist their detection by radar. Coast Guard cutters and aircraft are radar equipped and thus are able to continue searching in darkness and during other periods of low visibility.

Search and rescue signals.—The information below is quoted from Annex 12 to The Convention on International Civil Aviation, Search and Rescue:

6.1—Signals with surface craft.

6.1.1—When it is necessary for an aircraft to direct a surface craft to the place where an aircraft or a surface craft is in distress, the aircraft shall do so by transmitting precise instructions by any means at its disposal. If such precise instructions cannot be transmitted or when necessary for any other reason, the instructions shall be given by using the procedure prescribed in 6.1.2.

Note.—Current maritime signalling procedures include:

For acknowledging receipt of signals, (i) the hoisting of the Code pennant (vertical red and white stripes) close up (meaning understood); (ii) the flashing of a succession of T's by signal lamp in the Morse Code; (iii) the changing of heading.

For indicating inability to comply, (i) the hoisting of the International flag N (a blue and white checkered square); (ii) the flashing of a succession of N's in the Morse Code.

6.1.2—The following procedures performed in sequence by an aircraft shall mean that the aircraft is directing a surface craft toward an aircraft or a surface craft in distress:

(a) Circling the surface craft at least once.

(b) Crossing the projected course of the vessel close ahead at a low altitude, opening and closing the throttle, or changing the propeller pitch.

(c) Heading in the direction in which the surface craft is to be directed. Repetition of such procedures shall have the same meaning.

6.1.3—The following procedure performed by an aircraft shall mean that the assistance of the surface craft to which the signal is directed is no longer required: Crossing the wake of the surface craft close astern at a low altitude, opening and closing the throttle, or changing the propeller pitch.

Mariners are advised that United States Government vessels or planes in distress may exhibit, in addition to the distress signals set forth under International Rules of the Road, an orange smoke visible by day.

Ships in distress.—Radio-equipped vessels requiring assistance may obtain the services of the Coast Guard by transmitting a request on the international distress and calling frequency 500 kc. to "Any Coast Guard Unit" (radio call NCU), or to any shore radio station addressed to "COGARD." Shore radio stations will forward to the Coast Guard all information regarding vessels requiring assistance unless such information is contained in a message specifically addressed elsewhere.

If the following information is included in the original request for assistance it will place the responsible Coast Guard officer in a position to determine immediately the types and numbers of vessels and aircraft required to render adequate aid, thus greatly facilitating the work of the Coast Guard and avoiding any unnecessary delay in the dispatching of assistance:

1. Name, type, and nationality of vessel; color, size and shape.
2. Position, course, and speed (including drift).
3. Nature of trouble and condition of vessel, sea, and wind. Action taken, if any.
4. Number of persons on board.
5. State whether or not Coast Guard assistance is required.

Small craft in distress.—Under the provision of the international regulations, which permits the use of any means available to a vessel or aircraft in distress to draw attention and obtain help, small commercial and private craft equipped with radiotelegraph or radiotelephone apparatus that cannot be operated on the international distress frequency of 500 kc. (600 m.) may usually obtain Coast Guard assistance by transmitting the distress signal or call and the message on the 2182 kc. frequency.

Submarine emergency identification signals.—The following smoke-bomb or flare signals are made by submarines of the United States in cases of necessity:

Green indicates torpedo has been fired; will be used to simulate torpedo firing on special exercises such as convoy exercises.

Yellow indicates that submarine is about to come to periscope depth from below periscope depth. Surface craft terminate antisubmarine counterattacks and clear vicinity of submarine. Do not stop propellers!

Red indicates an emergency condition within the submarine and she will surface immediately if possible. Surface vessels clear the area and stand by to give assistance after the submarine has surfaced. In case of repeated red signals, or if the submarine fails to surface within a reasonable time, she may be assumed to be disabled. Buoy the location, look for submarine marker buoy, and attempt to establish sonar communications. Advise naval authorities.

The foregoing, all of which mark the submarine's position, are fired from a submerged signal ejector into the air to a height of about 300 feet, then float downward slowly, suspended from a small parachute, and give colored illumination for about 30 seconds.

Submarines are also equipped with messenger buoys which are about 3 feet in diameter and are painted international orange. A submarine on the bottom in distress and unable to surface, will, if possible, release this buoy. An object of this description which is sighted on the surface of the water should be investigated and naval authorities advised.

The **CORPS OF ENGINEERS,** U.S. Army, has charge of the improvement of the rivers and harbors of the United States and of miscellaneous other civil works which include the administration of the Federal laws enacted for the protection and preservation of navigable waters of the United States, the establishment of regulations for the use, administration, and navigation of navigable waters, the approval of plans of bridges, the alteration of obstructive bridges, the establishment of anchorage grounds and harbor lines, the removal of sunken vessels obstructing or endangering navigation, and the granting of permits for structures or operations in navigable waters.

Information concerning the various ports, improvements, channel depths, navigable waters, and the condition of the Intracoastal Waterways in the areas under their jurisdiction may be obtained direct from the District Engineer offices; see Appendix.

Anchorage areas and restricted areas in most places are defined and regulations governing them are established by the Corps of Engineers. The regulations are enforced by the U.S. Coast Guard, and the areas are shown on the large-scale charts of the Coast and Geodetic Survey. Copies of the regulations may be obtained at the offices of the Corps of Engineers. The regulations also are copied into the appropriate Coast Pilots.

The **Port Series,** prepared jointly by the Corps of Engineers and the Maritime Administration and sold by the Superintendent of Documents, are complete reports on the principal seaports of the United States and are primarily of interest to commercial and industrial concerns. They cover the subjects of particular interest to the shipping world, such as the physical features of each port, its organization and practices, regulations regarding the movement of ships and goods, port dues and charges, fuel and water, rail connections, and commerce.

Protection of navigable waters.—Given below are extracts from the laws of the United States for the protection and preservation of the navigable waters of the United States.

That it shall not be lawful to throw, discharge, or deposit, or cause, suffer, or procure to be thrown, discharged, or deposited either from or out of any ship, barge, or other floating craft of any kind, or from the shore, wharf, manufacturing establishment, or mill of any kind, any refuse matter of any kind or description whatever, other than that flowing from streets and sewers and passing therefrom in a liquid state, into any navigable water of the United States, or into any tributary of any navigable water from which the same shall float or be washed into such navigable waters; and it shall not be lawful to deposit, or cause, suffer or procure to be deposited material of any kind in any place on the bank of any navigable water, or on the bank of any tributary of any navigable water, where the same shall be liable to be washed into such navigable water, either by ordinary or high tides, or by storms or floods, or otherwise, whereby navigation shall or may be impeded or obstructed.

That it shall not be lawful to tie up or anchor vessels or other craft in navigable channels in such a manner as to prevent or obstruct the passage of other vessels or craft; or to voluntarily or carelessly sink, or permit or cause to be sunk, vessels or other craft in navigable channels; or to float loose timber and logs, or to float what is known as sack rafts of timber and logs in streams or channels actually navigated by steamboats in such a manner as to obstruct, impede, or endanger navigation. And whenever a vessel, raft, or other craft is wrecked and sunk in a navigable channel, accidently or otherwise, it shall be the duty of the owner of such sunken craft to immediately mark it with a buoy or beacon during the day and a lighted lantern at night, and to maintain such marks until the sunken craft is removed or abandoned, and the neglect or failure of said owner so to do shall be unlawful; and it shall be the duty of the owner of such sunken craft to commence the immediate removal of the same and prosecute such removal diligently, and failure to do so shall be considered as an abandonment of such craft, and subject the same to removal by the United States as hereinafter provided for.

That, except in case of emergency imperiling life or property, or unavoidable accident, collision, or stranding, and except as otherwise permitted by regulations prescribed by the Secretary as hereinafter authorized, it shall be unlawful for any person to discharge, or suffer, or permit the discharge of oil by any method, means, or manner into or upon the coastal navigable waters of the United States from any vessel using oil as fuel for the generation of propulsion power, or any vessel carrying or having oil thereon in excess of that necessary for its lubricating requirements and such as may be required under the laws of the United States and the rules and regulations prescribed thereunder. The Secretary is authorized and empowered to prescribe regulations permitting the discharge of oil from vessels in such quantities, under such conditions, and at such times and places as in his opinion will not be deleterious to health or sea food, or a menace to navigation, or dangerous to persons or property engaged in commerce on such waters, and for the loading, handling, and unloading of oil.

WEATHER BUREAU.—Forecasts and warnings of the approach of storms over land and ocean areas are among the services of the Weather Bureau to navigation, commerce, agriculture, and the general public. Other warnings cover cold waves, frost, forest-fire hazard, and floods.

Meteorological information is collected and transmitted at hourly, 3-hourly, and 6-hourly intervals from land stations, ships at sea, and aircraft. These reports form a basis for the forecasting service, for summarization and publication of climatological data having general value and applicability, and for research basic to improvement of the national weather service.

Weather Bureau offices are located in many ports and other places throughout the continental United States and possessions. Stations in the area of concern to this Coast Pilot, at which the public may compare barometers against Weather Bureau barometers and discuss matters of weather service with Weather Bureau officials, are

listed in the Appendix. By international agreement, the Weather Bureau also bears a share in the maintenance and operation of certain weather ships on the free oceans.

Marine meteorological service.—The collection of observations from ships at sea is conducted on a purely voluntary and cooperative basis. The Weather Bureau supplies shipmasters with blank forms, printed instructions, and such other material as is essential to the making and recording of observations. In the course of an average peacetime year, more than 400,000 observations are received from vessels representing every maritime nation and reaching every quarter of the globe.

The **hurricane and storm warning service** was established primarily to aid marine interests. Storm warnings are prepared at regular district forecast centers and at special hurricane forecast centers. The warnings are distributed to the public through all neighboring Weather Bureau offices by radio, the press, and every other available means. During the West Indian hurricane season, June to November, inclusive, teletype circuits expedite the exchange of reports from the Atlantic and Gulf coasts; special reports are obtained from weather reconnaissance planes which fly near the storms and sometimes into the storm centers.

Coastal Warning Display System.—The Weather Bureau employs the following system for displaying warning signals at stations along United States coasts, including the Great Lakes, Hawaiian Islands, and Puerto Rico, when winds dangerous to navigation are forecast for any coastal section.

Small craft warning: One red pennant displayed by day and a red light above a white light at night to indicate that winds up to 33 knots and/or sea conditions dangerous to small craft operations are forecast for the area.

Gale warning: Two red pennants displayed by day and a white light above a red light at night to indicate that winds ranging from 34 to 47 knots are forecast for the area.

Whole gale warning: A single square red flag with black center displayed by day and two red lights at night to indicate that winds ranging from 48 to 63 knots are forecast for the area.

Hurricane warning: Two square red flags with black centers displayed by day and a white light between two red lights at night to indicate that winds of 64 knots and above are forecast for the area.

The **NAVY HYDROGRAPHIC OFFICE** exists for the improvement of the means of navigating safely the vessels of the U.S. Navy and the Merchant Marine by providing accurate nautical charts and related publications for foreign waters. Publications include Sailing Directions (pilots), Light Lists, Table of Distances, Radio Navigational Aids, Radio Weather Aids, International Code of Signals, the American Practical Navigator (Bowditch), and the Notice to Mariners.

The **weekly Notice to Mariners** contains corrections to Charts, Coast Pilots, Sailing Directions, Light Lists, and other publications. Part I, Western Hemisphere, covers North and South America, Greenland, and the Hawaiian Islands and includes general information of world interest. Part II, Eastern Hemisphere, covers notices to mariners and light lists for the rest of the world.

The **IMMIGRATION AND NATURALIZATION SERVICE** administers the laws relating to admission, exclusion, and deportation of aliens, the registration and fingerprinting of aliens, and the naturalization of aliens lawfully resident in the United States.

The designated ports of entry for aliens are divided into three classes. Class A is for all aliens. Class B is only for aliens who at the time of applying for admission are lawfully in possession of valid and unexpired resident aliens' border-crossing identification cards or valid nonresident aliens' border-crossing identification cards. Class C is only for aliens who are arriving in the United States as seamen as that term is defined in the last sentence of section 1 of the Immigration Act of 1917 (39 Stat. 874; 8 U.S.C. 173). [That the term seaman as used in this Act shall include every person signed on the ship's articles and employed in any capacity on board any vessel arriving in the United States from any foreign port or place.] No alien may enter the United States until he has been inspected by an immigration officer. A list of the ports of entry for aliens is given in the Appendix.

The **PUBLIC HEALTH SERVICE** administers hospitalization and outpatient treatment to legal beneficiaries of the Government; it also administers foreign and domestic quarantine laws, supervising the medical examination of immigrants and enforcing interstate laws.

Quarantine.—A vessel arriving at a port under the control of the United States shall undergo quarantine inspection prior to entry unless: (1) In the current voyage the vessel has not touched at any port other than those under the control of the United States, or in Canada, the Islands of St. Pierre and Miquelon, Iceland, Greenland, the West Coast of Lower California, Cuba, the Bahama Islands, the Canal Zone, the Bermuda Islands, and the Islands of Aruba and Curacao; or (2) in the current voyage the vessel has received pratique at a port under the control of the United States and since receiving same has not touched at a port other than those listed in (1); or (3) the vessel possesses a duplicate of a pratique issued at a port in Canada or the Canal Zone and since receiving same has not touched at ports other than those listed in (1).

A vessel otherwise exempt from quarantine inspection shall undergo such inspection prior to entering a port under the control of the United States if the vessel has aboard a person infected or suspected of being infected with certain communicable diseases, or if the vessel arrives from a port where at the time of departure there was present or suspected of being present cholera, plague, or yellow fever, or there was a significant increase in the prevalence of smallpox or typhus.

Vessels subject to quaratine inspection shall upon arrival at ports under the control of the United States fly

a yellow flag, anchor in the quarantine anchorage, and await inspection. Only the quarantine officer, quarantine employees, or pilots shall be permitted to board any vessel subject to quarantine inspection until after it has been inspected by the quarantine officer and granted pratique, except with the permission of the quarantine officer. A person boarding such vessel shall be subject to the same restrictions as those imposed on the persons on the vessel.

Sanitary inspection.—Vessels arriving at a port under the control of the United States from a foreign port shall be subject to sanitary inspection to ascertain whether there exists rodent, vermin, or insect infestation or other unsanitary condition requiring measures for the prevention of the introduction, transmission, or spread of communicable disease.

In general, where State quarantine is in force, the minimum requirements of quarantine are in accordance with the regulations of the Public Health Service. National quarantine regulations will be found at the stations of the service and at United States consulates, and will be furnished to vessels upon application to officers of the service or to the Bureau in Washington, D.C.

Medical service.—United States merchant seamen are entitled to medical relief obtainable through the Public Health Service. A United States seaman is one engaged on board in care, preservation, or navigation of any registered, enrolled, or licensed vessel of the United States, or in the service, on board, of those so engaged. **Hospitals, outpatient clinics,** and **outpatient offices** of the Public Health Service are located at the addresses given in the Appendix. Free medical advice is furnished to seamen by radio; see H.O. Publication 205, Radio Navigational Aids.

RADIO.—The Federal Communications Commission controls radio communications in the United States and in all possessions except the Panama Canal Zone. Commission inspectors have authority to board ships to detemine whether their radio stations comply with international treaties, Federal laws, and Commission regulations. The Commission has field offices in the principal United States ports. Information concerning ship radio regulations and service documents may be obtained from the Federal Communications Commission, Washington 25, D.C., or from any of the field offices.

Marine weather broadcasts.—Information on weather over North Atlantic and North Pacific waters is issued by the Weather Bureau for broadcast by commercial and Government radio stations. Marine bulletins for the western North Atlantic are broadcast by Navy station NSS, Washington, D.C.; those for the eastern North Pacific are transmitted by KPH, Bolinas, Calif., and KTK, San Francisco, Calif. A separate bulletin for Central Pacific waters is broadcast by KHK, Kahuku, Hawaii. The marine bulletins include storm advisories and forecasts. Station frequencies, broadcast times, and areas affected are stated in H.O. Publication 206, Radio Weather Aids.

Advisories and forecasts also are broadcast by Navy stations NBA, Balboa, C.Z.; NPG, San Francisco, Calif.; NHB, Kodiak, Alaska; and NPM, Honolulu, Hawaii. Additional surface and upper-air data for preparation of weather maps at sea is contained in the Synoptic Weather Bulletins broadcast by Federal Aviation Agency station WBR, Miami, Fla.

Local weather bulletins, containing coastal-area forecasts, storm advisories, and weather summaries for specific areas, are broadcast on regular schedules by many Government and commerical radio stations.

Emergency broadcasts by Navy radio stations.—Storm advisories and notices concerning the safety of navigation at sea are broadcast by Navy radio stations in accordance with the degree of urgency, as follows:

A. Notices of tidal waves, hurricanes, typhoons, and cyclones so imminent as to warrant immediate broadcasting: (1) One transmission immediately on receipt; (2) one transmission at the end of the first ensuing silent period; and (3) one transmission during the first ensuing on-watch period for ships with one operator, in case both previous transmissions were made during the off-watch period.

B. Storm warnings and notices of less urgency than those specified in (A) and other than those normally included in scheduled hydrographic broadcasts: (1) One transmission at the end of the first ensuing silent period; and (2) one transmission during the on-watch period for ships with one operator in case the previous transmission was made during an off-watch period.

These broadcasts are preceded by transmission of the Urgent Signal (XXX) or the Safety Signal (TTT) and a preliminary announcement on 500 kc. of the message to follow on the station working frequency.

Emergency broadcasts by Coast Guard radio stations.—Storm and hurricane warnings, advisories and other urgent marine information are broadcast by Coast Guard radio stations:

A. By radiotelegraph on the station's medium frequency immediately following the first silent period after receipt of the message at the radio station (HH+18 or HH+48) preceded by an initial call on 500 kc. Whenever this transmission occurs outside the watch hours for single radio operator ships, the message will be repeated at the end of the next silent period falling within the radio watch hours for such vessels. If a station makes daily broadcasts of marine information, the message will also be included in its next scheduled transmission.

B. By radiotelephone on 2182 kc. immediately following receipt of the message at the radio station and repeated at the station's next scheduled broadcast.

Radiotelephone broadcasts of weather information (United States).—Transmission by voice of weather information from the Weather Bureau is made through certain radio stations of the Coast Guard and of the commercial coastal radiotelephone service. These broadcasts are followed immediately by reports of dangerous obstructions and changes in aids to navigation.

This service gives to yachts, fishing craft, tugboats, and other vessels equipped with a radio receiving set having a band covering the frequency range of 2 to 3 mega-

cycles, official weather information from the Weather Bureau in plain language and on regular schedules.

These radiotelephone broadcasts are made twice and, in some cases, four times daily at definite times and include marine forecasts, and storm warnings whenever they are issued, for coastal waters in or adjacent to the areas served by the radio stations.

Certain local radio stations in the standard broadcast band have microphones installed in nearby Weather Bureau offices. From these stations forecasts, weather summaries, and warnings are broadcast on regular schedule. For stations and schedules in the area covered by this volume, see the Appendix.

West Indies.—Coast Guard station NMR, San Juan, P.R., broadcasts twice daily by radiotelephone and radiotelegraph a weather bulletin consisting of marine forecasts and weather summary for the Caribbean Sea area and small-craft, storm, and hurricane warnings when applicable.

Mexico and Canada.—Scheduled broadcasts of weather information affecting the coasts of Mexico and Canada are made by designated stations of those countries on marine frequencies by both radiotelegraph and radiotelephone.

Alaska.—Weather broadcasts are made by radiotelegraph by Naval station NDB, Kodiak, and Coast Guard station NMJ, Ketchikan. Radiotelephone broadcasts are made by NMJ and by various stations of the Alaska Communication System operating in the 2-megacycle band.

Reports from ships.—The master of every ship of the United States equipped with radio transmitting apparatus, on meeting with a tropical storm, dangerous ice, derelict, or any other direct danger to navigation, is required to cause to be transmitted a report of these dangers to ships in the vicinity and to the appropriate Government agencies.

During the West Indies hurricane season, June 1 to November 30, ships in the Gulf of Mexico, Caribbean Sea area, southern North Atlantic Ocean, and the Pacific waters west of Central America and Mexico are urged to cooperate with the Weather Bureau in furnishing these special reports in order that warnings to shipping and coastal areas may be issued.

TIME SIGNALS.—The **United States system** of broadcasting time signals begins at 55 minutes 0 second of some hour and continues for 5 minutes. Signals are transmitted on every second of this period except the 29th of each minute, the 51st of the first minute, the 52d of the second minute, the 53d of the third minute, the 54th of the fourth minute, the last 4 seconds of the first 4 minutes, and the last 9 seconds of the last minute. The hour signal is a 1.3-second dash, which is much longer than the others.

In all cases the beginnings of the dashes indicate the beginnings of the seconds, and the ends of the dashes are without significance. The number of dashes sounded in the group at the end of any minute indicates the number of minutes of the signal yet to be sent. In case of signal failure or error, the signal is repeated 1 hour later.

The **National Bureau of Standards** broadcasts time signals from its radio station **WWV** near Washington, D.C., on radio frequencies of 2.5, 5, 10, 15, 20, and 25 megacycles, which are on the air at all times, day and night. This insures reliable coverage of the United States and extensive coverage of other parts of the world. The services include time announcements, standard time intervals, standard audio frequencies, and radio-propagation disturbance-warning notices.

Time announcements.—The audio frequencies are interrupted at precisely 1 minute before each hour and each 5 minutes thereafter. They are resumed precisely on the hour and each 5 minutes thereafter. The beginnings of the periods, when the audio frequencies are resumed, are in agreement with the basic service of the U.S. Naval Observatory, and accordingly they accurately mark the hour and successive 5-minute periods.

Greenwich Mean Time is announced in telegraphic code each 5 minutes. The zero- to 24-hour system is used. This announcement refers to the end of the announcement interval. A voice announcement of eastern standard time is given following each telegraphic code announcement.

Standard time intervals.—On each carrier frequency is a pulse which occurs at intervals of precisely 1 second. The pulse is omitted at the beginning of the last second of every minute. The 1-minute, 4-minute, and 5-minute intervals, synchronized with the second pulses, are marked by the beginning or ending of the periods when the audio frequencies are off.

A **radio-propagation disturbance warning** forecast is transmitted in Morse code twice each hour at 19½ and 49½ minutes past the hour. These warnings tell users of radio transmission paths over the North Atlantic the condition of the ionosphere at the time of the announcement and how good or bad communication conditions are expected to be for the next 12 hours. During a period of radio-propagation disturbance, direction-finder observations may be unreliable; the letters "N", "U", and "W" signify that radio propagation conditions are, respectively, normal, unsettled, or disturbed.

Radio station **WWVH**, on the island of Maui, Hawaii, broadcasts on 5, 10, and 15 megacycles. The schedule of broadcasts is the same as that of station WWV for standard time intervals, time announcements in code, standard audio frequencies, and accuracy. Simultaneous reception of WWV and WWVH does not interfere with ordinary use of the standard frequency and time signals.

The WWVH broadcast is interrupted for 4 minutes following each hour and half hour and for periods of 34 minutes each day beginning at 1900 GMT.

DESTRUCTIVE WAVES.—Unusual sudden changes in water level can be caused by seismic sea waves or violent storms. These two types of destructive waves have be-

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come commonly known as **tidal waves**, a name which is technically incorrect as they are not the result of tide-producing forces.

Seismic sea waves are set up by submarine earthquakes. Many such seismic disturbances do not produce sea waves and often those produced are small, but the occasional large waves can be very damaging to shore installations and dangerous to ships in harbors.

These waves travel great distances and can cause tremendous damage on coasts far from their source. The wave of April 1, 1946, that originated in the Aleutian Trench demolished nearby Scotch Cap Lighthouse and also caused $25,000,000 damage in the Hawaiian Islands 2,200 miles away.

The speed of seismic sea waves varies with the depth of the water, reaching 300 to 500 knots in the deep water of the open ocean. In the open sea they cannot be detected from a ship or from the air because their length is so great, sometimes a hundred miles, as compared to their height, which is usually only a few feet. Only on certain types of shelving coasts do they build up into waves of disastrous proportions.

There is usually a series of waves with crests 10 to 40 minutes apart, and the highest may occur several hours after the first wave. Sometimes the first noticeable part of the wave is the trough which causes a recession of the water from shore, and people who have gone out to investigate this unusual exposure of the beach have been engulfed by the oncoming crest. Such an unexplained withdrawal of the sea should be considered as nature's warning of an approaching wave.

Improvements have been and are being made in the quick determination and reporting of earthquake epicenters, but no method has yet been perfected for determining whether a sea wave will result from a given earthquake. The problem of detecting and reporting the existence of seismic sea waves when they do occur is being studied. A reporting system has been organized in the Pacific with its center in the Hawaiian Islands.

When an advance warning is available, waterfront areas should be vacated for higher ground and ships in the vicinity of land should head for the deep water of the open sea.

Storm waves.—A considerable rise or fall in the level of the sea along a particular coast may result from strong winds and a sharp change in barometric pressure. In cases where the water level is raised, higher waves can form with greater depth and the combination can be destructive to low regions, particularly at high stages of tide. Extreme low levels can result in depths which are considerably less than those shown on nautical charts. This type of wave occurs especially in coastal regions bordering on shallow waters which are subject to tropical storms.

Seiche is a stationary vertical wave oscillation with a period varying from a few minutes to an hour or more, but somewhat less than the tidal periods. It is usually attributed to external forces such as strong winds, changes in barometric pressure, swells, or seismic sea waves disturbing the equilibrium of the water surface. Seiche is found both in enclosed bodies of water and superimposed upon the tides of the open ocean. When the external forces cause a short-period horizontal oscillation of the water, it is called **surge**.

The combined effect of seiche and surge sometimes makes it difficult to maintain a ship in its position alongside a pier even though the water may appear to be completely undisturbed, and heavy mooring lines have been parted repeatedly under such conditions. Pilots advise taut lines to reduce the effect of the surge.

2. NAVIGATION REGULATIONS

THIS chapter contains the sections of **Code of Federal Regulations, Title 33, Navigation and Navigable Waters,** that are of most importance in the areas covered by Coast Pilot 1. The sections are from Part 82, Boundary Lines of Inland Waters; Part 124, Control Over Movement of Vessels; Part 202, Anchorage Regulations; Part 203, Bridge Regulations; Part 204, Danger Zone Regulations; and Part 207, Navigation Regulations.

PART 82—BOUNDARY LINES OF INLAND WATERS:

§ 82.1 General basis and purpose of boundary lines. By virtue of the authority vested in the Commandant of the Coast Guard under section 101 of Reorganization Plan No. 3 of 1946 (3 CFR, 1946 Supp., Ch. IV), and section 2 of the act of February 19, 1895, as amended (28 Stat. 672, 33 U.S.C. 151), the regulations in this part are prescribed to establish the lines dividing the high seas from rivers, harbors, and inland waters in accordance with the intent of the statute and to obtain its correct and uniform administration. The waters inshore of the lines described in this part are "inland waters," and upon them the inland rules and pilot rules made in pursuance thereof apply. The waters outside of the lines described in this part are the high seas and upon them the international rules apply. The regulations in this part do not apply to the Great Lakes or their connecting and tributary waters.

§ 82.2 General rules for inland waters. At all buoyed entrances from seaward to bays, sounds, rivers, or other estuaries for which specific lines are not described in this part, the waters inshore of a line approximately parallel with the general trend of the shore, drawn through the outermost buoy or other aid to navigation of any system of aids, are inland waters, and upon them the inland rules and pilot rules made in pursuance thereof apply, except that Pilot Rules for Western Rivers apply to the Red River of the North, the Mississippi River and its tributaries above Huey P. Long Bridge, and that part of the Atchafalaya River above its junction with the Plaquemine-Morgan City alternate waterway.

§ 82.5 All harbors on the coast of Maine, New Hampshire, and Massachusetts between West Quoddy Head, Maine, and Cape Ann Lighthouse, Mass. A line drawn from Sail Rock Lighted Whistle Buoy 1 to the southeasternmost extremity of Long Point, Maine, to the southeasternmost extremity of Western Head; thence to the southeasternmost extremity of Old Man; thence to the southernmost extremity of Double Shot Islands; thence to Libby Islands Lighthouse; thence to Moose Peak Lighthouse; thence to the eastern extremity of Little Pond Head. A line drawn from the southern extremity of Pond Point, Great Wass Island, to the southernmost point of Crumple Island; thence to Petit Manan Lighthouse; thence to Mount Desert Lighthouse; thence to Matinicus Rock Lighthouse; thence to Monhegan Island Lighthouse; thence to Seguin Lighthouse; thence to Portland Lightship; thence to Boon Island Lighthouse; thence to Cape Ann Lighted Whistle Buoy 2.

§ 82.10 Massachusetts Bay. A line drawn from Cape Ann Lighted Whistle Buoy 2 to Boston Lightship; thence to Cape Cod Lighthouse.

PART 124—CONTROL OVER MOVEMENT OF VESSELS:

§ 124.10 Advance notice of vessel's time of arrival to Captain of the Port.—(a) The master or agents of every vessel (foreign and domestic) shall give at least 24 hours' advance notice of the time of such vessel's arrival to the Captain of the Port where the vessel is to arrive. The master or agents of every foreign vessel, as well as every documented vessel of the United States, destined from one port or place to another port or place shall give at least 24 hours' advance notice of the time of such vessel's arrival to the Captain of the Port where the vessel is to arrive. For such foreign and domestic vessels, this 24 hours' advance notice of time of arrival is applicable at every port of call. In any case where the port of arrival is not located within the geographical area assigned to a particular Captain of the Port, this advance notice of time of arrival shall be made to the Commander of the Coast Guard District in which such a port or place is located. In a case of force majeure, if it is not possible to give at least a 24 hours' advance notice of time of arrival, then an advance notice as early as practicable shall be furnished.

(b) The master and agents of a vessel entering the Great Lakes shall be exempt from the requirements of paragraph (a) of this section, but the master or agents of such vessel if bound for a United States port shall:

(1) Immediately on the vessel's entry into Lake Ontario inbound, advise the Commander, 9th Coast Guard District, of the vessel's first intended United States port of call and estimated time of arrival in that port.

(2) Upon the vessel's arrival in the first United States port cause to be delivered to the Captain of the Port an itinerary giving the vessel's foreign ports of call during the preceding six months or last visit to a U.S. port whichever is later, the intended ports of call on the Great Lakes, and the estimated dates of arrival.

(3) Thereafter, immediately advise the Commander,

9th Coast Guard District, when the necessity of a deviation from that itinerary becomes known.

(c) The master or agents of a vessel engaged upon a scheduled route need not furnish the advance notice of arrival in individual instances if a copy of the schedule is filed with the Captain of the Port for each port of call named in the schedule and the times of arrival at each such port are adhered to.

(d) The masters of merchant vessels (except on coastwise voyages of 24 hours or less) reporting in accordance with the U.S. Coast Guard's voluntary "Merchant Vessel Reporting Program" shall be considered to be in constructive compliance with the requirements of paragraph (a) of this section, and no additional advance notice of vessels' arrival reports to the Captain of the Port are required. The master or agent of a vessel on coastwise voyages of 24 hours or less shall report the advance notice of vessel's arrival as provided in paragraph (a) of this section.

(e) In the case of a vessel which is engaged in operations in and out of the same port, either on voyages to sea and return without having entered any other port, or on coastwise voyages within the same Coast Guard District, or from ports within the First, Ninth, Thirteenth or Seventeenth Coast Guard Districts to adjacent Canadian ports, and where no reason exists which renders such action prejudicial to the rights and interests of the United States, the Coast Guard District Commander having jurisdiction may prescribe conditions under which Coast Guard Captains of the Ports may consider such a vessel as being in constructive compliance with the requirements of this section without the necessity for reporting each individual arrival.

(f) Failure to give advance notice will subject the master or agents of a vessel to the penalties of fine and imprisonment, as well as subject the vessel to seizure and forfeiture, as provided in section 2, title II of the act of June 15, 1917, as amended, 50 U.S.C. 192. In addition, such failure may result in delay in the movement of the vessel from the harbor entrance to her facility destination within the particular port.

(g) The requirements of this section do not apply to the following:

(1) Vessels which, during the course of their voyages, do not navigate any portion of the high seas; and

(2) Vessels which are numbered by the Coast Guard, or by any State pursuant to the provisions of the Federal Boating Act of 1958 (Public Law 85–911; 46 U.S.C. 527–527h).

(h) The term "high seas", as used in this section, shall be construed to mean any portion of the open sea below the low water mark along the coasts and projections of the land across the entrances of bays, sounds and other bodies of water which join the open sea.

PART 202—ANCHORAGE REGULATIONS:

§ 202.1 General. (a) The areas described in Subpart A of this part are designated as special anchorage areas pursuant to the authority contained in an act amending laws for preventing collisions of vessels approved April 22, 1940 (54 Stat. 150). Section 1 of the act amended Article 11 of the Navigation Rules for Harbors, Rivers, and Inland Waters Generally (33 U.S.C. 180), section 2 amended Rule 9 of the Navigation Rules for Great Lakes and Their Connecting and Tributary Waters (33 U.S.C. 258), and section 3 amended Rule 10 of the Navigation Rules for Red River of the North and Rivers Emptying into Gulf of Mexico and Tributaries (33 U.S.C. 319). Vessels not more than 65 feet in length, when at an anchor in any special anchorage area, shall not be required to carry or exhibit the white anchor lights required by the Navigation Rules.

(b) The anchorage grounds for vessels described in Subpart B of this part are established, and the rules and regulations in relation thereto adopted, pursuant to the authority contained in section 7 of the River and Harbor Act approved March 4, 1915 (38 Stat. 1053; 33 U.S.C. 471).

(c) All bearings in this part are referred to true meridian.

Subpart A—Special Anchorage Areas:

§ 202.3 Kennebec River at Randolph, Maine. The area comprises that portion of the waterway beginning at a point on the shoreline 450 feet upstream from the east end of the Gardiner-Randolph Highway bridge at latitude 44°13′54″, longitude 69°46′06″, thence extending 213° (True) to the upstream end of the east bridge pier at latitude 44°13′49″, longitude 69°46′11″, thence extending along the shoreward side of the pier to its downstream end at latitude 44°13′47″, longitude 69°46′10″, thence 113° (True) to a point on the shoreline 350 feet downstream from the east end of the bridge at latitude 44°13′46″, longitude 69°46′05″, thence along the shore to the point of beginning.

NOTE: The area is principally for use by yachts and other recreational craft. Fore and aft moorings will be allowed. Temporary floats or buoys for marking anchors in place will be allowed. Fixed mooring piles or stakes are prohibited. All moorings shall be so placed that no vessel, when anchored, shall at any time extend beyond the limits of the area. All anchoring in the area shall be under the supervision of the local harbor master or such authority as may be designated by authorities of the Town of Randolph, Maine.

§ 202.4 Kennebec River at Augusta, Maine. The area comprises that portion of the waterway on the east side of the river beginning at a point on the east shore at the east end of the north side of the highway bridge at mile 43.8, thence southwesterly along the north side of the bridge, to a point within 30 feet of the east limit of the project channel, thence northerly along a line 30 feet easterly of and parallel to the east limit of the channel to Kennebec Bridge at mile 44.1, thence easterly along the south side of the bridge to the shore, thence along the shore to the point of beginning.

NOTE: The area is reserved for yachts and other recreational craft. Fore and aft moorings will be allowed.

Temporary floats or buoys for marking anchors in place will be allowed in the area. Fixed mooring piles or stakes are prohibited. All moorings shall be so placed that no vessel, when anchored, shall at any time extend into the channel. All anchoring in the area shall be under the supervision of the local harbor master or such other authority as may be designated by the authorities of the City of Augusta, Maine.

§ 202.5 Casco Bay, Maine—(a) Beal's Cove, west side of Orr Island, Harpswell. The entire cove as defined by the shoreline and a line across the entrance bearing 215° and tangent to the shore on the north side.

(a–1) Merriconeag Sound, Harpswell. The area comprises that portion of the Sound beginning at a point on the shoreline about 1,000 feet northeasterly from the southwesterly extremity of Orr's Island at latitude 43°45′09″, longitude 69°59′14″, thence extending 290° (True) to a point at latitude 43°45′10″, longitude 69°59′20″, thence extending 20° (True) to a point at latitude 43°45′34″, longitude 69°59′05″, thence extending 110° (True) to a point on the shoreline at latitude 43°45′33″, longitude 69°58′58″, thence along the shoreline to the point of beginning.

NOTE: The area is principally for use by yachts and other recreational craft. Fore and aft moorings will be allowed. Temporary floats or buoys for marking anchors in place will be allowed. All moorings shall be so placed that no vessel, when anchored, shall at any time extend beyond the limits of the area. Fixed mooring piles or stakes are prohibited. All anchoring in the area shall be under the supervision of the local harbor master or such authority as may be designated by authorities of the Town of Harpswell, Maine.

(b) Harpswell Harbor, east side of Harpswell Neck, Harpswell. The entire area lying westerly of a line bearing 8° from the eastern extremity of Stover's Point to the point of land at the northerly end of the harbor, said point of land bearing approximately 275° from the observatory on Orr Island.

(c) Basin Cove, west side of Harpswell Neck, Harpswell. All of the area lying northeasterly of a line bearing 350° from the northwest corner of the entrance to the cove.

(d) Mussel Cove and adjacent waters at Falmouth Foreside, Falmouth. All the waters lying westerly of a line bearing 123° from Dock House (F.S.) 200 yards, thence 212° to Prince Point.

(e) Harraseeket River. That portion of the Harraseeket River within the mean low water lines, between Stockbridge Point and Weston Point, excluding therefrom a thoroughfare, 100 feet wide, the center line of which follows the natural channel.

NOTE: This area is reserved for yachts and other small recreational craft. Fore and aft moorings will be allowed in this area. Temporary floats or buoys for marking anchors or moorings in place will be allowed. Fixed mooring piles or stakes are prohibited. All moorings shall be so placed that no vessel when anchored shall at any time extend into the thoroughfare. All anchoring in the area shall be under the supervision of the local harbor master or such other authority as may be designated by the authorities of the Town of Freeport, Maine.

§ 202.6 Portland Harbor, Portland, Maine (between Little Diamond Island and Great Diamond Island). Beginning at the southeasterly corner of the wharf, at the most southerly point of Great Diamond Island at latitude 43°40′13″, longitude 70°12′00″; thence extending southwesterly to the northeasterly corner of the wharf on the easterly side of Little Diamond Island at latitude 43°40′03″, longitude 70°12′15″; thence extending along the northerly side of the wharf to its shoreward end at latitude 43°40′03″, longitude 70°12′17″; thence extending along the shoreline of Little Diamond Island to latitude 43°40′11″, longitude 70°12′20″; thence extending northeasterly to the shoreline of the southerly side of Great Diamond Island at latitude 43°40′21″, longitude 70°12′06″; thence extending along the shoreline of Great Diamond Island to the shoreward end of a wharf at latitude 43°40′15″, longitude 70°12′02″; thence extending along the southwesterly side of the wharf to the point of beginning.

NOTE: The area is principally for use by yachts and other recreational craft. Temporary floats or buoys for marking anchors will be allowed. Fixed mooring piles or stakes are prohibited. The anchoring of vessels and placing of temporary moorings will be under the jurisdiction, and at the discretion of the local harbor master. All moorings shall be so placed that no moored vessels will extend beyond the limit of the area.

§ 202.10 Portsmouth Harbor, N.H., north of Newcastle Island. Southeasterly of a line bearing 74°30′ from the northeasterly extremity of Goat Island; southerly of a line bearing 89°30′ and passing through a point 100 feet due north of the northern extremity of Salamander Point; southwesterly of a line bearing 300° from Portsmouth Harbor Light; northwesterly of a line bearing 215°30′ from the southwest corner of Frisbee Wharf; and northerly of the shore line and of the breakwater between Newcastle Island and Goat Island.

§ 202.15 Newburyport Harbor, Mass. Eastward of a line bearing due north from the northeast corner of the American Yacht Club property to a point 237° and about 900 feet from South Pier; southward of a line bearing 70° to a point 212° and 310 feet from South Pier, thence 90° to a point 180° and about 600 feet from North Pier; westward of a line bearing 180° from North Pier to the shore line.

§ 202.20 Parker River, Newbury, Mass., 1½ miles above mouth. That portion of the river extending 3,800 feet downstream from the highway bridge on Route 1A; excluding therefrom a clear approach to the bridge 100 feet wide following generally the deepest water.

§ 202.22 Plum Island Sound off Great Neck, Mass. The waters of Plum Island Sound within the quadrant of a circle bounded by radii 2,600 feet long, bearing due

north and 90°, respectively, from latitude 42°42′18″, longitude 70°48′12″, and the included arc.

§ 202.25 Beverly and Salem Harbors, Mass.—(a) Beverly Harbor, north of Salem Neck. Southwest of a line bearing 315° from a point due north of and 60 yards from the northerly corner of the Salem Willows Municipal Pier, south of a line bearing 90° from Monument Bar Beacon; east of a line bearing 180° from Monument Bar Beacon; north of a line bearing 278° from the northerly end of the Salem Willows Yacht Club house; and northwest of a line extending from the northerly end of the Salem Willows Yacht Club house to the starting point due north of and 60 yards from the northerly corner of the Salem Willows Municipal Pier.

(b) Bass River. All of the area upstream of the highway bridge (Popes Bridge) outside of the dredged channel.

(c) Salem Harbor. That part of the harbor lying southwesterly of a line bearing 116° from the eastern extremity of Long Point to a point 20° from the beacon southeast of Pickering Point; thence bearing 160° to a point 47° from the aforesaid beacon; thence bearing 99° to the shore; excluding therefrom the dredged channel and basin to the Dion Boat Yard.

§ 202.30 Boston Harbor, Mass., and adjacent waters—(a) Lynn Harbor. North of a line bearing 244° from the tower of the Metropolitan District Building, extending from the shore to a point 100 feet from the east limit of the channel; east of a line bearing 358°, extending thence to a point 100 feet east of the northeast corner of the turning basin; south of a line bearing 88°, extending thence to the shore; and south and west of the shore line to its intersection with the south boundary.

(b) Vicinity of Pleasant Park Yacht Club, Winthrop. Southerly of a line bearing 276° from a point on the west side of Pleasant Street, Winthrop, 360 feet from the southwest corner of its intersection with Main Street; westerly of a line bearing 186° from a point on the south side of Main Street 140 feet from the southwest corner of its intersection with Pleasant Street; northerly of a line bearing 256° from a point on the west side of Pleasant Street 550 feet from the southwest corner of its intersection with Main Street; and easterly of a line bearing 182° from a point on the south side of Main Street 640 feet from the southwest corner of its intersection with Pleasant Street.

(c) Mystic River, east side of Chelsea Bridge North. Northerly of the northerly fender pier of Chelsea Bridge North; easterly of Chelsea Bridge North; southerly of the shore line; and westerly of a line bearing 7° from the easterly end of the aforesaid fender pier.

(d) Mystic River, west side of Chelsea Bridge North. Northerly of the northerly fender pier of Chelsea Bridge North and a line extending from the westerly end of the shoreward face of the aforesaid fender pier to the southeasterly corner of the wharf projecting from the Naval Hospital grounds; easterly of the aforesaid wharf; southerly of the shore of the Naval Hospital grounds; and westerly of Chelsea Bridge North.

(e) Vicinity of South Boston Yacht Club, South Boston. Northerly of a line bearing 96° from the stack of the heating plant of the Boston Housing Authority in South Boston; easterly of a line bearing 5° from the west shaft of the tunnel of the Boston Main Drainage Pumping Station; southerly of the shore line; and westerly of a line bearing 158° from the northeast corner of the iron fence marking the east boundary of the South Boston Yacht Club property.

(f) Dorchester Bay, in vicinity of Savin Hill Yacht Club. Northerly of a line bearing 64° from the stack of the old power plant of the Boston Elevated Railway on Freeport Street in Dorchester; westerly of a line bearing 163° from the stack of the Boston Main Drainage Pumping Station on the Cow Pasture in Dorchester; and southerly and easterly of the shore line.

(g) Dorchester Bay, in vicinity of Dorchester Yacht Club. Eastward of a line bearing 21° from the stack located a short distance northwestward of the Dorchester Yacht Club; southward of a line bearing 294° from the southerly channel pier of the highway bridge; westward of the highway bridge and the shore line; and northward of the shore line.

(h) Quincy Bay, in vicinity of Wollaston and Squantum Yacht Clubs. Northwesterly of a line bearing 36°30′ from a point on the shore 2,600 feet easterly of the east side of the Wollaston Yacht Club landing; southwesterly of a line bearing 129°15′ from the water tank in Squantum; and southeasterly and northeasterly of the shore line.

(i) Quincy Bay, in vicinity of Merrymount Yacht Club. South of a line starting from a point bearing 246°, 3,510 yards, from the stack of the pumping station on Nut Island, and extending thence 306° to the shore; west of a line bearing 190° from the aforesaid point to the shore; and north and east of the shore line.

(j) Weymouth Fore River, in vicinity of Quincy Yacht Club. Southwesterly of a line bearing 119° from the outer end of the wharf at Nut Island; northwesterly of a line bearing 199°30′ from Pig Rock Light to the eastern end of Raccoon Island; northerly of Raccoon Island and of a line from its western extremity bearing 245° from Beacon 2A; and easterly of the shore of Houghs Neck.

(k) Weymouth Fore River, in vicinity of Wessagussett Yacht Club. Southwesterly of a line bearing 117° from channel light "4"; southeasterly of a line 150 feet from and parallel to the meandering easterly limit of the dredged channel; easterly of a line bearing 188° from the eastern extremity of Rock Island Head; and northwesterly of the shore line.

(l) Weymouth Back River, in vicinity of Eastern Neck. The cove on the north side of the river lying northerly of a line bearing 264°30′ from the southwesterly corner of the American Agricultural Chemical Company's wharf (Bradley's Wharf) to the shore of Eastern Neck, about 2,200 feet distant.

§ 202.35 Plymouth Harbor, Mass. Southeasterly of a line bearing 39° from Splitting Knife front range light; southwesterly of a line bearing 123° from a point on the southeast face of the State Pier, 40 feet from the northeast corner (intersection of the northeast and southeast faces produced) of said pier; westerly of a line bearing 356° from the northeast corner of the Pilgrim Yacht Club wharf; and northeasterly of the shore line.

Subpart B—Anchorage Grounds.

§ 202.130 Rockland Harbor, Maine—(a) The anchorage grounds—(1) Anchorage A. Beginning at a point bearing 158°, 1,075 yards, from Rockland Breakwater Light; thence 255°, 2,000 yards, to a point bearing 225° from Rockland Breakwater Light; thence 345°, 700 yards, to a point bearing 244° from Rockland Breakwater Light; thence 75°, 1,200 yards, to a point bearing 222° from Rockland Breakwater Light; and thence 120°, 1,000 yards, to the point of beginning.

(2) Anchorage B. Beginning at a point bearing 273°, 400 yards, from Rockland Breakwater Light; thence 273°, 700 yards, to a point bearing 273° from Rockland Breakwater Light; thence 349°, 850 yards, to a point bearing 305° from Rockland Breakwater Light; thence 89°, 700 yards, to a point bearing 328° from Rockland Breakwater Light; and thence 169°, 900 yards, to the point of beginning.

(3) Anchorage C. Beginning at a point bearing 244°, 1,715 yards, from Rockland Breakwater Light; thence 260°, 490 yards, to a point bearing 248° from Rockland Breakwater Light; thence 350°, 580 yards, to a point bearing 263° from Rockland Breakwater Light; thence 83°, 480 yards, to a point bearing 263° from Rockland Breakwater Light; and thence 169°, 550 yards, to the point of beginning.

(b) The regulations. (1) Anchorages A and B are general anchorages reserved for merchant vessels over 100 feet in length. Anchorage C is reserved for small commercial and pleasure craft.

(2) A distance of approximately 500 yards shall be left between Anchorages A and B for vessels entering or departing from the Port of Rockland. Any vessel not anchoring in these areas shall be ready to move on short notice when ordered to do so by the Captain of the Port.

(3) All other vessels within the Rockland Harbor area are prohibited from anchoring within 300 yards or operating within 100 feet of any navy yard, shipbuilding plant, power plant, oil terminal, marine terminal, munitions plant, military or naval arsenal or depot, warehouse, or freight pier without permission from the Captain of the Port, Rockland, Maine, or his authorized representative.

§ 202.131 Kennebec River in vicinity of Bath, Maine—(a) The anchorage grounds. Vessels may anchor only within the following limits:

(1) Northward of a line bearing 54° true and extending from a point on Passmore's wharf in prolongation with the north side of Commerce Street, Bath, Maine, to a point on the shore in Woolwich, approximately 1,200 feet north of the Maine Central Railroad wharf.

(2) Southward of a line drawn from the derrick on the Bath Iron Works wharf to Sassanoa Point in Woolwich.

(b) The regulations. (1) Vessels in the north anchorage shall be so anchored as to leave a clear fairway of 150 feet channelward of the established harbor lines at Bath, and a clear fairway 200 feet from the east or Woolwich shore, for the passage of steamers, tows, rafts, and other watercraft.

(2) The launching of vessels into the waters between the anchorages or the bringing up of such vessels by their anchors will be permitted: Provided, That the vessels so launched shall be removed therefrom within 12 hours from the time of anchorage.

§ 202.132 Portland Harbor, Maine—(a) The anchorage grounds—(1) Anchorage A (general). Beginning at the eastern corner of Grand Trunk Railway Company pier No. 3; thence approximately 90°, 1,700 yards, to Brooklyn Ledge Buoy 16; thence 330°, 350 yards; thence 25°, 780 yards; thence 303°, 750 yards; thence 254°, 560 yards; thence 186°, 750 yards; and thence to the point of beginning.

(2) Anchorage B (general and quarantine). Beginning at Brooklyn Ledge Buoy 16; thence 58° to little Diamond Island; thence along the southwestern shore to the pier on the southern end of Little Diamond Island; thence 143°, 1,200 yards; thence 270° to House Island Light; thence along the western shore of House Island to Fort Scammel Point Light; and thence 329°, 1,620 yards, to the point of beginning.

(3) Anchorage C. Bounded on the northwest by House Island; on the north by a line running 90° from House Island Light to Peak Island; on the east by the western shore of Peak Island, by a line running 198° from the westernmost point on Peak Island to Cushing Island, and by the shore of Cushing Island to its westernmost point; and on the southwest by a line running from the westernmost point on Cushing Island to Fort Scammel Point Light.

(4) Anchorage D. Southerly and westerly of a line beginning at Lighthouse Channel Buoy 1; thence 35° to Anchorage Buoy E; and thence 145° to the mainland.

(b) The regulations. (1) Anchorage B is intended for general purposes, but especially for use by oil tankers and other large deep-draft ships entering harbor at night and intending to proceed to the dock allotted at daylight the following morning or as soon as practicable. This area is also to be used for quarantine anchorage. Vessels must be so anchored in this area as to leave at all times an open usable channel at least 100 feet wide for passage of ferry and other boats between Portland, Peak Island, and Bay Points. Any vessels anchored in this area shall be ready to move on short notice when ordered to do so by the Captain of the Port.

(2) Anchorage C is intended for use only by small vessels and for temporary anchorage.

(3) Anchorage D is for use only by small yachts and pleasure craft and small light-draft coastwise freighters.

§ 202.134 Boston Harbor, Mass.—(a) The anchorage grounds—(1) Bird Island Anchorage. Beginning at a point bearing 93°, 1,400 yards, from the aerial beacon on top of the Boston Custom House tower; thence to a point bearing 81°, 1,600 yards, from the aerial beacon on top of the Boston Custom House tower; thence to a point bearing 102°, 3,100 yards, from the aerial beacon on top of the Boston Custom House tower; thence to a point bearing 109°, 3,050 yards, from the aerial beacon on top of the Boston Custom House tower; and thence to the point of beginning.

(2) President Roads Anchorage. Beginning at a point bearing 261°, 350 yards, from Deer Island Light; thence to a point bearing 261°, 2,900 yards, from Deer Island Light; thence to a point bearing 272°, 2,600 yards, from Deer Island Light; thence to a point bearing 319°, 650 yards, from Deer Island Light; and thence to the point of beginning.

(3) Long Island Anchorage. East of Long Island, bounded as follows: Beginning at the southwesternmost point of Gallups Island; thence 270° to Long Island; thence southerly along the eastern shore line of Long Island to Bass Point; thence to the northernmost point of Rainsford Island; thence to Georges Island Gong Buoy 6; and thence to the point of beginning.

(4) Castle Island Anchorage. Bounded on the north by Castle Island and adjacent land; on the east by a line between Castle Rocks Fog Signal Light and Old Harbor Shoal Buoy 2; on the southeast by a line between Old Harbor Shoal Buoy 2 and Old Harbor Buoy 4; and on the west by a line running due north from Old Harbor Buoy 4 to the shore line at City Point.

(5) Explosives anchorage. In the lower harbor, bounded on the northeast by a line between the northeast end of Peddocks Island and the northeast end of Rainsford Island; on the northwest by Rainsford Island; on the southwest by a line between the western extremity of Rainsford Island and the westernmost point of Peddocks Island; and on the southeast by Peddocks Island.

(b) The regulations. (1) The Captain of the Port may authorize the use of the President Roads Anchorage as an explosives anchorage when he finds that the interests of commerce will be promoted and that safety will not be prejudiced thereby. Vessels anchored in this area shall move promptly upon notification by the Captain of the Port.

(2) In the Long Island Anchorage vessels shall anchor in the position designated by the Captain of the Port.

(3) Floats or buoys for marking anchors or moorings in place will be allowed in all areas. Fixed mooring piles or stakes are prohibited.

PART 203—BRIDGE REGULATIONS:

§ 203.1 General. Drawbridges across navigable waters of the United States will not be opened to navigation for certain periods determined to be in the interests of public safety by the proper civil defense authorities during a major disaster or civil defense emergency indicated by a civil defense condition of "Air Raid Warning" (attack by enemy aircraft probable, imminent, or taking place) notwithstanding any general or special regulations heretofore or hereafter prescribed for the operation of any such drawbridge or drawbridges.

§ 203.2 Machias River, Maine; East Machias Highway Bridge between Machiasport and East Machias, Maine.—(a) The draw shall be opened promptly on signal for the passage of vessels between the hours of 7:00 a.m. and 5:00 p.m. (local time) throughout the year.

(b) At times other than those specified in paragraph (a) of this section, the draw need not be opened for the passage of vessels, except on advance notice to the drawtender to be given between the hours of 7:00 a.m. and 5:00 p.m. when the drawtender is on duty.

(c) The owner or agency controlling the bridge shall keep conspicuously posted on both the upstream and downstream sides of the bridge, in a position where it can be easily read at any time, a copy of the regulations in this section.

§ 203.2a Narraguagus River, Maine; Maine State Highway Commission bridge across Narraguagus River, Milbridge, Maine. (a) The owner of or agency controlling the drawbridge will not be required to keep a drawtender in constant attendance.

(b) Whenever a vessel desires an opening of the drawspan at least a 24-hour advance notice of the time the opening is required shall be given in person, in writing, or by telephone to the Maine State Highway Commission, Division Office, Ellsworth, Maine.

(c) Upon receipt of such notice, the authorized representative of the owner of or agency controlling the bridge in compliance therewith, shall arrange for the prompt opening of the draw at the time specified in the notice for the passage of the vessel.

(d) The owner of or agency controlling the bridge shall keep conspicuously posted on both the upstream and downstream sides of the bridge, in a manner that it can be easily read at any time, a copy of the regulations in this section, together with a notice stating exactly how the representative stated in paragraph (b) of this section may be reached.

§ 203.3 Taunton River, Maine; Maine State Highway Commission highway bridge between Hancock and Sullivan. (a) The owner of or agency controlling this bridge will not be required to keep draw tenders in constant attendance.

(b) Whenever a vessel unable to pass under the closed bridge desires to pass through the draw, at least 48 hours' advance notice of the time the opening is required shall be given to the authorized representative of the owner of or agency controlling the bridge, except as provided in paragraph (c) of this section. Advance notice as required by this paragraph shall be given either in person, by telephone, or otherwise to the Maine State Highway Commission, Augusta, Maine, or Ellsworth, Maine, or to such person or persons as may be designated an authorized representative.

(c) In case of emergency, the draw shall be opened promptly upon notification. For this purpose the owner of or agency controlling the bridge shall provide arrangements whereby the draw tender can be readily reached by telephone or otherwise at any hour of the day or night.

(d) Upon receipt of such notice, the authorized representative of the owner of or agency controlling the bridge, in compliance therewith, shall arrange for the prompt opening of the draw, at the time specified in the notice for the passage of the vessel.

(e) The owner of or agency controlling the bridge shall keep conspicuously posted on both the upstream and downstream sides of the bridge, in such manner that it can be easily read at any time, a copy of the regulations in this section, together with a notice stating exactly how the draw tender may be reached in an emergency and how the authorized representative may be reached by telephone or otherwise.

(f) The operating machinery of the draw shall be maintained in a serviceable condition, and the draw shall be opened and closed at intervals frequent enough to make certain the machinery is in proper order for satisfactory operation.

§ 203.4 Mount Desert Narrows, Maine; highway bridge between the mainland and Thompson Island at Trenton, Maine. (NOTE: former swing span bridge replaced by fixed bridge; regulation no longer applicable.)

§ 203.5 Townsend Gut, Maine; bridge (highway) of town of Southport. (a) That the draw of the bridge shall be opened promptly upon reasonable signal for the passage of boats except when there are vehicles, animals, or foot passengers on the bridge; but in no case shall the delay in opening the bridge from this cause exceed five minutes: Provided, That the signal may be given by three distinct blasts of whistle, horn, or conch, or by shouting with the voice.

(b) All boats desiring to pass through the draw shall be allowed to do so freely and without interference at a speed not exceeding 5 knots per hour.

§ 203.6 Back River, Maine; highway bridge between Hodgdon and Barter Islands in the Town of Boothbay, Maine. (a) The draw shall be opened promptly on signal for the passage of vessels between the hours of 8:00 a.m. and 5:00 p.m. (local time) during the months of June to October, inclusive. At other hours during these months the draw need not be opened for the passage of vessels except on previous notice in person, by telephone, or in writing to the drawtender. Such previous notice to be received during the hours the drawtender is on duty.

(b) From November to May, inclusive, the draw need not be opened for the passage of vessels any hour of the day or night except on a 24-hour advance notice to the drawtender of the bridge over Townsend Gut between Southport and Boothbay Harbor, Maine, or to the Maine State Highway Commission, Augusta, Maine.

(c) Upon receipt of such notice, the authorized representatives of the owner or agency controlling the bridge, in compliance therewith, shall arrange for the opening of the draw at the time specified in the notice for the passage of the vessel.

(d) The owner or agency controlling the bridge shall keep conspicuously posted on both the upstream and downstream sides of the bridge, in a manner that it can be easily read at any time, a copy of the regulations in this section, together with a notice stating exactly how the representative stated in paragraph (b) of this section may be reached.

§ 203.8 Kennebec River, Maine; Maine State Highway Commission highway and railroad bridge (Carlton Bridge) between Bath and Woolwich. (a) The owner of or agency controlling this bridge shall provide the necessary draw tenders and the proper mechanical appliances for the safe, prompt, and efficient opening of the draw for the passage of vessels.

(b) The draw shall, upon receiving the prescribed call signal, be opened promptly at any time, day or night, for the passage of any vessel or other watercraft not able to pass under the closed bridge: Provided, That the draw shall not be opened when a train is approaching so closely that it cannot safely be stopped before reaching the bridge, or when a passenger or mail train is approaching within sight or hearing of the draw tender.

NOTE: If it is desired to give advance notice of the approximate time an opening will be required, the draw tender may be reached by telephone at any time. The telephone number is Bath 73.

(c) Sound and visual signals: Both sound and visual signals shall be given together under any weather conditions and whether sound signals can or cannot be heard.

(1) Call signal for opening of draw. Three blasts or three loud and distinct strokes of a bell, and a flag by day or a lighted lantern at night swung in circles at arm's length from the bridge or pilot house of the vessel. The call signal shall be given when the vessel is within a reasonable distance of the bridge, and shall be repeated at intervals until acknowledged.

(2) Acknowledging signals when draw can be opened immediately and is in process of being lifted. Flashing yellow light and whistle in series of three flashes and blasts with four seconds between each series, to be continued until confirmed. The vessel shall confirm by three blasts or three loud and distinct strokes of a bell, and a flag by day or a lighted lantern at night raised and lowered in vertical plane a number of times.

(3) Acknowledging signals when draw cannot be opened immediately. Flashing red light and whistle in series of five flashes and blasts with five seconds between each series, to be continued until confirmed. The vessel shall confirm by five blasts or five loud and distinct strokes of a bell, and a flag by day or a lighted lantern at night swung to and fro horizontally a number of times.

NOTE: As used in this paragraph, the term "blasts" means distinct blasts of a whistle, horn, or megaphone each of one second's duration and at one-second intervals. The flashing yellow and red lights referred to will be located on the west side of the river on the upstream and

downstream sides of the bridge near the operator's house at a height of about 75 feet above mean high water.

(d) Trains and vehicles shall not be stopped on the bridge for the purpose of delaying its opening, nor shall watercraft be handled so as to hinder or delay the operation of the draw, but all passage over or through the bridge shall be prompt to prevent delay to either land or water traffic.

(e) The owner of or agency controlling the bridge shall keep conspicuously posted on both the upstream and downstream sides thereof, in such manner that it can be read easily at any time, a copy of the regulations in this section.

§ 203.10 Kennebec River, Maine; Maine State Highway Commission bridges between Richmond and Dresden and between Gardiner and Randolph. (a) The owner of or agency controlling these bridges shall provide the necessary draw tenders and the proper mechanical appliances for the safe, prompt, and efficient opening of the draws for the passage of vessels.

(b) The draw of each bridge shall, upon receiving the prescribed call signal, be opened promptly at any time, day or night, for the passage of any vessel or other watercraft not able to pass under the closed bridge: Provided, That the draw shall not be required to be opened between 9:00 p.m. and 5:00 a.m. except when advance notice of the time an opening is desired is given to the draw tender in person or by telephone or letter. The owner of or agency controlling the bridges shall provide arrangements whereby the draw tenders can be readily reached by telephone or otherwise at any time between 5:00 a.m. and 9:00 p.m. Notices stating exactly how the draw tender may be reached shall be posted in the same manner as the copies of the regulations posted in accordance with paragraph (e) of this section.

(c) Sound and visual signals: Both sound and visual signals shall be given together under any weather conditions and whether sound signals can or cannot be heard.

(1) Call signal for opening of draw. Three blasts, and a flag by day or a lighted lantern by night swung in circles at arm's length from the bridge or pilot house of the vessel. The call signal shall be given when the vessel is within a reasonable distance of the bridge, and shall be repeated at intervals until acknowledged.

(2) Acknowledging signals when draw can be opened immediately. Three blasts, and a flag by day or a lighted lantern at night raised and lowered in vertical plane a number of times.

(3) Acknowledging signals when draw cannot be opened immediately. Five blasts, and a flag by day or a lighted lantern at night swung to and fro horizontally a number of times.

NOTE: As used in this paragraph, the term "blasts" means distinct blasts of a whistle, horn, or megaphone, or loud and distinct stroke of a bell.

(d) Vehicles shall not be stopped on a bridge for the purpose of delaying its opening, nor shall watercraft be handled so as to hinder or delay the operation of the draw, but all passage over or through a bridge shall be prompt to prevent delay to either land or water traffic.

(e) The owner of or agency controlling the bridges shall keep conspicuously posted on both the upstream and downstream sides of each, in such manner that it can be read easily at any time, a copy of the regulations in this section.

§ 203.15 Presumpscot River, Portland, Maine; bridge (highway) at Martins Point, Portland, Maine. (a) That on week days between April 1 and November 30 the draw shall be opened promptly upon signal between the hours of 7 a.m. and 6 p.m. Between December 1 and March 31 and on holidays and Sundays throughout the year the draw shall be opened only upon timely previous notice in person or in writing or by telephone to the draw tender.

(b) That the signal for opening the draw shall be five blasts of steam whistle on steam vessels or towboats, and five blasts from a horn on sailing or gasoline-driven vessels.

(c) That boats and tows shall approach and pass through the draw at a speed no higher than that required for good steerage way.

(d) This section shall take effect and be in force on and after August 15, 1922.

§ 203.20 Back Cove, Portland Harbor, Maine; bridge (highway), known as "Tukeys Bridge," of city of Portland. (NOTE: Swing span inoperative; fixed bridge under construction to replace it.)

§ 203.25 Fore River, Portland Harbor, Maine; bridges (highway), known as "Portland Bridge" and "Vaughan Bridge." (NOTE: Vaughan drawbridge removed; regulation no longer applicable to it.) (a) The corporations or persons owning or controlling a drawbridge shall provide the same with the necessary tenders and the proper mechanical appliances for the safe, prompt, and efficient opening of the draw for the passage of vessels.

(b) If the weather conditions are good and sound signals can be heard when a vessel approaches a drawbridge and desires to pass through the draw, three distinct blasts of a whistle, horn, or megaphone shall be sounded from the vessel when within reasonable hearing distance of the bridge.

(1) When the draw of the bridge can be opened immediately, the draw tender shall reply by three distinct blasts of a whistle, horn, or megaphone or by three loud and distinct strokes of a bell.

(2) When the draw of the bridge cannot be opened immediately or when the bridge is open and is to be closed immediately, the draw tender shall reply by two long distinct blasts of a whistle, horn, or megaphone or by two loud and distinct strokes of a bell.

(c) When weather conditions prevent hearing the sound signals when a vessel approaches a drawbridge

and desires to pass through the draw, signals shall be made from the vessel by swinging in circles at arm's length a lighted lantern at night and a flag by day.

(1) When the draw of the bridge can be opened immediately, the draw tender shall reply by raising and lowering in a vertical plane a number of times a lighted lantern at night and a flag by day.

(2) When the draw of the bridge cannot be opened immediately or when the bridge is to be closed immediately, the draw tender shall reply by swinging to and fro horizontally a number of times a lighted lantern at night and a flag by day.

(d) When two or more vessels are approaching a bridge at nearly the same time from the same or opposite directions with the draw opened or closed, each of these vessels shall signal independently for the opening of the draw, and the draw tender shall reply as prescribed and in turn to the signal of each vessel.

(e) The draw shall be opened with the least possible delay at all hours upon receiving the prescribed signal for the passage of any vessel or vessels or other watercraft not able to pass underneath it.

(f) When a bridge tender is about to close a draw, he shall sound two distinct blasts of a whistle, horn, or megaphone, or two loud and distinct strokes of a bell.

(g) Wagons and other vehicles shall not be stopped on a drawbridge for the purpose of delaying its opening, nor shall water craft or vessels be so manipulated as to hinder or delay the operation of a drawspan, but all passage over, through, or under a drawbridge shall be prompt, to prevent delay to either land or water traffic.

(h) The owners of the Portland Bridge shall provide and keep in good legible condition two board gages painted white, with black figures not less than 6 inches high, to indicate the headroom clearance under the lower chords of the closed drawspan at all stages of the tide. The gages shall be so placed on the ends of the drawspan fender that they will be plainly visible to the operator of a vessel approaching the bridge either upstream or downstream, and the said gages shall be illuminated at night.

(i) Vessels which can pass under Portland Bridge with a clearance of 2 feet or more should not signal for the opening of the draw. In case such a vessel gives the prescribed signal and the draw tender is uncertain as to whether the vessel can safely pass, he will open the draw and if he finds that there would have been a clearance of 2 feet or more had the draw remained closed, he will report the matter immediately to the district engineer, United States Engineer Office, Boston, Mass., giving the name of the vessel, the time of opening the draw, the headroom under the bridge as indicated by the gage at the time of opening the draw, and the approximate headroom required by the vessel.

(j) This section shall be in force on and after April 15, 1930, and shall supersede those prescribed February 23, 1910, and April 13, 1918.

§ 203.28 Kennebunk River, Maine, Dock Square Highway Bridge between Kennebunk and Kennebunkport, Maine. (a) The draw shall be opened promptly on signal for the passage of vessels between the hours of 7:00 a.m. and 5:00 p.m. (local time) on all days of the year.

(b) At times other than those specified in paragraph (a) of this section, the draw need not be opened for the passage of vessels except on advance notice to the drawtender to be given between the hours of 7:00 a.m. and 5:00 p.m. when the drawtender is on duty.

(c) The owner or agency controlling the bridge shall keep conspicuously posted on both the upstream and downstream sides of the bridge, in a position where it can be easily read at any time, a copy of the regulations in this section.

§ 203.30 York River, Maine; bridge (highway) of town of York, between York and Johnny Island. (NOTE: former drawbridge replaced by fixed bridge; regulation no longer applicable.)

§ 203.35 Piscataqua River, Maine and N.H.—(a) Bridge (highway) between Portsmouth, N.H., and Kittery, Maine. (1) The draw shall, upon the signals prescribed in subparagraphs (2) and (3) of this paragraph being given, be opened promptly at all hours for the passage of any vessel or vessels or other watercraft not able to pass underneath it.

(2) The signal for opening the draw shall be four blasts of a whistle or horn.

(3) Upon receiving the prescribed signal from an approaching vessel or watercraft, the draw tender, in case the draw can be opened immediately, shall promptly reply by an answering signal of three blasts of a whistle or horn. If, for any reason, the draw cannot be opened promptly when the prescribed signal is given, the draw tender shall so indicate by sounding five blasts of a whistle or horn, repeated at intervals until answered in like manner by the approaching vessel.

(4) There shall be provided, and kept in good legible condition, two board gages, painted white, with black figures not less than 6 inches high, to indicate the headroom clearance under the lower chords of the closed drawspan at all stages of the tide. The gages shall be so placed on the piers at the ends of the drawspan, that they will be plainly visible to the operator of a vessel approaching the bridge either upstream or downstream.

(5) Pedestrians and vehicles shall not be stopped on the bridge for the purpose of delaying its opening, nor shall watercraft or vessels be so manipulated as to hinder or delay the operation of a drawspan, but all passage over, through, or under a drawbridge shall be prompt, to prevent delay to either land or water traffic.

(6) The rules and regulations in this paragraph shall be in force on and after December 1, 1929, and shall supersede regulations approved June 27, 1923, for the above-mentioned bridge.

(b) Bridge (combined highway and railroad) between Portsmouth, N.H., and Kittery, Maine. (1) The corporation or persons owning or controlling this drawbridge shall provide the same with the necessary tenders and

the proper mechanical appliances for the safe, prompt, and efficient opening of the draw for the passage of vessels.

(2) If the weather conditions are good and sound signals can be heard when a vessel approaches this drawbridge and desires to pass through the draw, two long and two short distinct blasts of a whistle, horn, or megaphone shall be sounded from the vessel when within reasonable hearing distance of the bridge.

(i) When the draw of the bridge can be opened immediately, the draw tender shall reply by two long distinct blasts of a whistle, siren, horn, or megaphone or by two loud and distinct strokes of a bell.

(ii) When the draw of the bridge cannot be opened immediately or when the bridge is open and is to be closed immediately, the draw tender shall reply by five short distinct blasts of a whistle, siren, horn, or megaphone or by five loud and distinct strokes of a bell, repeated at intervals until answered in like manner from the approaching vessel.

(3) When weather conditions prevent hearing the sound signals when a vessel approaches this drawbridge and desires to pass through the draw, signals shall be made from the vessel by swinging in circles at arm's length, a lighted lantern at night and a flag by day.

(i) When the draw of the bridge can be opened immediately, the draw tender shall reply by raising and lowering in a vertical plane a number of times, a lighted lantern at night and a flag by day.

(ii) When the draw of the bridge cannot be opened immediately or when the bridge is to be closed immediately, the draw tender shall reply by swinging to and fro horizontally a number of times a lighted lantern at night and a flag by day.

(4) When two or more vessels are approaching this bridge at nearly the same time from the same or opposite directions with the draw opened or closed, each of these vessels shall signal independently for the opening of the draw, and the draw tender shall reply as prescribed and in turn to the signal of each vessel.

(5) The draw shall be opened with the least possible delay at all hours upon receiving the prescribed signal for the passage of any vessel or vessels or other watercraft not able to pass underneath it: Provided, That the drawspan shall not be opened when a train is approaching so closely that it cannot safely be stopped before reaching the railroad signal block in which the drawspan of the bridge is located.

(6) When the draw tender is about to close the draw, he shall sound one distinct blast of a whistle, siren, horn or megaphone, or one loud and distinct stroke of a bell.

(7) Trains and vehicles shall not be stopped or pedestrians loiter on this drawbridge for the purpose of delaying its opening, nor shall watercraft or vessels be so manipulated as to hinder or delay the operation of the drawspan, but all passage over, through, or under it shall be prompt, to prevent delay to either land or water traffic.

(8) The owners of this bridge shall provide and keep in good legible condition two suitable gages approved by the U.S. District Engineer, Boston, Massachusetts, to indicate the headroom clearance under the lower chords of the closed drawspan at all stages of the tide. These gages shall be so placed on the piers at the ends of the drawspan that they will be plainly visible to the operator of a vessel approaching the bridge either upstream or downstream.

(9) The regulations in this paragraph shall take effect and be in force on and after November 18, 1940.

§ 203.40 Bellamy River, N.H.; bridge (highway) between Cedar Point and Dover Point, N.H. (a) The owner of or agency controlling the bridge will not be required to keep draw tenders in constant attendance at the bridge.

(b) Whenever a vessel unable to pass under the closed bridge desires to pass through the draw between the hours of 6:00 a.m. and 10:00 p.m., from April 1 to October 31, at least 4 hours' advance notice of the time the opening is required shall be given to the authorized representative of the owner or agency controlling the bridge: Provided, That in an emergency the draw will be opened as soon as possible after notification. At all other hours during the period April 1 to October 31 and at all times during the period November 1 to March 31, the draw will be opened only in an emergency. The owner of or agency controlling the bridge shall provide arrangements whereby the draw tenders can be readily reached by telephone or otherwise at any hour of the day or night.

(c) Upon receipt of such notice, the authorized representative of the owner of or agency controlling the bridge, in compliance therewith, shall arrange for the prompt opening of the draw at the time specified in the notice for the passage of the vessel.

(d) The owner of or agency controlling the bridge shall keep conspicuously posted on both sides of the bridge, in a position where it can easily be read at any time, a copy of the regulations in this section, together with a notice stating exactly how the representative specified in paragraph (b) of this section may be reached.

(e) Automobiles, trucks, vehicles, vessels or other water craft shall not be stopped or manipulated in a manner hindering or delaying the operation of the draw. All passage over the draw or through the draw opening shall be in a manner to expedite both land and water traffic.

(f) The operating machinery of the draw shall be maintained in serviceable condition, and the draw opened and closed at least once each quarter to make certain that the machinery is in proper order for satisfactory operation.

(g) This section shall take effect and be in force on and after October 17, 1935.

§ 203.45 Exeter River, N.H.; Boston and Maine Railroad bridge and State of New Hampshire Highway Department bridge. (NOTE: These bridges changed to fixed bridges; regulation no longer applicable.)

§ 203.48 Little Harbor, N.H.; bridge (highway) between Rye and New Castle, N.H. (a) The owner or agency controlling the bridge will not be required to keep draw tenders in constant attendance at the bridge.

(b) Whenever a vessel unable to pass under the closed bridge desires to pass through the draw between the hours of 6:00 a.m. and 10:00 p.m., from April 1 to October 31, at least 4 hours' advance notice of the time the opening is required shall be given to the authorized representative of the owner or agency controlling the bridge: Provided, That in an emergency the draw will be opened as soon as possible after notification. At all other hours during the period April 1 to October 31 and at all times during the period November 1 to March 31, the draw will be opened only in an emergency. The owner of or agency controlling the bridge shall provide arrangements whereby the draw tenders can be readily reached by telephone or otherwise at any hour of the day or night.

(c) Upon receipt of such notice, the authorized representative of the owner or agency controlling the bridge, in compliance therewith, shall arrange for the prompt opening of the draw at the time specified in the notice for the passage of the vessel.

(d) The owner or agency controlling the bridge shall keep conspicuously posted on both sides of the bridge, in a position where it can easily be read at any time, a copy of the regulations of this section, together with a notice stating exactly how the representative specified in paragraph (b) of this section may be reached.

(e) Automobiles, trucks, vehicles, vessels, or other watercraft shall not be stopped or manipulated in a manner hindering or delaying the operation of the draw. All passage over the draw or through the draw opening shall be in a manner to expedite both land and water traffic.

(f) The operating machinery of the draw shall be maintained in a serviceable condition, and the draw opened and closed at least once each quarter to make certain that the machinery is in proper order for satisfactory operation.

(NOTE: In 1959 the draw was manually operated.)

§ 203.50 Hampton River, N.H.; bridge (highway) between Seabrook and Hampton Beaches, N.H. (a) The owner of or the agency controlling the drawbridge shall provide the appliances and the personnel necessary for the safe, prompt, and efficient operation of the draw.

(b) The draw shall be operated as prescribed in paragraphs (c) and (d) of this section and shall be opened promptly when the signal prescribed in paragraph (i) of this section for the opening of the draw is received.

(c) On all week days between April 1 and October 31, both dates inclusive, the draw shall be opened promptly for the passage of vessels during the daylight portions of the periods beginning 3 hours before and ending 3 hours after each high water. For the purpose of this section, daylight is construed to begin 30 minutes before sunrise and to end 30 minutes after sunset, and high water shall be deemed to occur 30 minutes later than the time of high water for Portland, Me., as given in the tide tables for the United States published by the Department of Commerce, United States Coast and Geodetic Survey.

(d) At times other than those specified in paragraph (c) of this section, the draw shall be opened only upon at least 3 hours' previous notice given in person or in writing or by telephone to the representative of the owner or agency controlling the bridge except that in case of emergency the draw shall be opened promptly upon such notice. For this purpose the owner shall install and maintain at the bridge a telephone and shall keep conspicuously posted on both the upstream and downstream sides of the bridge in such manner that it can easily be read at any time a copy of the regulations in this section together with a notice stating exactly how the representative specified in this section may be reached.

(e) The owners of the bridge shall provide and keep in good legible condition two board gages painted white, with black figures not less than 6 inches high, to indicate the headroom clearance under the closed drawspan at all stages of the tide. The gages shall be so placed on the bridge that they will be plainly visible to the operator of a vessel approaching the bridge either up or down stream.

(f) Vessels which can pass under the bridge with a clearance of 1 foot or more should not signal for the opening of the draw. In case such a vessel gives the prescribed signal and the draw tender is uncertain as to whether the vessel can safely pass, he will open the draw and if he finds that there would have been a clearance of 1 foot or more had the draw remained closed, he will report the matter immediately to the District Engineer, United States Engineer Office, Boston, Mass., giving the name of the vessel, the time of opening the draw, the headroom under the bridge as indicated by the gage at the time of opening the draw, and the approximate headroom required by the vessel.

(g) Pilots or masters of vessels are prohibited from signaling for or serving notice of passage unless it is necessary for the draw to be opened for the passage of the vessel. If notice or signal is given and the passage not effected at the proper time, report shall be made to the District Engineer, United States Engineer Office, Boston, Mass., by the draw tender.

(h) Automobiles, trucks, vehicles, vessels or other water craft shall not be stopped or manipulated in a manner hindering or delaying the operation of the draw, but all passage over the drawspan or through the draw opening shall be in a manner so as to expedite both land and water traffic.

(i) Signals—(1) Call signals for opening of draw—(i) Sound signal. Three distinct blasts of a whistle, horn, or megaphone, or three loud and distinct strokes of a bell sounded within a reasonable hearing distance of the bridge.

(ii) Sight signal. A white flag by day, a white light by night, swung in full circles at arm's length in full sight of the bridge and facing the draw. This signal is to be used in conjunction with sound signals when conditions are such that sound signals may not be heard.

(2) Acknowledging signals by bridge operator—(i)

Sound signals. Draw to be opened immediately: Same as call signal. Draw cannot be opened immediately, or if open must be closed immediately: Two long distinct blasts of a whistle, horn, or megaphone or by two loud and distinct strokes of a bell, to be repeated at regular intervals until acknowledged by the vessel.

(ii) Sight signals. Draw to be opened immediately: A white flag by day or a green light at night swung up and down vertically a number of times in full sight of the vessel. Draw cannot be opened immediately or if open must be closed immediately: A red flag by day, a red light by night swung to and fro horizontally in full sight of the vessel, to be repeated until acknowledged by the vessel.

(3) Acknowledging signals by the vessel. Vessels or other water craft having signaled for the opening of the draw and having received a signal that the draw cannot be opened immediately, or if open must be closed immediately, will acknowledge said signal by one long blast followed by a short blast, or by swinging to and fro horizontally a red flag by day or a red light by night.

(j) This section shall be in force on and after October 31, 1932.

§ 203.55 Merrimack River, Mass.—(a) Massachusetts Department of Public Works highway bridge and Boston and Maine Railroad bridge between Newburyport and Salisbury. (1) Between 6:00 a.m. and 10:00 p.m. from May to October, inclusive, and between 8:00 a.m., and 5:00 p.m. from November to April, inclusive, the draw of each of these bridges shall, upon receipt of the signal prescribed in subparagraph (5) of this paragraph or upon verbal request at the bridge, be opened promptly for the passage of any vessel or other watercraft not able to pass under the closed draw.

(2) At all other times, the draw shall be opened within a reasonable time after notice to the draw tender in person, by letter, or by telephone. For this purpose the owner of or agency controlling the bridge shall provide arrangements whereby the draw tender can be reached readily by telephone or otherwise at any hour of the day or night, and shall keep conspicuously posted on both the upstream and downstream sides of the bridge, in a position where it can be read easily at any time, a copy of the regulations in this paragraph together with a notice stating exactly how the draw tender may be reached at all times by telephone or otherwise.

(3) The draw shall not be opened if there is a train, car, or other vehicle passing over the draw, or if a train or car is approaching so closely that it cannot be stopped safely before reaching the draw, but the draw shall be opened as soon as it can be cleared, and no person, vehicle, car, or train shall be permitted to begin to cross the draw after it has been signaled to open except as provided in this paragraph.

(4) When the draw shall have been opened for 10 minutes it may be closed for the crossing of trains, cars, vehicles, or individuals if there be any waiting to cross, and after being so closed for 10 minutes or for such shorter time as may be necessary for the said trains, cars, vehicles, or individuals to cross, it shall again be opened promptly for the passage of any vessel or other watercraft desiring to pass. The length of time that the draw has been open shall be computed from the time it is fully opened, and the length of time that the draw has been closed shall be computed from the time it ceases to move in closing.

(5) When a vessel or other watercraft intends to pass through the draw of either bridge, the master or pilot thereof shall, on approaching within signaling distance, signify his intention to pass through the draw by sounding two long blasts followed immediately by two short blasts. If the draw can be opened immediately, the draw tender shall reply by three long blasts. If a delay in opening the draw is permitted by the regulations in this paragraph and it is not to be opened immediately, the draw tender shall reply by two long blasts.

NOTE: As used in this paragraph, the term "long blasts" means distinct blasts of a whistle or horn of three second's duration, and the term "short blasts" means distinct blasts of a whistle or horn of one second's duration.

(6) Trains and vehicles shall not be stopped on a bridge for the purpose of delaying its opening, nor shall watercraft be navigated so as to hinder or delay the operation of the draw, but all passage over or through the bridge shall be prompt to prevent delay to either land or water traffic.

(7) The owner of or agency controlling each bridge shall maintain in good and efficient order the draw and the machinery and appliances for operating the same and for assisting vessels while passing through the draw, shall provide such draw tenders as may be necessary to open and close the draw promptly, and shall provide and maintain in good order on the bridge piers or fenders such fixtures as may be necessary to vessels in mooring or making fast while waiting for the draw to open.

(8) This paragraph shall not apply to vessels owned or leased by the United States, nor to vessels employed for police or fire protection by any town or municipality touching on the Merrimack River. All such United States and municipal vessels shall be passed without delay through the draw of either bridge during the periods specified in subparagraph (1) of this paragraph upon signaling by four long blasts, and at all other times as soon as possible after notice to the draw tender in person or by telephone.

(b) Essex County highway bridge between Deer Island and Salisbury and drawbridges upstream therefrom. (1) The owner of or agencies controlling these bridges will not be required to keep draw tenders in constant attendance.

(2) Whenever a vessel unable to pass under a closed bridge desires to pass through the draw, at least two hours' advance notice of the time the opening is required shall be given to the authorized representative of the owner of or agency controlling the bridge: Provided, That all vessels owned or leased by the United States, and all vessels employed for police or fire protection by any town or municipality touching on the Merrimack River, shall be passed through the draw as soon as pos-

sible after notice to the authorized representative in person or by telephone.

(3) Upon receipt of such advance notice, the authorized representative, in compliance therewith, shall arrange for the prompt opening of the draw at the time specified in the notice for the passage of the vessel.

(4) The owner of or agency controlling each bridge shall keep conspicuously posted on both the upstream and downstream sides thereof, in such manner that it can be read easily at any time, a copy of the regulations in this paragraph together with a notice stating exactly how the authorized representative may be reached.

(5) The operating machinery of the draws shall be maintained in a serviceable condition, and the draws shall be opened and closed at intervals frequent enough to make certain that the machinery is in proper order for satisfactory operation.

§ 203.60 Plum Island River, Mass.; bridge (highway). (a) The owner of or the agency controlling the drawbridge shall provide the appliances and the personnel necessary for the safe, prompt, and efficient operation of the draw.

(b) On every calendar day between April 1 and November 30, both dates inclusive, the draw shall be opened promptly for the passage of vessels during the daylight portions of the periods beginning 2 hours before and ending 2 hours after each high tide. For the purpose of this section, daylight is construed to begin 30 minutes before sunrise and to end 30 minutes after sunset, and high tide shall be deemed to occur 30 minutes later than the time of high tide for Portland, Maine, as given in the tide tables for the United States published by the Department of Commerce, United States Coast and Geodetic Survey.

(c) Persons requiring the opening of the draw at times other than those specified in paragraph (b) of this section shall, except in an emergency, give at least 3 hours' notice of the time at which such opening will be required. Said notice may be given in person, in writing, or by telephone to the draw tender while in attendance at the bridge or to a designated representative of the owner or agency controlling the bridge. Upon receipt of such notice said owner or agency shall cause a suitable draw tender to be on duty at the bridge at the time specified in the notice, and the bridge shall at such time and for a reasonable period thereafter be opened promptly for the passage of vessels.

(d) The owner of or agency controlling the bridge shall install and maintain at the bridge a telephone and shall keep conspicuously posted on both the upstream and downstream sides of the bridge in such manner that it can easily be read at any time a copy of the regulations in this section together with a notice stating exactly how the representative specified in this section may be reached.

(e) The owners of the bridge shall provide and keep in good legible condition two board gages painted white, with black figures not less than 6 inches high, to indicate the headroom clearance under the closed drawspan at all stages of the tide. The gages shall be so placed on the bridge that they will be plainly visible to the operator of a vessel approaching the bridge either up or down stream.

(f) Vessels which can pass under the bridge with a clearance of 1 foot or more should not signal for the opening of the draw. In case such a vessel gives the prescribed signal and the draw tender is uncertain as to whether the vessel can safely pass, he will open the draw, and if he finds that there would have been a clearance of 1 foot or more had the draw remained closed, he will report the matter immediately to the district engineer, United States Engineer Office, Boston, Mass., giving the name of the vessel, the time of opening the draw, the headroom under the bridge as indicated by the gage at the time of opening the draw, and the approximate headroom required by the vessel.

(g) Pilots or masters of vessels are prohibited from signaling for or serving notice of passage unless it is necessary for the draw to be opened for the passage of the vessel. If notice or signal is given and the passage not effected at the proper time, report shall be made to the District Engineer, United States Engineer Office, Boston, Mass., by the draw tender.

(h) Automobiles, trucks, vehicles, vessels or other water craft shall not be stopped or manipulated in a manner hindering or delaying the operation of the draw, but all passage over the drawspan or through the draw opening shall be in a manner so as to expedite both land and water traffic.

(i) Signals—(1) Call signals for opening draw—(i) Sound signal. Three distinct blasts of a whistle, horn, or megaphone, or three loud and distinct strokes of a bell sounded within a reasonable hearing distance of the bridge.

(ii) Sight signal. A white flag by day, a white light by night, swung in full circles at arm's length in full sight of the bridge and facing the draw. This signal is to be used in conjunction with sound signals when conditions are such that sound signals may not be heard.

(2) Acknowledging signals by bridge operator—(i) Sound signals. Draw to be opened immediately: Same as call signal. Draw cannot be opened immediately, or if open must be closed immediately: Two long distinct blasts of a whistle, horn, or megaphone or by two loud and distinct strokes of a bell, to be repeated at regular intervals until acknowledged by the vessel.

(ii) Sight signals. Draw to be opened immediately: A white flag by day or a green light at night swung up and down vertically a number of times in full sight of the vessel. Draw cannot be opened immediately or if open must be closed immediately: A red flag by day, a red light by night swung to and fro horizontally in full sight of the vessel, to be repeated until acknowledged by the vessel.

(3) Acknowledging signals by the vessel. Vessels or other water craft having signaled for the opening of the draw and having received a signal that the draw cannot be opened immediately, or if opened must be closed

immediately, will acknowledge said signal by one long blast followed by a short blast, or by swinging to and fro horizontally a red flag by day or a red light by night.

(j) This section shall be in force on and after December 15, 1932.

§ 203.65 Danvers River, Mass.; bridges (highway and railroad). (a) The corporations or persons owning or controlling the bridge shall provide the same with the necessary tenders and proper mechanical appliances for the safe, prompt, and efficient opening of the draw for the passage of vessels.

(b) The draw of each of the bridges shall, upon the signal prescribed in paragraphs (d) and (e) of this section being given, be opened promptly for the passage of vessels from 8:00 a.m. to 12:00 midnight each day of the year.

(c) Between 12:00 midnight and 8:00 a.m. each day of the year, the bridges shall be opened on advanced notice in person, or in writing, or by telephone to the draw tenders, either at the bridges during the time the operators are on duty or at the residences thereafter, except that in case of emergency, the draw shall be opened promptly upon notification. For this purpose, the bridge owners shall install and maintain telephones at the bridges and provide arrangements whereby the draw tenders can be reached by telephone or otherwise at any hour of the day or night, and notice of such arrangements shall be conspicuously posted on the bridges.

(d) If weather conditions are good and sound signals can be heard when a vessel approaches a drawbridge and desires to pass through the draw, the person in charge of said vessel shall cause to be sounded, within reasonable hearing distance of the bridge, three distinct blasts of a whistle, horn, or megaphone, or three loud and distinct strokes of a bell.

(1) When the draw of the bridge can be opened immediately, the draw tender shall reply by three distinct blasts of a whistle, horn, or megaphone, or by three loud and distinct strokes of a bell.

(2) When the draw of the bridge cannot be opened immediately, the draw tender shall reply by two long distinct blasts of a whistle, horn, or megaphone or by two loud and distinct strokes of a bell.

(e) When weather conditions prevent hearing the sound signals, signals shall be made from the vessel by swinging in circles at arm's length a flag.

(1) When the draw of the bridge can be opened immediately, the draw tender shall reply by raising and lowering in vertical plane a number of times a flag.

(2) When the draw of the bridge cannot be opened immediately, the draw tender shall reply by swinging to and fro horizontally a number of times a flag.

(f) The draw shall be opened with the least possible delay upon receiving the prescribed signals: Provided, That the drawspan shall not be opened when a train is approaching so closely that it cannot safely be stopped before reaching the bridge, or when a passenger or mail train is approaching within sight or hearing of the operator of the drawspan.

(g) Trains, wagons, and other vehicles shall not be stopped on a drawbridge for the purpose of delaying its opening, nor shall water craft or vessels be so manipulated as to hinder or delay the operation of a drawspan, but all passage over, through, or under a drawbridge shall be prompt, to prevent delay to either land or water traffic.

(h) This section shall be in force on and after August 1, 1928.

§ 203.75 Boston Harbor, Mass., and adjacent waters; bridges. (a) The regulations in this section shall govern the operation of all drawbridges across Boston Harbor, Massachusetts, including the following waters in and adjacent thereto:

(1) Chelsea River.

(2) Mystic River.

(3) Malden River (excluding the Massachusetts Department of Public Works highway bridge at Medford Street, Malden).

(4) Little Mystic Channel.

(5) Charles River.

(6) Fort Point Channel (excluding therefrom the portion of Fort Point Channel lying above the easterly side of the highway bridge at Dorchester Avenue).

(7) Reserved Channel.

(8) Neponset River.

(9) Weymouth Fore River

(10) Weymouth Back River.

(b) The owners of or agencies controlling the bridges shall provide the necessary tenders and the proper mechanical appliances for the safe, prompt, and efficient opening of the draws for the passage of vessels and for assisting vessels while passing through the draws. They shall also provide and maintain in good order on the bridge piers or fenders such fixtures as may be necessary to vessels in mooring or making fast while waiting for the draws to open.

(c) Except as otherwise provided in paragraphs (g) to (l) of this section, the draw of each bridge shall, upon oral request or upon receiving the prescribed call signal, be opened promptly for the passage of any vessel or other watercraft not able to pass under the closed bridge: Provided, That the draw shall not be opened when a train or vehicle is approaching so closely that it cannot safely be stopped before reaching the draw: Provided further, That when any draw shall have been open for 10 minutes or longer it may be closed to permit any waiting trains, vehicles, or persons to cross, and after being so closed for 10 minutes or for such shorter time as may be necessary it shall again be opened promptly for the passage of vessels or other watercraft if there be any such desiring to pass.

NOTE: The length of time a draw has been open shall be computed from the time that the draw begins to move in opening, and the length of time that a draw has been closed shall be computed from the time that the draw ceases to move in closing.

(d) Signals—(1) Call signal for opening of draw. Two long blasts followed immediately by two short blasts,

sounded within signaling distance of the bridge: Provided, That the call signal for the City of Boston bridge across Chelsea River connecting Meridian Street, East Boston, and Pearl Street, Chelsea, shall be two long blasts followed immediately by two short blasts and one long blast: Provided further, That the call signal for those bridges across Mystic River, Charles River, and Fort Point Channel referred to in paragraphs (g), (h), and (i) of this section, to be given by vessels entitled to passage during closed periods under the provisions of paragraphs (f) to (i), inclusive, of this section, shall be four long blasts.

(2) Acknowledging signals—(i) When draw can be opened immediately. Three long blasts.

(ii) When draw cannot be opened immediately. Two long blasts.

NOTE: As used in this section, the term "long blasts" means distinct blasts of a whistle or horn of approximately three seconds' duration, and the term "short blasts" means distinct blasts of a whistle or horn of approximately one second's duration.

(e) Trains and vehicles shall not be stopped on a bridge for the purpose of delaying its opening, nor shall watercraft be handled so as to hinder or delay the operation of the draw, but all passage over or through a bridge shall be prompt to prevent delay to either land or water traffic.

(f) The general regulations contained in paragraphs (a) to (e) of this section shall apply to all bridges except as modified by the special regulations contained in paragraphs (g) to (l) of this section, prescribed where local conditions require to govern the operation of certain bridges. The special regulations shall not apply to vessels owned or controlled by the United States Government or to vessels employed by the City of Boston or other municipality for police and fire protection. All such United States and municipal vessels shall be passed without delay through the draws of all bridges at any hour day or night.

(g) Mystic River—(1) Bridges from mouth to and including Boston and Maine Railroad bridge between Somerville and Medford. The draws of these bridges shall not be required to be opened for the passage of vessels whose draft is less than 18 feet between 7:45 and 9:00 a.m., 9:10 and 10:00 a.m., and 5:00 and 6:00 p.m., except on Sundays and on legal holidays observed in the locality: Provided, That any vessel or other watercraft proceeding either upstream or downstream which has passed any of these bridges shall be afforded continuous passage through the succeeding bridges.

(2) Metropolitan District Commission highway bridge opposite Harvard Street, Medford. (i) The owner of or agency controlling this bridge will not be required to keep a draw tender in constant attendance.

(ii) Whenever a vessel unable to pass under the closed bridge desires to pass through the draw between 8:00 a.m. and 4:30 p.m. on all days other than Sundays and legal holidays observed in the locality, notice to that effect shall be given to the Superintendent of Bridges, Metropolitan District Commission, Charles River Dam, Boston, Massachusetts, at least one hour in advance of the time passage is desired. Whenever an opening is required between 4:30 p.m. and 8:00 a.m. on all days other than Sundays and legal holidays observed in the locality, notice to that effect shall be given to the Superintendent of Bridges not later than 4:00 p.m. Whenever an opening is required on a Sunday or a legal holiday observed in the locality, notice to that effect shall be given to the Superintendent of Bridges not later than 4:00 p.m. of the day preceding the Sunday or holiday on which the opening is required. In cases of emergency, the draw shall be opened promptly upon notification.

(iii) The owner of or agency controlling the bridge shall keep conspicuously posted on both the upstream and downstream sides of the bridge, in such manner that it can easily be read at any time, a copy of the special regulations in this paragraph pertaining to the bridge together with a notice stating how the Superintendent of Bridges may be reached.

(h) Charles River—(1) Bridges from mouth to and including Metropolitan District Commission Bridge at Charles River Dam, except Charlestown Bridges. The draws of all bridges except the Charlestown Bridge, from the mouth to and including the Metropolitan District Commission bridge between Boston and Cambridge (at Charles River Dam) shall not be required to be opened for the passage of vessels between 6:15 and 9:10 a.m. and 4:15 and 7:40 p.m. except on Sundays and on legal holidays observed in the locality: Provided, That when high tide at Charlestown Navy Yard occurs between 6:15 and 9:10 a.m. the draws shall be opened within 45 minutes before or after high tide for a period of 10 minutes for the passage of all vessels or other watercraft whose draft is 12 feet or over if there be any such desiring to pass, the exact time of opening to be prescribed by the railroad companies, due regard being had for causing minimum interference with railroad schedules, highway traffic, and the interests of navigation, and the opening time of each bridge to be so fixed as to permit continuous passage through the next and following bridges located in direction of course of the vessels or other watercraft.

(2) Charlestown Bridge. The draw of the Charlestown Bridge may remain closed each day between 6:00 a.m. and 11:00 p.m. Monday through Friday. The draw may remain closed on week ends from 6:00 a.m. Saturday to 11:00 p.m. Sunday (to include local holidays when they fall on a Friday or Monday). At all other times, navigation interests shall give at least 10 hours' advance notice of a required bridge opening during October through May, inclusive, and 24 hours' advance notice during June through September, inclusive.

NOTE: The temporary special regulations contained in paragraph (h)(2), and paragraphs (i) and (j), are on a trial basis and are subject to review and amendment at any time by the Department of the Army.

(i) Fort Point Channel—(1) City of Boston highway bridges at Northern Avenue, Congress Street, and Summer Street. The draws of these bridges shall not be required to be opened for the passage of vessels whose

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draft is less than 18 feet between 7:00 and 9:00 a.m. and 4:30 and 6:30 p.m., except on Sundays and legal holidays observed in the locality: Provided, That any vessel or other watercraft proceeding either upstream or downstream which has passed any of these bridges shall be afforded continuous passage through the succeeding bridges.

(2) Congress Street and Summer Street Bridges. The draws of these bridges shall not be required to open for the passage of vessels between 4:00 p.m. and 9:30 a.m., Monday to Saturday, inclusive, except on 10 hours' advanced notice. Between March 31 and November 1, the draws shall not be required to open for the passage of vessels before 9:30 a.m. and after 4:00 p.m. on Sundays, except on 10 hours' advanced notice. Between November 1 and March 31, the draws shall not be required to open for the passage of vessels at any time on Sundays, except on 10 hours' advance notice.

(j) Reserved Channel. The draw of the Summer (L) Street Bridge shall not be required to be opened for the passage of vessels between 4:00 p.m. and 9:30 a.m., Monday to Saturday, inclusive, except on 10 hours' advance notice. Between March 31 and November 1, the draws shall not be required to open for the passage of vessels before 9:30 a.m. and after 4:00 p.m. on Sundays, except on 10 hours' advance notice. Between November 1 and March 31, the draws shall not be required to open for the passage of vessels at any time on Sundays, except on 10 hours' advance notice.

(k) Dorchester Bay: The draw of Dorchester Bay Highway Bridge on William T. Morrissey Boulevard (Old Colony Parkway) between Savin Hill and Commercial Point, Dorchester, Massachusetts, shall not be required to be opened for the passing of vessels from 7:30 a.m. to 9:00 a.m., and from 4:30 p.m. to 6:00 p.m. every day of the week except Saturdays, Sundays or legal holidays observed in the locality and except in case of emergency or during extreme storm conditions.

(l) Neponset River. (1) The New York, New Haven and Hartford Bridge and the highway bridges at Neponset Avenue and Granite Avenue, shall not be required to be opened for the passage of vessels from November 1 to April 30, inclusive, between the hours of 10:00 p.m. and 6:00 a.m., except on at least a 24-hour notice in advance of the time an opening is required.

(2) The 24-hour advance notice will not apply to vessels owned or operated by the United States nor to vessels employed for police and fire protection, nor in an emergency by any vessel when danger to life and/or property is involved. For the type of vessel specified, and in emergencies by any vessel, the owner or agency operating the bridge shall, upon request, arrange for the opening of the drawspan as soon as practicable after receipt of the request.

(3) The owners or agencies controlling the bridges shall keep conspicuously posted on both sides of the bridges, in a position where it can be easily read at any time, a copy of the regulations of this section together with a notice stating to whom the advance notice should be given and directions for communicating with such person.

§ 203.77 North River, Mass.; State of Massachusetts highway bridge between Scituate and Marshfield. (a) The owner of or agency controlling the bridge will not be required to keep draw tenders in constant attendance at the bridge.

(b) Whenever a vessel unable to pass under the closed bridge desires to pass through the draw during the period between May 1, and October 31, at least 4-hours advance notice of the time the opening is required shall be given to the authorized representative of or agency controlling the bridge. For the remainder of the year at least 24-hours advance notice for a desired opening shall be given. For this purpose the owner of the bridge shall provide arrangements whereby the draw tenders can be readily reached by telephone or otherwise at any time of the day or night.

(c) Upon receipt of such notice, the authorized representative of the owner of or agency controlling the bridge, in compliance therewith, shall arrange for the prompt opening of the draw at the time specified in the notice for the passage of the vessel.

(d) The owner of or agency controlling the bridge shall keep conspicuously posted on both sides of the bridge, in a position where it can easily be read at any time, a copy of these regulations together with a notice stating exactly how the representative specified in paragraph (b) of this section may be reached.

(e) Automobiles, trucks, vehicles, vessels, or other watercraft shall not be stopped or manipulated in a manner hindering or delaying the operation of the draw. All passage over the draw or through the draw opening shall be in a manner to expedite both land and water traffic.

(f) The operating machinery of the draw shall be maintained in serviceable condition, and the draw opened and closed at least once each quarter to make certain that the machinery is in proper order for satisfactory operation.

PART 204—DANGER ZONE REGULATIONS:

§ 204.1 Gulf of Maine off Seal Island, Maine; Naval aircraft bombing target area. (a) The danger zone. A circular area with a radius of 1.5 nautical miles, having its center just easterly of Seal Island at latitude 43°53′00″ and longitude 68°44′00″.

(b) The regulations. (1) No aerial bombing practice will take place in the danger zone after 5:00 p.m. Mondays through Saturdays, at any time on Sundays, or during foggy or inclement weather.

(2) Vessels or other watercraft will be allowed to enter the danger zone any time there are no aerial bombing exercises being conducted.

(3) No live ammunition or explosives will be dropped in the area.

(4) Suitable Notice to Mariners, by appropriate meth-

ods, will be issued by the Commander, First Coast Guard District, Boston, Massachusetts; upon request of the Commandant, First Naval District, Boston, Massachusetts, or his designated agent.

(5) Prior to the conducting of each bombing practice, the area will be patrolled by a non-participating naval aircraft to ensure that no watercraft are within the danger zone and to warn any such watercraft seen in the vicinity by means of a signal that bombing practice is about to take place. The patrol aircraft will employ the method of warning known as "buzzing" which consists of low flights by the airplane and repeated opening and closing of the throttle.

(6) Any such watercraft shall, upon being so warned, immediately leave the designated area and, until the conclusion of the practice, shall remain at such distance that it will be safe from falling projectiles.

(7) The regulations of this section shall be enforced by the Commandant, First Naval District, Boston, Massachusetts, or such agencies as he may designate.

§ 204.2 Atlantic Ocean in vicinity of Duck Island, Maine, Isles of Shoals; naval aircraft bombing target area—(a) The danger zone. A circular area with a radius of 500 yards having its center on Shag Rock in the vicinity of Duck Island at latitude 43°00′12″, longitude 70°36′12″.

(b) The regulations. (1) No vessel shall enter or remain in the danger zone from 8:00 a.m. to 5:00 p.m. (local time) daily, except as authorized by the enforcing agency.

(2) This section shall be enforced by the Commandant, First Naval District, and such agencies as he may designate.

PART 207—NAVIGATION REGULATIONS:

§ 207.7 Salem and Beverly Harbors, Mass.; seaplane restricted area—(a) The area. The waters of Salem and Beverly Harbors adjacent to the United States Coast Guard Air Station, Winter Island, Salem, Mass., bounded as follows: Beginning at Fort Pickering Light at the southeastern tip of Winter Island, latitude 42°31′35″, longitude 70°52′01″; thence to Abbot Rock day beacon, latitude 42°31′49″, longitude 70°51′46″; thence to latitude 42°32′01″, longitude 70°51′41″; thence to latitude 42°32′16″, longitude 70°52′00″; thence to latitude 42°32′25″, longitude 70°51′50″; thence to latitude 42°32′17″, longitude 70°51′33″; thence to latitude 42°32′28″, longitude 70°50′46″; thence to latitude 42°32′20″, longitude 70°50′40″; thence to latitude 42°32′03″, longitude 70°51′04″; thence to latitude 42°31′57″, longitude 70°50′53″; thence to latitude 42°31′48″, longitude 70°51′24″; thence to latitude 42°31′33″, longitude 70°51′34″; thence to latitude 42°31′27″, longitude 70°51′24″; thence to latitude 42°31′34″, longitude 70°50′38″; thence to latitude 42°31′28″, longitude 70°50′37″; thence to latitude 42°31′17″, longitude 70°51′53″; thence to latitude 42°30′48″, longitude 70°52′19″; thence to latitude 42°30′54″, longitude 70°52′34″; thence to the northeastern corner of Salem Terminal Company's wharf, latitude 42°31′21″, longitude 70°52′30″; thence to a point on the high water line on the southwestern end of Winter Island, latitude 42°31′33″, longitude 70°52′18″; thence easterly along the southern shore of Winter Island to the point of beginning.

(b) The regulations. (1) No vessel shall moor or anchor within the restricted area.

(2) No fish trap stakes or anchors or lobster pots shall be placed within the restricted area in any manner that will allow the buoys, floats, bobbers, or markers connected thereto to float on the surface within the area.

(3) Lobster pots set outside the restricted area shall be so set that the buoys, floats, bobbers, or markers connected thereto will not under any condition of tide or wind float within the area.

(4) This section shall be enforced by the Commanding Officer, United States Coast Guard Air Station, Salem, Massachusetts, and such agencies as he may designate.

§ 207.8 Massachusetts Bay northeast of Deer Island, Mass.; naval restricted area—(a) The area. The waters within a circular area with a radius of 1,500 feet having its center at latitude 42°21′35″, longitude 70°56′13″.

(b) The regulations. (1) No vessel shall, at any time, except in the case of extreme emergency, anchor within the area.

(2) No vessel shall, at any time, fish, tow a drag of any kind, or set traps in the area.

(3) Any vessel anchoring within the area because of emergency shall contact, by visual means, the Signal Station on Deer Island prior to weighing anchor. Visual instructions will be given as to the exact position relative to the restricted area and for any assistance deemed necessary for clearing fouled anchors in order to prevent damage to underwater installations.

(4) The regulations in this section shall be enforced by the Commandant, First Naval District, Boston, Massachusetts, and such agencies as he may designate.

§ 207.10 Charles River, Mass.; dam of Charles River Basin Commission. (a) The movements of all vessels or boats in and near the lock shall be under the direction of the superintendent in charge of these structures and his assistants, whose orders and signals shall be obeyed.

(b) Every vessel using the lock and drawing more than 10 feet shall be accurately and distinctly marked at the bow and stern, showing the exact draft of water at such portions of the vessel.

(c) All steam vessels desiring to pass through the lock shall signal for the same by two long and two short blasts of the whistle.

(d) (1) All vessels passing through the lock shall have their outboard spars, if any, rigged in, and booms amidships, and secured. All standing and running rigging must be triced in to keep it from blowing out and fouling the drawbridge. Every vessel of 200 tons and under shall be provided with at least two, and every vessel of more than 200 tons shall be provided with at least four good

and sufficient lines, cables, or hawsers. Anchors shall either be stowed or shall hang from hawsepipes, hauled up close, clear of the water if possible. Vessels with anchors under foot or hanging from catheads will not be permitted to enter the lock.

(2) All vessels must be sufficiently manned and must have a sufficient number of round and fore-and-aft fenders to protect the lock from injury. All heavy rope fenders must be securely lashed to prevent their falling into the lock and interfering with the gates.

(e) All vessels approaching the lock while any other vessel going in the opposite direction is in or about to enter it shall be stopped where they will not obstruct the free passage of such other vessel.

(f) It shall be the duty of every master or person in charge of any vessel upon approaching the lock from the upstream end to ascertain by personal observation whether or not the upper lock gate is open, and a vessel shall not be permitted to come within 100 feet of the upper lock gate until the gate has been wholly withdrawn into its recess.

(g) All tow boats, whether towing or not, and other steam vessels of less than 100 tons gross may enter the lock under their own power and without having lines out, but all other vessels, including those which are accompanied by towboats, must attach not less than two good and sufficient lines, cables, or hawsers to the bollards or other fixtures provided for the purpose to check the speed of the vessel and to stop it as soon as it has gone far enough to permit the lock gate behind it to be closed, and each line, cable, or hawser shall be attended on board while passing into the lock by one or more of the vessel's crew. Where vessels are so long that in order to get them wholly within the lock it is necessary to approach within 150 feet of the lock gate ahead, the speed of the vessel must be slow and fully under control by the lines, cables, or hawsers. Steam vessels of more than 100 tons gross, not including towboats, will not be permitted to turn their propellers on entering the lock after the bow of the vessel has entered, but will be drawn in by means of capstans on the lock walls or otherwise, and their speed must be checked and the vessel stopped by lines, cables, or hawsers as in other cases. All steam vessels may leave the lock under their own power. The master or person in charge of a vessel shall arrange to have any line, cable, or hawser handed or thrown from the lock walls by the superintendent or his assistants, made fast on the vessel as requested or directed, so that in cases of emergency such line, cable, or hawser may also be used to check the speed of and stop the vessel.

(h) When a vessel is in position in the lock it shall be securely fastened in a manner satisfactory to the superintendent, or his assistant in charge of the lock at the time, to prevent the vessel from moving about while the lock is being filled or emptied, and the lines, cables, and hawsers used for this purpose shall be attended as far as is necessary or required while the filling or emptying is in progress.

(i) No vessel which has iron or irons projecting from it or lumber or other cargo projecting over its sides shall enter the lock, except at such time and with such precautions to prevent damage to the lock or its appurtenances as the superintendent, or the assistant in charge of the lock at the time, may require.

(j) All persons, whether in charge of vessels or not, are prohibited from willfully or carelessly damaging the lock, any of its appurtenances or the grounds adjacent thereto, and from throwing any material of any kind into the lock. No line shall be attached to anything except the bollards and other fixtures provided for the purpose.

(k) Upon each passage through the lock, the master or clerk of a vessel shall make a statement of the kind and tonnage of the freight carried.

(l) No person shall cause or permit any vessel or boat of which he is in charge to remain in the lock or its approaches for a longer time than is necessary for the passage of the lock, unless he is especially permitted to do so by the superintendent or the assistant in charge of the lock at the time, and if such vessel or boat is, in the opinion of such superintendent or assistant, in a position to obstruct navigation it shall be removed at once as requested or directed by such superintendent or assistant.

(m) All registered merchant vessels shall pass through the lock in the order directed by the superintendent or the assistant in charge of the lock at the time. Unregistered craft will not be allowed to pass through the lock separately unless especially permitted by such superintendent or assistant.

(n) The lock shall be operated promptly for the passage of all vessels upon signal, excepting only in such cases as are specifically provided for in this section.

§ 207.20 Cape Cod Canal, Mass.; use, administration, and navigation. (See United States Coast Pilot 2, Atlantic Coast, Cape Cod to Sandy Hook.)

3. EASTPORT TO CAPE COD

The **Gulf of Maine** is the great indentation of the coast between the Canadian Province of Nova Scotia on the northeast and Massachusetts on the southwest. It includes the Bay of Fundy and Massachusetts Bay as subsidiary features. Because of its changeable weather, frequent fogs, and strong tidal currents, this area has a bad reputation among mariners.

From West Quoddy Head to Penobscot Bay the coast is mostly rocky and is indented by numerous large bays and excellent harbors. Among the many islands along this coast are passages that are much used, usually by vessels of less than 12 feet in draft, as they afford anchorage in head winds or thick weather. The many boulders, rocks, and ledges along and off this coast require the closest attention of the navigator, as in many cases they rise abruptly from deep water and soundings do not generally indicate their proximity until it is too late to avoid them. The navigator should also remember that the spring range of tide is 11 feet at Rockland, 13 feet at Milbridge, and 21 feet at Eastport, and that a vessel may sometimes pass over places at high water on which she would bring up at low water.

Between Penobscot Bay and Cape Elizabeth the coast is rocky and broken by numerous bays and rivers, many of which are excellent harbors. In Muscongus and Casco Bays good channels lead between the islands, affording inside passages that are used by the smaller class of vessels passing along the coast. Extreme caution should be exercised when approaching the bays, sounds, and rivers in this area due to the inset of the flood tidal currents, particularly to small craft crossing Penobscot Bay and the mouths of Kennebec, Sheepscot, and New Meadows Rivers when the wind is contrary to the current. Great caution is also necessary when standing along this stretch of coast in thick weather because of the numerous dangers which in some cases lie nearly 10 miles offshore.

Between Cape Elizabeth and Portsmouth there are fewer harbors and marked indentations. The shore is more thickly settled than farther eastward, and several of the beaches are popular summer resorts. The outlying dangers are well marked and fewer in number.

Southward of Portsmouth the coast is low and mostly sandy, with a few outcropping ledges and outlying dangers, but the northern shore of Cape Ann is high and rocky.

Between Cape Ann and Plymouth the coast is rocky, mostly bold, and has numerous islands, dry rocks, boulders, and sunken ledges near the shore, with deep channels between them. The shores of Cape Cod Bay are mostly sandy, with extensive sand shoals extending out well from the shore in many places. Boulders also occur in places in Cape Cod Bay.

Prominent features.—The coast between West Quoddy Head and Little River, 14 miles, presents no special features. From Little River westward to Portland the shore is broken by numerous bays and islands. Grand Manan Island has nearly perpendicular, dark, rocky faces about 200 feet high on its western side.

The radio towers on the peninsula north of Cross Island on the east side of Machias Bay are prominent. The radar towers on Howard Mountain west of Machias Bay can be seen many miles at sea. The water tanks at Jonesport are also prominent.

Pigeon Hill, on the western side of Pigeon Hill Bay near the head, is 307 feet high. Schoodic Head, near the south end of Schoodic Peninsula, on the eastern side of the entrance to Frenchman Bay, is 437 feet high.

Cadillac Mountain, the highest on Mount Desert Island, is 1,532 feet high and the most prominent landmark on this part of the coast; near it are other mountains nearly as high. Isle au Haut is 543 feet high near its northern end and is on the eastern side of the entrance to East Penobscot Bay. The Camden Hills (Mount Megunticook, 1,380 feet) are on the western side of Penobscot Bay above the town of Camden. Monhegan Island, 9.3 miles from the mainland, is 160 feet high and is a mark for all vessels bound into Penobscot Bay from westward. Seguin Island, about 2.3 miles off the mouth of the Kennebec River, is about 145 feet high and is a mark for vessels bound into the river or standing along the coast. Observation towers may be seen along the coast west of the Kennebec River to Boston.

Cape Elizabeth, on the southern side of the entrance to Portland Harbor, is about 90 feet high and is marked by a light and an unused light tower. A tall elevated water tank near the mouth of the Saco River is the most prominent landmark between Portland and Portsmouth. Agamenticus Mountain, 691 feet high and the most prominent land feature between Portland and Cape Ann, is about 4.5 miles inland and 9 miles northeastward of Portsmouth. The Isles of Shoals, lying about 5.5 miles from the coast and southeastward of Portsmouth Harbor entrance, can be seen a long distance, the large hotels being conspicuous marks. Boon Island Light is about 9 miles northeastward of the Isles of Shoals and about 6.5 miles offshore. Cape Ann is high at its northern end, but its eastern end is comparatively low. The two light towers on Thatcher Island are the most conspicuous marks seen when approaching the cape.

The land southward of Cape Ann is comparatively low,

is well settled, and has numerous artificial marks. The prominent objects visible in approaching Cape Cod are described in Chapter 12.

In the approaches to Boston Harbor the most prominent landmarks are two radio towers at Nantasket Beach, a tower on Nantasket Hill, a standpipe on Winthrop Head, the Boston Customhouse tower, and the gas tanks at Chelsea and Dorchester.

Boundary lines of inland waters.—At all buoyed entrances from seaward to bays, sounds, rivers, or other estuaries for which specific lines are not described, **Inland Pilot Rules** apply shoreward of the outermost buoy or other aid to navigation of any system of aids; **International Pilot Rules** apply outside the aids. Specific lines are described in § **82,** Chapter 2.

Anchorages.—Between West Quoddy Head and Portland, anchorages are numerous, those most frequently used by coasting vessels being Little River, Starboard Cove, Englishman Bay, Narraguagus Bay, Winter Harbor, Southwest Harbor, Rockland Harbor, Port Clyde, Boothbay Harbor, and Portland Harbor. Southward of Portland the only anchorages available for large vessels are in the harbors of Portsmouth, Gloucester, Salem, Boston, Plymouth, and Provincetown. Other harbors available for small vessels and motorboats are described in the text. Anchorage areas established by Federal Regulations are given in § **202,** Chapter 2.

Dangers.—The Gulf of Maine is a region of ledges and boulders. The ledges rise abruptly from deep water and the boulders ordinarily lie singly or in clusters on an otherwise flat bottom, so that the navigator cannot depend on soundings to avoid them. The depths are so variable that it is quite impossible to determine a vessel's position by soundings alone, but the navigator will find a frequent use of the sounding apparatus of the greatest assistance in approaching both Georges and Browns Bank from southward and eastward because the bottom slope in that area is well defined.

As a measure of safety, vessels should avoid broken ground where abrupt changes are indicated by the chart to depths less than 10 or 12 fathoms. Dangers have been found in places where least depths of as much as 20 fathoms were the only indications found by the survey. It is always safest, therefore, to select from the chart a sailing line which leads in the deepest water and well clear of broken ground.

The principal offshore dangers are Ammen Rock, a part of Cashes Ledge; Georges and Cultivator Shoals, both a part of Georges Bank; and Nantucket Shoals.

Chart 71.—Browns Bank (42°38′ N., 65°52′ W.) as defined by the 50-fathom curve, is 56 miles long east and west, and has an average width of 15 miles. Near the western end of the bank is a sandy ridge with depths of 16 to 28 fathoms. Between the inner 50-fathom curve of Browns Bank and the coastal bank at the southwestern end of Nova Scotia are depths of 51 to 88 fathoms.

Cape Sable (43°24′ N., 65°37′ W.), the southern extremity of Nova Scotia, is marked with a light and fog signal, and the principal dangers off it, **Brazil Rock** and **Blonde Rock,** are marked by lighted whistle buoys. **Seal Island,** 17.5 miles west of Cape Sable, has a light, fog signal, and radiobeacon on the southern end.

Lurcher Shoal (43°50′ N., 66°30′ W.), 13 miles off the west coast of Nova Scotia, has a least depth of 1½ fathoms. It is the most westerly danger off the coast of Nova Scotia in the approaches to the Bay of Fundy. It is marked by a lightship.

Chart 1106.—Grand Manan Banks (44°12′ N., 67°05′ W.), 19 miles southward of Grand Manan Island, have an extent of about 15 miles in a northeast-southwest direction and consist of two sections, **Northeast Bank** and **Southwest Bank,** with a channel 2.5 miles wide between them. The bottom is rocky and the least depth, 16 fathoms, is found on Northeast Bank. The tidal currents on the banks attain a velocity of 1.5 knots at half tide, at which time there are extensive tide rips with both flood and ebb. The flood current sets to the north-northeast and the ebb to the south-southwest. A good check on the position of a vessel may be obtained by soundings on these banks.

Nova Scotia and the Bay of Fundy are described in **H.O. Publication 99, Sailing Directions for Nova Scotia,** published by the Navy Hydrographic Office, Washington, D.C.

Jeffreys Bank (43°22′ N., 68°44′ W.), with a least found depth of 35 fathoms, lies about 26 miles southward of Matinicus Rock Light.

Platts Bank (43°12′ N., 69°40′ W.), has a least found depth of 29 fathoms. Banks with depths of 41 to 50 fathoms are about 5 miles northwestward, and 15 miles eastward of the shoalest part of Platts Bank.

Cashes Ledge (42°54′ N., 68°57′ W.), with depths of less than 30 fathoms, is about 6 miles long. **Ammen Rock,** with a depth of 4¼ fathoms, is near the middle of the ledge. There is a whistle buoy on the east side. The sea breaks over this rock in heavy weather.

Fippennies Ledge (42°47′ N., 69°18′ W.), with a least known depth of 37 fathoms, lies about 16 miles west of Ammen Rock.

Jeffreys Ledge extends northeastward from Cape Ann and has general depths of 17 to 30 fathoms and more. The northeastern point of the ledge is 20 miles eastward of Boon Island Light. A whistle buoy is on the ledge about 32 miles east-northeastward of Cape Ann.

Stellwagen Bank lies northward of Cape Cod and off the entrance to Massachusetts Bay; depths found over it are 9 to 20 fathoms.

Chart 1107.—Georges Bank is an extensive bank with depths of less than 50 fathoms that extend over 150 miles northeastward from the offshore end of Nantucket Shoals.

In heavy weather the danger area is the oval-shaped top of the bank which is about 80 miles long in a northeast-southwest direction and 50 miles in maximum width. The bottom in this area is extremely broken and irregular, with a great number of ridges and shoal spots having depths of less than 10 fathoms. Between these

shoals are channels of varying widths in which depths of about 20 fathoms may be found. All of this area lies within the 30-fathom curve and so much of it has depths of less than 20 fathoms that it may practically all be considered to lie within a generalized 20-fathom curve.

On the southeast side of the bank, outside the 20-fathom curve, the water deepens gradually and with such regularity that soundings would be of considerable value in approaching the bank. On the northwest side the water deepens more rapidly.

The bottom is mostly sand, sometimes with shell, and in places pebbles. Bottom samples obtained during surveys are described in a great many places on the charts.

The two principal dangers on Georges Bank are Georges Shoal and Cultivator Shoal, which are near the center of the danger area. Around these shoals the sea breaks in depths of 10 fathoms during heavy weather and the locality should be avoided by deep-draft vessels.

Georges Shoal is a ridge about 13 miles long on which are several shallow depths of 1½ to 3 fathoms. A Texas Tower with lights and a fog signal, and surmounted by radar and radio towers, is on the north part of the shoal in 41°42′ N., 67°46′ W. The entire structure is flood-lighted at night.

Cultivator Shoal, about 20 miles westward of the Texas Tower on Georges Shoal, is a ridge nearly 15 miles long, on which depths of 3 to 10 fathoms are found. The 3-fathom spot is near the north end of the shoal and is marked on the north side by a whistle buoy.

The entire area within the 20-fathom curve has an extremely broken bottom. There are numerous ridges and shoal spots on which depths dangerous to navigation, particularly in heavy weather, may be found. These shoal spots generally have steep sides, and very little or no indication of their existence is given by soundings. Tide rips and swirls, as well as overfalls, are common in the vicinity of these spots, but are not always visible. They show best with a smooth sea and with the current flowing in certain directions. These disturbances are not usually over the shoalest depths but are commonly alongside them. Small, detached overfalls may be seen in 20 fathoms of water. The tidal currents are rotary with no period of slack water. The velocity at strength is about 2 knots and the velocity of the minimum current which occurs about midway between the times of strength is about 1 knot. The flood sets northward and the ebb southward. The hourly velocities and directions of the tidal current are shown by means of current roses on Coast and Geodetic Survey charts.

A navigator must bear in mind while in an area of this character that it is impossible for the surveyor, without a vast expenditure of time, to determine and locate all of the shoalest spots on the many dangerous shoals found. Sudden shoaling on such a bank must be considered an indication of possibly dangerous water. This bank has not been wire-dragged.

Between the 50-fathom curve at the eastern end of Georges Bank and the outer 50-fathom curve on Browns Bank to the northeastward is a gully about 25 miles wide.

Nantucket Shoals is the general name of the numerous different broken shoals which lie southeastward of Nantucket Island and make this one of the most dangerous parts of the coast of the United States for the navigator. These shoals extend 23 miles eastward and 40 miles southeastward from Nantucket Island. They are shifting in nature and the depths vary from 3 and 4 feet on some to 4 and 5 fathoms on others, while slues with depths of 10 fathoms or more lead between those farthest offshore. The easterly edge of the shoals has depths of 3½ and 4 fathoms in places.

The currents in the area are strong and erratic, reaching a velocity of 3 to 5 knots around the edges of the shoals. The currents are generally rotary in character, and strongest in a northeast-southwest direction. They are made erratic by the obstruction of the shoals, in some cases being deflected to such an extent as to cause the direction to change 180° from one side of the shoal to the other.

When possible Nantucket Shoals should be avoided entirely by deep-draft vessels and by light-draft vessels without local knowledge because of the treacherous currents. There are, however, channels through these various shoals which can be negotiated with local knowledge and caution. At slack water in calm weather these shoals are sometimes difficult to see and a vessel is liable to be taken into shoaler water than was intended.

Calm, clear days are few; when the sea is calm it is usually foggy, and when clear, it is usually rough. Also, a considerable amount of hazy weather is to be expected, and this limits visibility.

Should it become necessary to anchor in this area, open sea anchorage may be had anywhere that depths permit. Consideration should be given to the proximity of shoals and to the possibility of dragging due to winds and currents. Generally it has been found best to avoid the deeper channels and, when rougher water is experienced, to anchor in the lee of a shoal which would tend to knock down the heavier swells. A scope of five to one or greater should always be used.

Phelps Bank, the southeasternmost part of the Nantucket Shoals, is about 6.5 miles long and 2.5 miles wide. **Asia Rip,** the shoalest point of the bank with a depth of 5¾ fathoms, is at the southern end. The wreck of the SS OREGON with 3¼ fathoms over it is 3 miles south-southeastward of Asia Rip in 40°45′ N., 69°19′ W. The other shoals and rips of Nantucket Shoals are described in **United States Coast Pilot 2, Atlantic Coast, Cape Cod to Sandy Hook.**

Deep-draft vessels should pass southward and eastward of the wreck off Asia Rip, and eastward of the easterly edge of the shoals as defined above. For a distance of 15 miles eastward and southeastward and 17 miles southward from Nantucket Island, the shoals have depths less than 16 feet, and this area should be avoided by all vessels. The tidal currents are strong, and variable in direction, forming extensive rips and broken water over the shoals.

A Texas Tower with lights and a fog signal, sur-

mounted by radar and radio towers, is near the southwest side of Fishing Rip in 41°01′N., 69°30′W. The entire structure is flood-lighted at night.

Nantucket Shoals Lightship (40°33′ N., 69°28′ W.), is moored about 48 miles south-southeastward of Nantucket Island. The vessel has a red hull with the name NANTUCKET in large white letters on the sides. A light, 57 feet above the water, is shown from the foremast. The radiobeacon and the fog signal are synchronized for distance finding.

Great South Channel is the passage across Georges Bank between the easternmost of the Nantucket Shoals and the westernmost shoal spots of the bank. The channel is about 30 miles wide and has a least depth of 25 fathoms.

Submarine canyons are indentations in the edge of the **continental shelf**, which is bounded on its seaward side by the 100-fathom curve. They may be traced from depths of 1,000 fathoms or more to the shoaler areas of the shelf. The navigator who has available some means of echo sounding should have in mind the various canyons in this locality. The soundings in crossing them are very characteristic in each case and such soundings may be used to determine the vessel's position with considerable accuracy.

Some of the more important canyons are named on the charts. **Corsair Canyon**, in approximate longitude 66°10′ W., on the eastern side of Georges Bank, has a northwesterly trend. On the southern side and toward the western end of Georges Bank, and with a northerly trend, are **Lydonia Canyon**, 67°40′ W.; **Gilbert Canyon**, 67°50′ W.; **Oceanographer Canyon**, 68°05′ W.; and **Welker Canyon**, 68°30′ W. Southeastward and southward of Nantucket Shoals, and with a northerly trend, are **Hydrographer Canyon**, 69°00′ W.; **Veatch Canyon**, 69°35′ W.; and **Atlantic Canyon**, 70°15′ W.

Wrecks.—An examination of the record of wrecks along the coast of Maine eastward of Portland shows that wrecks have occurred on practically all of the offlying islands and rocks between Portland and Machias Bay, most of them in thick weather, either fog or snow. Many of the wrecks could have been prevented if frequent soundings had been taken, or due allowance had been made for the tidal currents setting into or out of bays or rivers.

During thick weather great caution is necessary when approaching the coast, especially eastward of Petit Manan Island, where the tidal currents have considerable velocity. If one of the offshore lights has not been made and the position accurately determined before the fog shuts in, it is advisable to keep well outside until it clears. Between Machias Bay and Seguin Island a landfall will be made in clear weather before the outlying dangers are encountered. Vessels will clear all unmarked dangers by keeping three miles outside of the headlands and outlying islands.

South of Portland the wrecks have occurred most frequently on the prominent headlands or the shoals off them, namely, Cape Elizabeth, Cape Ann, and the north side of Cape Cod, with less frequent wrecks on the less prominent headlands. Numerous wrecks have also occurred on the dangers in the approaches to Boston Harbor, more frequently on the south side from Scituate to Point Allerton. Most of the wrecks have occurred during thick weather.

Between Portland and Boston the most dangerous points for coasting vessels are the dangers off Cape Elizabeth, Boon Island, Isles of Shoals, Cape Ann, and the dangers in the entrance to Boston Harbor. The soundings in the vicinity of Cape Ann are very irregular and cannot be depended upon to fix even approximately the vessel's position.

The numerous strandings on the north end of Cape Cod, between Cape Cod Light and Race Point Light have usually occurred to vessels approaching Massachusetts Bay or Cape Cod Bay from southward or eastward in thick weather. Keeping in a greater depth than 20 fathoms will insure giving the eastern side of Cape Cod a berth of 3 miles, and if this depth is followed will lead to Peaked Hill Bar lighted whistle bouy, northeastward of the end of the cape.

Lobster pots.—The inland waters, particularly those from St. Croix River to the vicinity of Portland, contain numerous lobster pots. Small painted wooden buoys of various designs and colors, secured by small lines, float on the surface; in some cases a second buoy, usually unpainted and hard to see, is attached to the lobster pot. These buoys extend from the shore out to, and in many cases across, the sailing routes. Small yachts and motorboats are cautioned against fouling, which is liable to result in a sprung shaft or propeller.

Fishweirs.—Regulations prescribe that fishing structures and appliances in navigable waters of the United States shall be lighted for the safety of navigation. The lights shall be displayed between sunset and sunrise. They shall be placed at each end of the structure excepting where the inner end terminates in such situation that there is no practicable navigation between it and the high waterline of the adjacent coast, in which case no inner light shall be displayed. The outer light shall be white and the inner light shall be red. The size, capacity, and manner of maintenance of the lights shall be such as may be specified in the Army Department permit authorizing the erection of the structure or appliance. When several structures or appliances are placed on one line with no navigable passage between them, they will be considered, for lighting purposes, as one structure.

Fishweirs are numerous along the outside coast and inside waters. The stakes often become broken off below the waterline and form a danger to navigation. Strangers should proceed with caution when crossing areas of possible fishweirs, and should avoid crossing such areas at night, whenever possible.

ROUTES.—Approaching or standing along the coast of Maine eastward of Portland.—This section of the coast is dangerous on account of the strong tidal currents, frequent fog, and numerous off-lying dangers. Soundings

are of little assistance to locate the position of a vessel, but they should be taken at frequent intervals to prevent too close an approach to dangers.

Coming from the vicinity of Cape Sable.—Vessels bound to Machias or ports eastward of it should make Machias Seal Island Light and pass westward of it. If bound to Eastport or Calais, the route through Grand Manan Channel is preferable to passing eastward of Grand Manan Island, because in bad weather an anchorage may be made either at Little River or in Machias Bay.

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

If bound to ports in Penobscot Bay, vessels should steer so as to make either Mount Desert Light or Matinicus Rock Light. On a clear day Cadillac Mountain, the highest part of Mount Desert Island, may be sighted before Mount Desert Light, and Isle au Haut may be seen about the same time as Matinicus Rock.

Coming from the vicinity of Cape Cod or Cape Ann.—Vessels, both steamers and large tows, bound into Penobscot Bay, including those coming from Boston and Cape Cod Canal, and also those passing eastward of Cape Cod, usually make the lighted whistle buoy off Cape Ann and then shape the course for Manana Island Lighted Whistle Buoy and enter through Two Bush or Muscle Ridge Channels. In the winter and in bad weather the small class of vessels follow the coast, sighting the principal lights, and making an anchorage on approach of bad weather. Vessels bound from Cape Cod or Cape Ann to points eastward of Penobscot Bay usually shape the course from Cape Ann to either Monhegan Island or Matinicus Rock Light.

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

Standing along the coast.—In clear weather, vessels stand along the coast close enough to make the lights and to recognize the principal landmarks on shore. In thick weather they aim to make the fog signals or the whistle or bell buoys; these buoys are placed close enough to one another and to the fog signals to be readily followed up by vessels if not set too much off their course by the tidal currents. When running in thick weather a vessel should verify her position as often as possible by the aids, and when approaching a fog signal or buoy should proceed slowly, taking soundings, and if necessary stop until the looked-for aid is found and recognized before she continues for the next aid. Three good harbors for which a stranger standing along the coast in their vicinity can make in thick weather and enter with ordinary precautions are Machias Bay, Winter Harbor, and Boothbay Harbor.

Approaching or standing along the coast between Portland and Cape Cod.—Approaching Massachusetts Bay from sea.—The approach to the coast of Massachusetts north of Cape Cod is through the Gulf of Maine. Nantucket Shoals and Georges Bank, on account of their many shoal spots and the strong tidal currents setting over them, are a menace to navigators approaching the coast or standing from Canadian ports to New York. Browns Bank need not be avoided for its soundings may assist in determining a vessel's approximate position.

The part of Georges Bank lying between latitude 41°05′ N., and 42°00′ N., and longitude 67°17′ W., and 68°35′ W. should be avoided. In heavy weather the sea breaks on the spots with 10 fathoms or less, and strong tide rips are encountered. The tide rips do not always indicate shoal water.

Vessels passing south of the dangerous part of Georges Bank should keep in 25 fathoms or more. Approaching this part of the bank from eastward or southward, the water shoals gradually. Approaching from westward, the depths are irregular and the water shoals abruptly in places of 20 fathoms or less. On the north side of Georges Bank, between longitudes 66°00′ W., and 68°00′ W., the 100-fathom and 50-fathom curves are only a few miles apart, and when approaching the dangerous part of the bank from northward 50 fathoms may be taken as a good depth to avoid the shoals.

Vessels equipped with echo sounding and following the 100-fathom curve along the south side of Georges Bank, can frequently verify their position when crossing the several submarine gorges.

The only known outlying danger in the Gulf of Maine to be avoided by vessels bound to ports in Massachusetts is Ammen Rock which is a part of Cashes Ledge and has 4¼ fathoms over it.

Vessels from ports in northern Europe or the British Provinces and bound to ports in the United States north of Cape Cod approach the coast passing Cape Sable and Georges Bank, between latitudes 42°00′ N., and 43°10′ N. If bound to Boston, they cross Browns Bank and shape the course for Boston Lightship.

The **North Atlantic Lane Routes** are described in H.O. Publication 99, Sailing Directions for Nova Scotia, published by the Navy Hydrographic Office, Washington, D.C. They are shown on the Pilot Chart of the North Atlantic Ocean (H.O. 1400) and on the back of the Track Chart of the World (H.O. Chart 1262).

Vessels approaching the Gulf of Maine from southwest sometimes endeavor to make the 50-fathom curve on the southern edge of Georges Bank, in latitude 40°20′ N., and longitude 68°50′ W., then stand 000° on soundings of over 30 and less than 50 fathoms for about 50 miles, and then shape a 323° course, taking care to keep in a greater depth than 20 fathoms until the course is laid to sight Cape Cod Light. This light, Nauset Beach Light, the skeleton radio towers, and the Pilgrim Monument at Provincetown are the most prominent marks on Cape Cod.

Deep-draft vessels coming from Cape Hatteras, Chesapeake Bay, Delaware Bay, or New York make Nantucket Shoals Lightship, thence through Great South Channel to the Gulf of Maine.

Vessels of medium draft coming from southward or alongshore may use the Cape Cod Canal or enter the Gulf of Maine through Vineyard and Nantucket Sounds. The controlling depth for these passages is about 30 feet. These routes avoid Nantucket Shoals, and are followed by vessels in the coasting trade.

Standing along the coast between Portland and Cape Cod.—The lights and other aids to navigation are sufficiently numerous to enable a stranger to run either at night or the daytime in clear weather. There are numerous anchorages where a vessel with good ground tackle can ride out any gale. Of these, Provincetown Harbor is the harbor of refuge most frequently used by vessels approaching Massachusetts Bay from seaward. The navigator, when crossing the banks and when approaching the coast, should not neglect to take soundings at frequent intervals, and vessels equipped with the necessary electronic apparatus should make use of radar, loran, and the radiobeacons located along the coast.

Currents.—The Tidal Current Tables should be consulted for specific information about times, directions, and velocities of the current at the numerous locations throughout the area. Tidal current charts are available for Boston Harbor.

The current movement is very nearly simultaneous throughout the offshore area of the Gulf of Maine. It is generally rotary in character, the direction of flow changing continuously in a clockwise movement with no period of slack water.

The velocity at strength over Georges Bank varies from about 1 knot to 2 knots. The velocity of the minimum current which occurs midway between the times of strength is usually about one-half the velocity at strength.

Between Georges Bank and Browns Bank the velocity at strength is about 1.5 knots, and there is a like velocity between Browns Bank and Cape Sable Bank.

Off Nova Scotia, outside the 50-fathom curve, the velocity at the time of strength is about 1.5 knots; inside the 50-fathom curve the velocity is between 1.5 and 2.5 knots. The tidal currents offshore from Cape Sable are very uncertain, both in velocity and direction. It is reported that the tidal current on Browns Bank occasionally runs to the northeastward for 15 hours continuously with a velocity of 2 knots, while at other times the set is as strong to the southwestward.

In Grand Manan Channel the average velocity at strength of the current is about 2.5 knots. The currents set approximately parallel to the channel, the flood setting northeastward and the ebb southwestward.

At the entrance to the Bay of Fundy, 5 miles southeastward of Gannet Rock, the flood current has an average velocity at strength of about 2.5 knots and sets 040°. The ebb has an average velocity at strength of about 4 knots and sets 230°.

Along the axis of the Bay of Fundy from Grand Manan Island to Cape Spencer the currents have an average velocity at strength of from 1.5 to 2 knots. The flood sets northeastward and the ebb southwestward.

Eastward of Mount Desert Island the tidal currents along the coast are stronger and more regular than those farther west. Between Mount Desert Island and Portland there is a westward resultant drift along the coast.

With easterly or southeasterly winds the currents have a tendency to set toward the shore.

At Portland Lightship the tidal current is weak, being on the average less than 0.3 knot at time of strength, setting 335° on the flood and 140° on the ebb. Since the tidal current is weak, currents of 1 knot or more occur only with strong winds. The largest velocity likely to occur is about 1.5 knots.

At Boston Lightship the tidal current is weak, averaging less than 0.2 knots at strength. The velocity and direction of the current is, therefore, greatly influenced by the wind. The largest velocity likely to occur is about 1 knot.

Over Stellwagen Bank, and in the channel between it and Cape Cod, the flood current sets westward and the ebb northeastward to eastward. The velocity at strength increases from about 0.2 knot at the northern end of the bank to over 1 knot at the southern end.

Along the coast of Maine eastward of Portland the flood sets eastward and has greater velocity than the ebb, which sets westward. In passing from one headland to another it is always necessary to make allowance for the current setting into or out of the bays or rivers, according to the stage of the tide; such allowance frequently amounts to as much as 5°.

WEATHER.—The Appendix includes climatological tables for four Atlantic coast localities and a table of fog-signal operation. Also listed are Weather Bureau offices, storm warning displays, and radio stations which transmit weather information.

General.—The principal influences on the climate of the New England coastal area are its location in middle latitudes on the lee side of the large continent of North America, its position in the area of the most frequent movement of cyclonic storms, and the cold ocean current which flows southward near the coast.

The region between latitudes 41° and 45°N. is in the general zone of west-to-east air motion, on which are superimposed the northward and southward movements of large air masses from tropical and polar regions. These produce frequent changes and great variety in the weather elements, especially in winter.

New England lies along one of the paths most favored by extratropical cyclones. During frontal passages associated with these frequent and periodic storms in the colder months, changes in wind, temperature, and clouds are sometimes abrupt. During the warmer months, with the progressive intensification and expansion of the Bermuda-Azores anticyclone, predominant winds along the coast are between west and southwest, and cyclonic activity declines. Stormy weather during summer and early autumn occasionally results from the movement of tropical cyclones into the area.

The Labrador Current flows southward along the Nova Scotia coast, branching to bring cold water into the Gulf of Maine, and exerts a considerable moderating

influence on the immediate coastal and near offshore region. In summer with winds from the southwest and west, the moist air, which is warmer than the water, is cooled; this tends to form fog. In the winter the air temperature over the water may be somewhat warmer than over land. Winds flow predominantly from the colder interior of the continent and are moderated in passing over the now relatively warm water of the Labrador Current and much warmer Gulf Stream to the east. This contrast of surface temperatures also helps maintain a region of cyclogenesis, or storm formation, off the east coast.

Pressure.—In the winter the New England area lies about midway between the Icelandic low-pressure area and the moderate North American continental high-pressure area. These mean pressure systems orient the isobars in a northwest-southeast direction over the region, and result in prevailing west-to-north winds in the coastal sections.

In spring and early summer both the continental high and the Icelandic low weaken, and the Azores-Bermuda high intensifies and expands over most of the Atlantic Ocean. This extensive high pressure area shifts northward during the summer, with the center reaching 35° to 40° N. near mid-ocean in August and September. In the New England area, located in the northwestern quadrant of the high, the isobars during the warmer months are oriented in a northeast-southwest direction, and the prevailing winds are southwesterly.

There are, however, great day-to-day variations in pressure, wind, and weather produced by migratory low- and high-pressure systems which tend to be more intense and to move faster in winter than in summer. The New England area includes some of the paths most frequently traveled by these pressure systems, and deviations from the mean pressure may be large, with consequent changes in wind and weather.

The mean monthly atmospheric pressure shows small variation during the year, the normal level ranging from 1012–1015 millibars (29.88–29.97 inches) in spring and early summer to 1018–1020 millibars (30.06–30.12 inches) in winter.

Winds.—The prevailing wind direction over the ocean area, from October to March, is between west and north. From March until the summer regime is established, the winds are variable, but from June to September they generally are between west and south. The windiest period is from December to March, and the weakest winds are from May to August. In winter the average wind force is between 4 and 5, and in summer between force 3 and 4. Summer winds are more persistent in direction than winter winds.

Along the coast, as shown in the tables in the Appendix, the general features of wind direction are similar to those over the water area, except where modified by local topography. Windspeeds over the sea are nearly always greater than over land, and there may be twice the number of gales at sea.

Hot summer afternoons are frequently relieved by a refreshing wind blowing onshore from the cooler water along most of this coast. The effect of this sea breeze seldom penetrates more than 10 miles inland, and much less at several points.

Temperatures.—In January, land temperatures average from 21° F. at Eastport to 29° F. at Boston and 32° F. at Nantucket. In July, temperatures average from 68° F. at Boston and 67° F. at Nantucket to 60° F. at Eastport. Extreme temperatures at these places include: —23° F. at Eastport, —18° F. at Boston, and —6° F. at Nantucket; 104° F. at Boston, 95° F. at Nantucket, and 93° F. at Eastport.

In all seasons, changes in wind direction can cause large temperature fluctuations. In winter, southerly and southwesterly winds may bring mild weather, while northwesterly winds may be very cold. In summer, warm weather occurs with southwesterly and westerly winds, and northeast winds may be cool and sometimes chilly.

Temperatures at sea average about 4° F. to 8° F. higher in January, and 2° F. to 6° F. lower in July than along the coast.

Humidity.—Relative humidity is high throughout the year, and seasonal variations are small. Humidity is generally lower with winds from the continent and higher with southerly and easterly winds from the ocean.

Precipitation.—Although precipitation amounts at sea are not measured, the ship observations reporting precipitation show a maximum in winter and spring, ranging from a high of near 20 percent in January to less than 10 percent in July and August. Some 5 to 10 percent of all observations report snow in January and February.

In the winter when a cyclone passes to the south or southeast, precipitation over the coastal area generally falls as snow. On rare occasions freezing rain may be encountered, which coats all objects with a layer of ice and can cause damage to rigging if prolonged. Along the coastal area precipitation amounts are fairly uniformly distributed throughout the year, ranging from about 2.5 to 4.5 inches per month.

Thunderstorms are not frequent, occurring on an average of less than 20 days per year, mainly during June, July, and August. Over the sea their frequency and severity decrease.

Cloudiness.—Low clouds covering 0.6 or more of the sky are reported in nearly one-half the vessel observations in the New England offshore area from November through March, while only 20 to 30 percent of the July-October observations report this condition. Overcast conditions of 0.8 to 1.0 sky cover at the coastal stations range from about 55 to 60 percent in winter to 30 to 40 percent in summer.

Total cloud amounts measured at the coastal stations also indicate the sky cover at sea. In winter the amount will tend to become progressively greater downwind with winds between west and north.

Visibility.—Poor visibility may be produced by fog, haze, rain, and snow. Advection sea fog is the type most common on the New England coast. It occurs when warm humid air is cooled in passing over the cold ocean, usually during warmer months when the winds are from the south or southwest. This may, however, happen at

any season. These fogs often set in almost without warning, and have been known to persist for three weeks almost without interruption.

The areas along the coast, at the heads of bays, and within the rivers, are often comparatively clear while fog is very thick outside. Over the interior waters, fog usually clears during the middle of the day. The frequency of fog over land and ocean is in opposite phase; that is, most land fog occurs in winter, and most sea fog in summer. Consequently, figures for fog or poor visibility at inland or sheltered harbors are no guide to conditions at sea or in the approaches.

Steam fog (sea smoke), sometimes encountered in winter, forms in very cold weather when the air temperature is much lower than that of the water.

Fog is more likely to form with light to moderate winds. The most frequent wind forces accompanying sea fog are 2 to 4. Fog rarely forms and persists with winds of gale force.

Extratropical Cyclones.—The New England area lies on, or very near, the paths most frequently followed by extratropical cyclones, and consequently experiences frequent wind shifts and rapid weather changes in the cooler seasons. These depressions generally enter the area from the west, with the low center passing through New England or down the St. Lawrence Valley; or enter from the southwest, with the center offshore. These latter northeastward-moving storms are likely to be of greater severity, with respect to precipitation and wind, due to a considerable passage over water. Heavy rain or snow before the passage of the storm center may be extensive, and gales of hurricane force sometimes accompany them. In these coastal storms, winds from the north or northeast back to north and northwest as the storm center moves to the northeast out of the region. The northwesterly winds in the western half of these storms, coming directly from the interior, are often bitterly cold.

Tropical Cyclones.—Tropical cyclones, although much rarer than the extratropical variety, occasionally move northward in late summer and autumn. The storm centers generally move through the region in a northeastward direction toward and across Nova Scotia or over the adjacent ocean, but some have passed northward onto the southern New England coast. As a rule, these tropical storms are much more violent than the extratropical storms of the same season. Many of them have taken on some characteristics of extratropical cyclones before reaching the area, and are less intense than in more southerly latitudes.

HURRICANES.—Severe tropical cyclones of the North Atlantic Ocean are ordinarily referred to as West Indian Hurricanes, though actually many of these storms form, move, and die far out from the mainland and hundreds of miles from the West Indies. As a general rule these storms move with the prevailing winds of the area. In small hurricanes the diameter of the area of destructive winds may not exceed 25 miles while in some of the greatest storms the diameter may be as much as 400 to 500 miles.

At the center is a comparative calm known as the "eye of the storm". The diameter of this "eye" varies with individual storms and may be as little as 7 miles but is rarely more than 30 miles. The average is 15 to 20 miles. This center is the region of low atmospheric pressure around which winds blow in a more or less circular course, spiraling inward in a counterclockwise direction. Winds at the outer edge of the storm area are light to moderate and gusty, and often increase toward the center to speeds too high for instrument recording. Although the air movement near the center of the hurricane is usually light and fitful, the seas in this area are in most cases very heavy and confused, rendered so by the violent shifting winds which surround it. Furthermore, after the center has passed a vessel, she may expect a sharp renewal of the gales, with winds from a more or less opposite direction. The fully developed tropical cyclone may affect an area covering tens of thousands of square miles.

Tropical cyclones occur over all the tropical oceans except the South Atlantic. They usually form in the tropical regions of the easterly trade winds. In the North Atlantic, hurricanes form over a wide range of ocean between the Cape Verde Islands and the Windward Islands, over the western part of the Caribbean Sea, and the Gulf of Mexico. While some may initially move northward, especially those that form southeast of Bermuda, the majority take a westerly to northwesterly course. Of these, some curve gradually northward, either east of or above the larger islands of the West Indies, then turn northeastward or eastward for varying distances from the Atlantic Coast of the United States. Others pass over or to the south of the larger islands and enter the Gulf of Mexico, then curve northward or northeastward and strike some part of the east Gulf Coast. Others may continue westward and strike the west Gulf Coast.

The most common path is curved, the storms moving generally in a westward direction at first, turning later to the northwestward and finally to the northeastward. A considerable number, however, remain in low latitudes and do not turn appreciably to the northward. Freak movements are not uncommon, and there have been storms that described loops, hairpin-curved paths, and other irregular patterns. Movement toward the southeast is rare, and in any case of short duration. The entire Caribbean area, the Gulf of Mexico, the coastal regions bordering these bodies of water, and the Atlantic Coast are subject to these storms during the hurricane season.

Tropical cyclones can be expected from May through November. However, the months of greatest frequency are August, September, and October, when hurricanes are most likely to be severe. During all of the season the chance of an intense storm developing is great enough to warrant careful watch of the weather elements in this area. The June hurricanes which form in the West

Indian region usually move in a direction between west and north while they are south of 25° N. In late September, October, and November, hurricanes of this region are more likely to move in a direction between north and east, passing through the Yucatan Channel, or over Cuba, Florida, or the Bahamas. Of the hurricanes that come from the Atlantic into the West Indies, the majority occur in August and September. They generally move on a west-northwesterly course in low latitudes, some reaching the coast before curving toward the north and northeast. Late in the season, October or November, the movement of hurricanes that form east of the West Indies is often toward the north in the open Atlantic.

The average speed of movement of West Indian Hurricanes in the tropics is about 10 to 15 knots. This speed, however, varies considerably according to the location of the storm, its development, and attendant meteorological conditions. The highest rates of progression usually occur when the storm is moving northward or northeastward in the middle or higher latitudes.

Signs of approach.—One of the earliest signs of a hurricane is the appearance of high cirrus clouds which converge toward a point on the horizon that indicates the direction of the center of the storm. The snow-white fibrous mares' tails appear when the center is about 300 or 400 miles distant. Another usual early indication is a long, heavy swell propagated to a considerable distance, sometimes 2 or 3 days in advance, when there is no intervening land to interrupt it. This swell comes from the general direction in which the storm is approaching. There is usually a slight rise of the barometer at the outset, followed by a continuous fall. In front of the storm, if it is advancing in some westerly direction toward the observer, the winds blow from a northerly point (northeast, north, or northwest); if in some northerly direction toward the observer, they will blow from an easterly point (southeast, east, or northeast). A further indication is a rough, increasing sea. If one or more of these signs is lacking, there is little cause for anticipating a hurricane.

As the storm center approaches, the barometer continues to fall. The wind increases in speed and blows in heavy squalls, and the changes in its direction become more rapid. When facing the wind, the observer will find that the wind, in general, will back to the left during this time if the center is moving toward his left, or veer to the right if moving toward his right. Rain in showers accompanies the squalls, and when the center comes closer the rain is usually continuous and is attended by furious gusts of wind. The air is thick with rain and spume drift. Objects at a short distance are often hardly visible. If a vessel is on the line of the hurricane's advance, the wind will remain from the same direction, or nearly so, until the center is close to the vessel, or upon her.

Distance of hurricane center.—The distance from the center of a hurricane can be estimated from a consideration of the height of the barometer and the rapidity of its fall, and the velocity of the wind and the rapidity of its changes in direction. If the barometer falls slowly and the wind increases gradually, it may reasonably be supposed that the center is at a considerable distance. With a rapidly falling barometer and increasing winds, it may reasonably be supposed that the center is approaching dangerously near, the more so if the winds blow closely from the direction of the increasing swell.

Bearings of center.—If an observer faces the wind, the storm center will likely be located 8 to 12 points to the right in the northern hemisphere. When the storm is distant it may be 10 to 12 points, and when the barometer has fallen 5 or 6 tenths of an inch it may be nearer 8 points.

A line drawn through the center of a hurricane in the direction in which it is moving is called the storm track, or axis of progression. The semicircle on either side of the axis is called, respectively, the right-hand or dangerous semicircle and the left-hand or navigable semicircle.

If the wind shifts to the right, the vessel will be in the right-hand or dangerous semicircle with regard to the direction in which the storm is traveling. In such case the vessel should be kept on the starboard tack and increase her distance from the center.

If the wind shifts to the left, the vessel will be in the left or navigable semicircle. The helm should be put up and the vessel run with the wind on the starboard quarter, preserving the compass course, if possible, until the barometer rises, when the vessel may be hove to on the port tack. If there is not sea room to run, the vessel can be put on the port tack at once.

Should the wind remain steady and the barometer continue to fall, the vessel is in the path of the storm and should run with the wind on the starboard quarter into the navigable semicircle.

In all cases act so as to increase as soon as possible the distance from the center, bearing in mind that the whole storm field is advancing. In receding from the center of a hurricane the barometer will rise and the wind and sea will subside.

Practical rules.—When there are indications of a hurricane, vessels should remain in port or seek one if possible. Changes in barometer and wind should be carefully observed and recorded, and every precaution should be taken to avert damage by striking light spars, strengthening moorings, and if a steamer, preparing steam to assist the moorings. In the ports of the southern states hurricanes are generally accompanied by very high tides, and vessels may be endangered by overriding the wharf where moored if the position is at all exposed.

Vessels in the Straits of Florida may not have sea room to maneuver so as to avoid the storm track, and should try to make a harbor, or to stand out of the straits to obtain sea room. Vessels unable to reach a port and having sea room to maneuver usually observe the following rules:

When there are indications of the near approach of a hurricane, sailing vessels may heave to on the starboard tack. The safety of the vessel often depends on heaving to in time. Steamers may remain stationary. Both should carefully observe and record changes in wind, barometer, and swell so as to find the bearing of the cen-

ter, and to ascertain by the shift of the wind in which semicircle the vessel is situated.

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

In severe winters some of the harbors south of Cape Ann are closed to navigation by ice, and there is more or less drift ice in all the harbors, in Cape Cod Bay, and on Monomoy and Nantucket Shoals. In the principal harbors, steamers and tugs usually keep a channel open. See Ice under the different headings in the text.

Pilotage is not compulsory in the State of Maine, except for the port of Portland. See Pilotage under heading of Portland Harbor. Local pilots are available in other localities.

Pilotage is not compulsory for enrolled or registered vessels of the United States in ports of New Hampshire, and is compulsory for other vessels only when a pilot offers his service.

Pilotage is compulsory for ports in Massachusetts, except for coastwise steam vessels not sailing under register, vessels regularly employed in the coasting trade, fishing vessels other than whalers, and vessels of less than 7 feet draft. See also Pilotage under different headings.

Towboats are available at Belfast, Portland, Portsmouth, and Boston. At a number of other places power fishing boats and launches can be secured for handling smaller vessels and barges.

Harbormasters are appointed for most of the ports. They have charge of the anchorage and berthing of vessels.

Supplies.—Boston, Portland, and Portsmouth are the principal ports at which general supplies, provisions, and ship chandlery can be obtained. Coal is available at Boston, Lynn, Portland, Portsmouth, and Searsport. Boston, Portland, and Searsport have stocks of fuel oil. Diesel oil is available at Beverly, Boston, Gloucester, Portland, Rockland, and Boothbay Harbor. Yacht and small-boat supplies including gasoline are available at most of the smaller ports.

Repairs.—Boston is the only port where repairs of any magnitude to large vessels can be made. Portland is equipped for repairing vessels up to about 800 tons, while schooners, towboats, and fishing vessels can be repaired in Gloucester, Rockland, and Camden. Small motorboats and yachts can be hauled out, and ordinary repairs to machinery can be made at most of the smaller ports.

Standard time.—The region covered by this Coast Pilot uses Eastern Standard Time, which is 5 hours slow of Greenwich Mean Time.

Daylight saving time.—The clocks are advanced 1 hour the last Sunday in April and are set back to standard time the last Sunday in October in the region covered by this Coast Pilot.

4. QUODDY ROADS TO CALAIS, MAINE

Chart 801.—The approaches to St. Croix River include Quoddy Roads, Lubec Channel, Friar Roads, Head Harbor Passage, Western Passage, and Passamaquoddy Bay. The principal entrance is around the northern end of Campobello Island through Head Harbor Passage. This passage is deep and generally clear of dangers. The channel through Lubec Narrows is also frequently used, especially at high water. The tidal currents are strong in both passages.

West Quoddy Head, the easternmost point of the United States, is bold and wooded. **West Quoddy Head Light (44°48.9′ N., 66°57.1′ W.),** 83 feet above the water and visible 15 miles, is shown from a red and white horizontally banded tower, 49 feet high, on the eastern edge of the headland. The fog signal and radio beacon at the light are synchronized for distance finding. The Coast Guard lookout tower near the summit of the ridge westward of the light is the most conspicuous landmark in the approach to Quoddy Roads from seaward.

Between West Quoddy Head and Calais the United States-Canada boundary is defined by ranges which are white pyramidal-shaped markers that should not be mistaken for navigational aids.

Quoddy Roads, between West Quoddy Head and Canada's Campobello Island, is the usual anchorage for vessels seeking shelter or waiting for a favorable tide to pass through Lubec Narrows. The entrance, between West Quoddy Head and The Boring Stone, is about 0.8 mile wide and has a depth of 25 feet near the middle.

The anchorage affords shelter from northerly and westerly winds in depths of 12 to 25 feet, but is open to winds from the east and south, and protection from northeast gales is reported poor. The northern and western parts of the roads between Quoddy Head and Lubec are full of shoals which are partly bare at low water.

Sail Rock and **Little Sail Rock** are two bare rocks on a ledge about 0.2 mile southeastward of West Quoddy Head Light. The ledge extends more than 100 yards east of the two rocks. As swirls form just southward and eastward of Sail Rock during the strength of the tidal current, the rock should be given a good berth. A lighted whistle buoy is about 0.4 mile southeastward of Sail Rock, about in line with the rock and West Quoddy Head Light. A fairway bell buoy, about 0.5 mile north-northeastward of the light, marks the entrance to Quoddy Roads and the approach to Lubec Channel.

Round Rock and **The Boring Stone (Liberty Point Ledge)** are 500 yards southeastward of **Liberty Point,** a bold headland, which is the southern extremity of Campobello Island. These rocks show above water, and vessels should pass at least 300 yards off the southernmost rock. An islet about 200 yards off Liberty Point is conspicuous, as is **Owen Head (Ragged Point)** about 0.4 mile northeastward of it.

Wormell Ledges, partly bare at low water, are about 500 yards northward of West Quoddy Head, and are marked at their northern end by a buoy.

Middle Ground, with a least depth of 4 feet, is a shoal in the middle of Quoddy Roads. The shoal is 0.7 mile northward of West Quoddy Head, and is marked on its southwestern side by a buoy.

Above Middle Ground and Wormell Ledges, Quoddy Roads is full of shoals, mostly bare at low water, through which is the buoyed channel to Lubec Narrows.

Lubec Channel and **Lubec Narrows,** between Quoddy Roads and Friar Roads, have been improved by dredging. A Federal project provides for a channel 12 feet deep from deep water in Quoddy Roads to deep water north of Lubec Narrows. In July 1958 boatmen with local knowledge advised against taking vessels drawing more than 10 feet through this channel at low water. The channel is marked by a light and buoys. At spring tides the low water may be 3 or 4 feet below the average. Lubec Narrows has strong tidal currents and eddies. It is not advisable to use this passage without local knowledge.

Shoals bare on both sides of Lubec Narrows at low water. A breakwater extends from **Short Point** on the west side of the channel near the southern end of the narrows. The outer end is marked by a light. Another breakwater extends from shore to **Gun Rock** on the west side of the channel near the northern end of the narrows. This breakwater is not marked and is reported to be covered at extreme high water. A ledge extending about 150 yards north-northeasterly from Gun Rock, has 7 feet over it and is marked on its north end by a buoy.

Lubec (P.O.) is a small town on the west side of Lubec Narrows. Its principal industries are fishing, canning, and smoking of herring. There is little or no seaborne commerce.

The most **prominent features** are a large standpipe 1 mile southwest of the town, a tall church spire on the hill in the town, and an elevated tank and stack on the north shore of the town, all of which are visible from Friar and Quoddy Roads. A square red brick stack and three oil tanks are on Mowry Point south of the

town, with a prominent high school and its gymnasium about 500 yards westward of them.

U.S. Customs and **Immigration** officers are stationed at the ferry landing, where a small passenger and automobile ferry maintains regular daylight service to Campobello Island from June to September, and on call, as required, for the remainder of the year.

There are a number of fish and canning factories in the port with wharves, many of which dry at low water. Some, however, have from 4 to 10 feet alongside. Gasoline is available at the one immediately west of the ferry landing which has 6 feet alongside. Another wharf in the middle of town on the east waterfront, has a depth of 10 feet along a 190-foot face, and supplies water and diesel oil; it has a 4-ton crane.

The former steamer wharf, now used for storage of canned goods awaiting shipment by self-propelled lighters to Eastport, has a depth of 18 feet along a 200-foot face, but is not considered safe to lay at due to some projecting underpinning. There is a town wharf which dries at low water. Ice, food, and ship chandlery are available.

There are machine shops in the town which can handle repairs to gas and diesel engines; a ship's carpenter and electricians are available. There is a private marine railway, where craft from 50 to 65 feet in length can be hauled out, but usually, due to advantage of the large tidal range, craft are ground out for hull repairs.

The town has telephone and telegraph communication, but no public transportation, the nearest bus connection being at Whiting. There is a harbormaster but no local harbor regulations.

Pilotage is not compulsory, but a licensed pilot resides at North Lubec.

Johnson Bay, on the northwest side of Lubec, is a well-sheltered and frequently used anchorage. The approach from southward is through Quoddy Roads and Lubec Narrows, and the approach from northward is through Friar Roads. The best anchorage for deep-draft vessels is in depths of 42 to 54 feet just southward of a line from Mulholland Point Light to **Rodgers Island,** 0.8 mile northwest of Lubec.

The southwestern part of Johnson Bay is shoal for a distance of 0.5 mile from its head. A shoal with a depth of 17 feet over it is near the middle of the bay and another shoal with a depth of 11 feet is 350 yards off the eastern shore. The wharves of two fish factories on the northwest side and one on the east side of Johnson Bay bare at low water.

Popes Folly is a thinly-wooded islet 0.2 mile northward of the northern entrance to Lubec Narrows. The bar that extends southeastward from the islet to Campobello Island has a depth of 18 feet, and vessels bound southward to Lubec or through Lubec Narrows cross it. The ledge that extends northeastward from the islet is marked at its outer end by a buoy.

Dudley Island, 0.5 mile northwestward of the northern entrance to Lubec Narrows, is high and mostly grass-covered. An earth dam connects it with Treat Island, 0.2 mile to the northward.

Treat Island, largest of the islands between Lubec Narrows and Eastport, is high and grass-covered on the south end and wooded on the north end. **Burial Islet,** small and grass-covered, is 300 yards northwestward, and **Gull Rock,** bare at all times, is 400 yards westward of Treat Island. The former Government wharf on the west side of the island near its north end has a depth of about 14 feet alongside.

Broad Cove, which makes into the south shore of **Moose Island** west of Eastport, is a good anchorage. The head of the cove is shoal for a distance of 0.2 mile. Rocks, bare at low water, extend 400 yards southeastward and southward from **Shackford Head,** on the western side of the entrance, and are marked at their southeast end by a buoy. The stacks of the fish factories on the east side of the cove are conspicuous.

Deep Cove is the first cove to the northwestward of Broad Cove. A wharf in the cove is reported to have a depth of 26 feet at its head. The wharf head has collapsed and is in general disrepair.

Snug Cove on the west side of Campobello Island, to the eastward of Dudley Island, is of no importance except to small craft. Between Snug Cove and Dudley Island is a rock with a depth of 17 feet. Vessels entering Friar Roads from the southward pass on either side of the unmarked rock.

Friar Head, to the north of Snug Cove, is on the south side of the entrance to **Friar Bay,** on the western side of Campobello Island. Friar Bay is used as an anchorage, and on its northern side is the village of **Welshpool,** where small craft can find protection in all weather at the L-shaped wharf. There is good water at all stages of the tide at this wharf and vessels of moderate draft can lie alongside the head.

For a distance of 1.3 miles from Welshpool, the west shore of Campobello Island continues northward to **Bald Head,** a point just south of which is a prominent circular hill about 100 feet high. From Bald Head the coast trends northeastward 0.6 mile to **Man of War Head,** which is on the south side of the entrance to Harbour de Loutre. The wharf in the bight just west of Man of War Head has depths of 7 to 9 feet alongside.

Harbour de Loutre (Harbour Lute) is used as an anchorage by small vessels, but those without local knowledge should not go beyond the 9-foot spot, known as **Racer Rock,** in the middle of the entrance to the inner harbor. The inner harbor is obstructed by fishweirs. Indenting the north side of Harbour de Loutre east of **Windmill Point,** which is on the north side of the entrance, are four coves that are of little importance except to the fishing industry.

Friar Roads (Eastport Harbor), which lies between Moose Island and Campobello Island, is approached from northward through Head Harbor Passage and from southward through Quoddy Roads and Lubec Narrows. Friar Roads is the principal approach to Passamaquoddy Bay and St. Croix River.

Eastport, a city situated on the hilly east side of Moose Island, is the easternmost deep-water port in the

United States. The docks of the port are along the waterfront on the east shore of the island. There is no seaborne commerce with the exception of some canned goods carried by self-propelled lighters from Lubec for trans-shipment by rail from Eastport.

The principal industries are fishing, with its attendant phases of canning and smoking of herring, and manufacture of the by-products of fish oil, meal and fertilizer, and some lobstering. Berry canning is carried on in season.

The principal **landmarks** are: a green painted standpipe, yellow brick high school, the storm warning signal tower on the summit of the hill overlooking the town, the customhouse with its square tower and two flagpoles, the prominent spire of a church, and the stacks of the many canneries along the waterfront and about the island. These stacks, however, are so numerous as to be confusing to the mariners. The numerous concrete pylon boundary markers on the tops of the hills are also conspicuous and are not charted.

Anchorage is available in Friar Roads off the town. The best anchorage is reported to be off the customhouse. In clear weather good marks for this anchorage are the white pyramidal tower of the fog bell on the southeast end of Cherry Island and a range of the customhouse tower and the standpipe on the hill in line. The bottom is uneven, and the currents have an average velocity of about 3 knots at strength. In unfavorable weather vessels anchor off Broad or Deep Coves or in Johnson Bay.

Dangers off Eastport include: **Page Rock,** with a depth of 16 feet; **Margie Rock,** with a depth of 14 feet; and a 13-foot spot about 325 yards north of Margie Rock. All are east of the town and unmarked. The stone and concrete foundation of a former wharf between the Customs Wharf and the Wadsworth Wharf and a rock filled crib, the remains of another wharf, about 150 feet north of the Wadsworth Wharf, are both visible at low water. Both of these unmarked dangers extend about 40 feet beyond the line of the face of the Wadsworth Wharf. **Clark Ledge,** about 200 yards eastward of the wharves in the northern part of Eastport, is covered at high water and is marked by a daybeacon.

Dog Island, 0.3 mile northward of Clark Ledge, has a grassy top and has a shelving ledge extending about 100 yards off the high waterline of the island. **Dog Island Light (44°55.1′ N., 66°59.4′ W.),** 32 feet above the water and visible 11 miles, is shown from a white skeleton tower. A red sector in the light covers Clark Ledge; a fog signal is at the light.

Whirlpools and eddies that are dangerous at times for small boats are encountered between Dog Island and Deer Point, 0.5 mile northeastward. They are reported to be worst about 3 hours after low water.

The mean range of **tide** at Eastport is about 18 feet. Daily tide predictions are given in the Tide Tables.

See Appendix for **storm warning** displays.

Pilotage is not compulsory. A licensed pilot resides at North Lubec. Pilots for local inside waters can also be found among the boatmen at Lubec or Eastport. Towboats are not available but small launches can be hired for light tows.

Eastport is a **customs port of entry** at which marine documents are issued. The town has an immigration and naturalization office. Quarantine is arranged through the collector of customs.

There are a number of cannery and private wharves in the port, many of which are dry at low water. The former steamer wharf, now the Railway Wharf, has a reported depth of 21 feet along its 200-foot face. It has a rail siding and transit shed and two 1½-ton gantry cranes. The former railroad wharf, adjacent to it, is in disuse, with the transit shed and rail siding removed. There is reported to be a depth of 8 feet at this wharf. The Wadsworth Wharf has 9 feet at its outer end.

Water can be supplied at the Railway Wharf and the large cannery wharf near the customhouse.

Gasoline, diesel oil, provisions, ice, and ship chandlery are available. A machine shop in the port can handle repairs to any size gasoline, diesel, or steam engine. Electrical repairs and welding can be carried out. Small vessels are usually ground out at high water for hull repairs, but there are private facilities for hauling out craft up to 60 feet in length.

Eastport has no coastwise steamer service. An automobile ferry connects Eastport with Deer Island; and a Canadian motor vessel carries mail, passengers, and freight between Eastport, Deer Island, Campobello Island, and St. Andrews. A small launch carries passengers from the port to Wilson Beach on Campobello Island.

There is a railroad spur line to Eastport but no passenger service. The nearest bus connection is at Perry, 7 miles north. A good highway parallels the St. Croix River to Calais. There is an airport at Eastport which is seldom used. It has a seaplane ramp which is used mostly for grounding out and storage of small craft. There is telephone and telegraph communication.

Western Passage is between Moose Island and **Deer Island,** the next large island northwestward of Campobello Island and connects Friar Roads with Passamaquoddy Bay. **Deer Island Light,** 35 feet above the water, is located on the southern extremity of the island. The light is exhibited from a pole and is not easily seen in the daytime. Strangers coming up Friar Roads are apt to take the white wooden fog signal tower on the southeastern end of Cherry Islet for a light structure.

Johnson Cove and **Kendall Head** are on the northeast side of Moose Island. An elevated tank painted green, just southward of Johnson Cove, an elevated tank and a ground tank, close northwestward of it, at **Quoddy Village,** are all prominent, as is the stack and wharf of a cannery on the northwest shore of the island, in Bar Harbor.

Earth dams block the shallow passages north and south of **Carlow Island,** which is 0.2 mile north of Moose Island and 0.6 mile south of **Pleasant Point.** On the point are a prominent red brick church with square belfry and numerous houses of an Indian reservation.

Frost Island and **Frost Ledge** are at the northern end

of Western Passage and between Pleasant Point and **Gleason Cove**, 0.9 miles to the northward. Frost Ledge extends nearly 0.4 mile offshore and is marked by a bell buoy. Between Carlow Island and Frost Island, foul ground extends as much as 400 yards from shore.

The northeastern, or Deer Island, shore of Western Passage is clear; indentations are **Cummings Cove** and **Clam Cove.**

The main route into Passamaquoddy Bay and St. Croix River is north of Campobello Island through Head Harbor Passage, Friar Roads, and Western Passage.

The east coast of **Campobello Island** is mostly clear and can be approached to within a reasonable distance without danger.

Local magnetic disturbance.—Differences of as much as 5½° from the normal variation have been observed off the east coast of Campobello Island.

Herring Bay, near the south end of Campobello Island's eastern shore, is a good temporary anchorage for large vessels. **Schooner Cove**, midway along the eastern shore, and **Mill Cove**, near the northern end, afford temporary anchorage for small craft. A 14-foot spot in the middle of the entrance to Mill Cove is marked by a buoy.

East Quoddy Head is the northeasternmost point of Campobello Island. **Head Harbor Light (44°57.5′ N., 66°54.0′ W.)**, 64 feet above the water and visible 13 miles, is shown from a white octagonal wooden tower, with a red cross, a red iron lantern, and an attached dwelling, on the outermost rock. The fog signal is on a small building just north of the light.

Head Harbor, between East Quoddy Head and **Head Harbor Island**, 0.2 mile to the southeastward, affords good anchorage for small vessels, and winter storage for small vessels.

Wilson Beach, on the northwest side of Campobello Island and about 2 miles southwestward of East Quoddy Head affords good protection in all weathers at the wharf, which has 30 feet of water alongside. The light on the end of the pier is shown from a pole and is not easily seen in daytime from any distance.

Head Harbor Passage is a deep and clear fairway, about 4 miles long, that follows the northwestern side of Campobello Island from the sea to Friar Roads, opposite Eastport, where it joins Western Passage. The route through Head Harbor Passage and Western Passage is the one usually followed by vessels going to Passamaquoddy Bay and St. Croix River.

White Horse Island, bare, rocky and 68 feet high, is about 2.3 miles northeastward of East Quoddy Head. The islet has a whitish appearance, is easily identified, and is a good mark for the approach to Head Harbor Passage.

East Rock, 300 yards northeastward of White Horse Island, is covered 1 foot. Another rock, with a depth of less than 6 feet, is 200 yards northward of East Rock. **North Rock**, steep-to and covered 1 foot, is about 0.5 mile northwestward of White Horse Island. All are unmarked.

White Island, 1.6 miles northward of East Quoddy Head, has fringing shoals that extend as much as 400 yards from shore. A group of islets and shoals 0.5 mile northwestward of the island includes **Nubble Island**, the **Spectacles**, and **Hospital Island.**

Spruce Island, 0.8 mile north of East Quoddy Head, is steep-to on its eastern side. Islets and shoals extend 0.8 mile westward of the island. The westernmost of these dangers, **Tinker Island Ledge**, is marked by a daybeacon, as is a rocky shoal about 500 yards northeastward of **Tinker Island.**

Black Rock, small and bare, is 0.8 mile northwestward of East Quoddy Head and 0.6 mile southwest of Spruce Island.

Casco Island, 0.5 mile southwestward of Black Rock and 0.5 mile from the nearest part of Campobello Island, is 85 feet high. The eastern side of the island is fairly steep-to, but ledges extend 300 yards off its northern end. Several shoals and ledges are within 0.3 mile of the western side of the island. A daybeacon has been erected on one of these ledges.

Green Islet is about 0.4 mile southwestward of Casco Island. An unmarked 27-foot shoal, near the middle of Head Harbor Passage, is 600 yards southeastward of Green Islet and 0.4 mile from the shore of Campobello Island. **Sandy Ledge**, 400 yards westward of Green Islet, is marked by a daybeacon.

Pope Islet is 0.5 mile southwestward of Green Islet. Shoals extend 300 yards southwestward of Pope Islet, and an unmarked 28-foot shoal is about 700 yards southeastward of the islet. About 0.4 mile westward of Pope Islet is **Chocolate Shoal**, which has a depth of 9 feet.

Indian Island is 90 feet high near its northern end and is 0.4 mile eastward of Deer Point, the south end of Deer Island. The channel between Indian and Deer Islands is deep. A shallow bank, on which are three islets, extends about 500 yards off the southeastern part of Indian Island. **Cherry Islet**, at the southeastern end of this bank, has a white square pyramidal wooden building, 47 feet high, from which a fog bell is sounded. The structure might easily be mistaken for a light structure at a distance.

Passamaquoddy Bay is the large indentation in the shore of New Brunswick east of the mouth of St. Croix River. The principal entrance is by way of Western Passage which has deep water and is comparatively free from dangers. The bay has been swept with wire drag and all dangers are charted.

Letite Passage, the most northerly entrance to Passamaquoddy Bay, is the channel between **McMaster Island** and the mainland. Although the channel has deep water, navigation is difficult because of unmarked dangers and strong tidal currents. Passage should not be attempted without local knowledge.

Letite Rock is in the middle of the northwestern end of the passage, and an unmarked 18-foot spot is halfway between Letite Rock and the north end of McMaster Island. Another 13-foot spot about 600 yards south-southwestward of Letite Rock also is unmarked. An

overhead power cable with a clearance of 140 feet crosses Letite Passage in a northeasterly direction from the northeasternmost point of McMaster Island.

St. Andrews, a Canadian town in the east side of the entrance to St. Croix River, is a railroad terminus and has some commerce. A large hotel with a red roof and tower is prominent.

A dredged channel, with a depth of about 9½ feet and marked by buoys, leads to St. Andrews from the southeastward. Another channel, Western Gut, to the westward of the town has a depth of about 6 feet and is marked by buoys. The anchorage, between the town and **St. Andrews (Navy) Island,** can be used only by light-draft vessels.

The railroad wharf at **North Point,** on the south side of the town, is reported to have depths of 10 feet alongside. The 848-foot Government wharf with depths of 10 to 13 feet at its face is about 0.4 mile westward of the railroad wharf. Gasoline and some supplies are available in the town.

St. Croix River extends north-northwestward for 8 miles from the southern part of Passamaquoddy Bay, then turns westward between **Devils Head** and **Oak (Todds) Point.** The channel is deep and comparatively clear as far as the turn, then is narrow and winding, and has a controlling depth of about 12 feet for some 3 miles to Hills Point.

A Federal project provides for a channel 12 feet deep from Hills Point to the Lower Steamboat Wharf at Calais, thence 9 feet deep to the upper wharf at Calais. The channel is not maintained.

In July 1958 is was reported that the channel above Todd Point had shoaled to 1 foot in places. The channel is marked by lights and buoys. The two buoys on the north side of the channel at **The Narrows,** opposite **Whitlock Light,** tow under during the strength of the tide.

Small craft up to 40 feet in length can anchor in 14 feet on the west side of the channel just above **Whitlock Mill,** but larger craft should anchor below Oak Point. The scattered remains of an old breakwater, bare in spots at ⅓ tide, extend southeastward across the mud flats for about 300 yards from the daybeacon on the south side of the river opposite The Ledge.

Tides.—The mean range of the tide is about 19 feet at Robbinston and 20 feet at Calais.

Ice.—From January to March, St. Croix River is obstructed by ice, and usually is not navigable above Robbinston, but the channel to the oil wharves at Calais is sometimes kept open by Coast Guard ice breakers. Quoddy Roads and Eastport Harbor are never closed by ice.

Freshets.—Spring freshets sometimes cause the water to rise above the level of the wharves at Calais and are accompanied by strong currents. They are seldom noticeable outside of the river.

South Robbinston is at the head of **Mill Cove,** an unimportant bight on the west side of the mouth of the St. Croix River.

Liberty Point is 0.7 mile northward of Mill Cove.

Robbinston (P.O.) is a village just above Liberty Point. There is a prominent yellow brick stack of a former fish cannery, about 0.75 mile above the point. About 300 yards southward of this stack, is a red brick chimney and large green painted cannery building with a wharf at which there is reported to be a depth of 14 feet.

A seasonally-operated car ferry runs during daytime from the cove at Robbinston to **Joes Point** on the Canadian side of the river. Custom and immigration officers are in attendance while the ferry is operating.

On the Canadian side of the river, about 0.3 mile above Joes Point, the 3-story brick and concrete building and wharf of the Atlantic Biological Station of the Fisheries Research Board of Canada are conspicuous. The Schoodic Yacht Club, of Calais, is at **Red Beach** (P.O.) 3 miles north of Robbinston.

St. Croix (Dochet) Island is in midriver off Red Beach. **St. Croix River Light (45°07.7′ N., 67°08.1′ W.),** 101 feet above the water, is shown above a platform on a white tubular steel tower on the island. A directional light, about 1 foot below the top light shows an intensified beam downriver on the bearing 334°. The white wooden structure of a former fog signal is on the west side of the island. St. Croix Island was made a National Park in July 1949.

Scattered shoals, sunken and awash, that fringe the island and extend southward 1.1 miles in midriver, are marked by buoys. The deeper and broader channel is eastward of the island and the shoals. The channel between the shoals and **Little Dochet Island,** a wooded islet midway between the southern end of the shoals and the western shore, is used considerably by local vessels, but it is not advisable for strangers to use it as the dangers are not marked.

Calais is a small city on the south bank of St. Croix River, about 14 miles above the river mouth and 24 miles from Eastport. The city has no waterborne commerce, with the exception of oil deliveries. It is a railroad freight terminus and has a few industrial plants, berry packing plants, and a paper mill. There is a hospital. The fixed highway bridge, between Calais and St. Stephen, is the head of navigation on St. Croix River.

All the wharves are dry at low water; few are in usable condition. About a mile below the bridge, are two oil docks, at which small coastal tankers usually of 13-foot draft lie in the mud while discharging between tides.

Calais is a **customs port of entry** at which marine documents are issued. The Customhouse is at the American end of the bridge, as is the immigration office. The railway passenger service has been discontinued but the city is served by a bus line from Boston. There is telephone and telegraph communication. There is no harbormaster and no known local harbor regulations in force.

St. Croix Boat Club is on the south bank at **Todd Point.** There is a gravel ramp there for launching small craft. A public wharf and float landing, dry at low water, is maintained from June to September at St. Stephen.

There are no facilities on the American side of the river for servicing small craft, but gasoline, provisions, and some supplies can be obtained in town. Small fishing craft are reported to go up river at high water as far as the milldam about 0.5 mile above the International Bridge at Calais.

Pilotage is not compulsory. A pilot licensed for the river resides at North Lubec.

St. Stephen is the Canadian town on the opposite side of the river from Calais. A large fertilizer plant 0.8 mile east of the bridge has a wharf where vessels load and unload at high water. Gasoline, oil, and water are piped to the wharf. Provisions of all kinds and small amounts of deck and engineroom stores can be obtained. Minor repairs can be made by various machine shops in the town. The town has a large textile plant, good hospital, telegraph office, rail, and bus connections.

Cobscook Bay, extending westward from Moose Island, is large and irregular and has several arms. The approach channel is between Moose Island and **Seward Neck,** about 0.6 mile southwestward. Local knowledge is needed to navigate the arms of the bay because of the numerous rocks and dangerous currents.

The deepest draft using Cobscook Bay is 14 feet. Strangers seldom enter, but those that do take a pilot. A licensed pilot, who resides at North Lubec, will board at Eastport, Lubec, or West Quoddy head.

Good anchorage can be found in many of the arms or coves in Cobscook Bay, but in most of the channels the currents are too strong and the bottom is too rocky. In the winter, ice obstructs navigation near Whiting and Dennysville, and in severe winters other parts of the bay also are affected.

Bar Harbor, northwest of Moose Island, can no longer be used as a shortcut between Cobscook Bay and Western Passage because the eastern passages north and south of Carlow Island have been closed by earth and rock dams.

A fixed bridge over the western entrance to Bar Harbor has a clearance of about 5 feet. This bridge has been closed to vehicular traffic and an overhead power cable is now carried on poles along the centerline of the bridge. The water main to Eastport also crosses on the north stringer of the bridge.

Pennamaquan River empties into Cobscook Bay from northwestward about 4 miles west of Moose Island. The river has ample depth for about 1.7 miles above the entrance, and the principal dangers are marked by buoys. Low-water flats extend 0.8 mile downstream from **Pembroke** (P.O.), a town 3 miles above the mouth of the river.

The deepest draft vessels now using Pennamaquan river are the coastal oil tankers carrying 14 feet to the oil wharf on **Hersey Neck,** about 1 mile west of **Garnet Point,** the southeastern extremity of Hersey Neck. There is reported to be a depth of 18 feet at this wharf.

At **West Pembroke** (P.O.), about 0.8 mile southwest of Pembroke and on the northwest prong of the Pennamaquan River, is a fish factory with a wharf to which it is reported that a draft of 12 feet can be carried at high water.

Dennysville (P.O.) is a village at the head of **Dennys Bay,** which empties into the western end of Cobscook Bay from northwestward about 6 miles west of Moose Island. Low-water flats extend 0.5 mile below the town, which is about 4 miles from the mouth of the bay.

The fixed bridge of the relocated highway (U.S. No. 1) which crosses the river about 0.5 mile below the town is the head of navigation for the **Dennys River.** There is no waterborne commerce. The river is now only important as a salmon fishing stream.

Whiting (P.O.) is a village at the head of **Whiting Bay,** which empties into the western end of Cobscook Bay from southward. Low-water flats extend 1 mile below the town. With local knowledge, a draft of 12 feet can be carried to Whiting, at high water. The channel is unmarked and difficult to follow.

Currents.—In Grand Manan Channel, the flood current sets in a general northeast direction and attains a velocity of about 2.8 knots at strength. The ebb sets in a southwesterly direction with a velocity of about 2.2 knots at strength. Daily predictions of the times of slack water and times and velocities of strength of flood and ebb are given in the Tidal Current Tables.

If less than 2 miles from the northern shore when approaching the entrance to Quoddy Roads, the set of the flood currents is more northward, and about 1 mile southeastward of West Quoddy Head the flood sets directly into the roads. For a distance of 0.5 mile southeastward of West Quoddy Head the currents are dangerous because of swirls and eddies which, in a light breeze, are apt to draw a vessel onto Sail Rock.

Along the eastern side of Campobello Island the flood current follows the trend of the shore in a northeasterly direction and the ebb sets in the opposite direction.

In Head Harbor Passage the tidal current is said to attain a velocity of 5 knots at times. The flood sets strongly westward toward the islands about 1 mile northward of Campobello Island. The direction of the flood then changes more southward, following the general direction of the passage until nearly to Eastport, where the set is more westerly, toward the passage between Deer and Moose Islands, and toward the entrance to Cobscook Bay. The ebb generally sets in a reverse direction.

Through Lubec Narrows, the flood current sets northward, following the general trend of the dredged channel; southward of the narrows it has a velocity of about 4 knots at strength; but in the narrows it attains a velocity of about 6 knots during spring tides. The ebb sets southward, following the general direction of the channel, and in the narrows has a velocity of about 8 knots during spring tides. Below the narrows its velocity is about 4 knots, and the set is in the general direction of the channel. The currents at strength form dangerous

eddies on both sides of the channel in the narrows; these are avoided by keeping in midchannel. The duration of slack in the narrows is only 5 to 15 minutes.

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

The flood current sets northward into Western Passage; and off Deer Point, abreast Dog Island, it forms whirlpools and eddies which are dangerous to open boats. The whirlpools and eddies are strongest 2 to 3 hours before high water and during spring tides; the flood then attains a velocity of about 6 to 7 knots. The least disturbance is usually about 300 yards northward of Dog Island, where there is a comparatively narrow direct current which can be readily followed between the whirlpools and eddies on either side. The ebb sets southward but is weaker than the flood.

Above Deer Point the flood sets northward with decreasing velocity and follows the general direction of the channel with strong countercurrents and eddies close to the shore, where the configuration of the land is favorable. The ebb sets southward with reduced velocity and disturbance off Deer Point, and the inshore reverse currents are less marked than on the flood. For predictions, the Tidal Current Tables should be consulted.

In the St. Croix River, the flood current sets northward with countercurrents inshore on both sides where the conformation of the land is favorable for them. The ebb sets southward with less marked countercurrents. The tidal current normally attains a velocity of about 2 knots between the mouth of the river and Devils Head and 3 to 4 knots between Devils Head and Calais.

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

5. QUODDY ROADS TO PETIT MANAN ISLAND, MAINE

Chart 1201.—Grand Manan Channel leads along the coast of Maine, between it and Grand Manan Island, and is an approach from westward to Quoddy Roads and Passamaquoddy Bay. It is the most direct passage for vessels bound up the Bay of Fundy from along the coast of Maine. The channel varies in width from 5.5 miles abreast Campobello Island to 10 miles abreast Southwest Head, the southwestern point of Grand Manan Island. The western approach is marked by Machias Seal Island Light, which also marks the westermost of the rocks and ledges that lie southwestward of Grand Manan Island. With the exception of the dangers between Machias Seal Island and Grand Manan Island, the channel is free and has a good depth of water. The tidal current at strength has an average velocity of about 2.5 knots and follows the general direction of the channel. Off West Quoddy Head the currents set in and out of the roads, forming strong rips. Sailing vessels should not approach West Quoddy Head too closely with a light wind.

It is reported that the fogs often hang close in to the Maine coast between Machias Bay and West Quoddy Head, extending about one third the way across Grand Manan Channel, while the rest of the passage may be entirely clear of fog.

Machias Seal Island, 10 miles southwestward of Southwest Head, the southern extremity of Grand Manan Island, is about 500 yards long and 28 feet high. **Machias Sea Island Light (44°30.1′ N., 67°06.2′ W.),** 82 feet above the water and visible 14 miles, is shown from a white octagonal concrete tower on the summit of the island; a fog signal is at the light. The island is steep-to on its western side. A drying reef, on the end of which is an islet, extends 0.4 mile northeastward. A sunken rock is about 300 yards northward of the islet. Depths of 22 feet 0.7 mile eastward and 32 feet 1.2 miles east-northeastward of the light are unmarked, as is a 14-foot shoal, marked by a tide rip, about 0.3 mile southeastward of the island.

Southeast Shoal, 1.2 miles southeastward of Machias Seal Island, has a depth of only 9 feet over it. This shoal breaks in heavy weather, and shows a rip during the strength of the tidal current, which reaches a velocity of 3 knots.

North Rock, 2 miles northward of Machias Seal Island, is about 4 feet high and is surrounded by shoal water to a distance of 400 yards.

North Shoal, 1.5 miles northward of Machias Seal Island, has a least depth of 9 feet, with depths of 42 feet 0.25 mile north-northwestward, and 24 feet, 0.2 mile south-southwestward of the 9-foot spot, which breaks in heavy weather, with the whole area marked by tide rips.

Middle Shoal, 5 miles northeastward of Machias Seal Island, has a depth of 17 feet over it, with deep water close-to. The shoal shows a tide rip, and breaks in heavy weather.

Bull Rock, about 7 miles eastward of Machias Seal Island, is awash at low water and usually breaks. It is surrounded by deep water. A rocky patch, with a depth of 30 feet, on which there is a tide rip, is about midway between Bull Rock and Machias Seal Island.

Local magnetic disturbance.—Magnetic disturbance has been reported in the vicinity of latitude 44°31.5′ N., longitude 66°55.0′ W.

Southeast Ledge, nearly 6 miles southeastward of Machias Seal Island, has a depth of 26 feet, shows a tide rip, and breaks in heavy weather. A 38-foot patch, marked by tide rips, is 1.4 miles northwestward of this ledge.

Wallace Ledge, the northernmost of the Murr Ledges and 3.2 miles northeastward of Bull Rock, dries 8 feet.

Eastward of this area are numerous reefs and ledges which are shown on chart 1106 and Hydrographic Office chart 1057. These dangers are beyond the limits of chart 1201 and are described in H.O. 99 Sailing Directions for Nova Scotia. Some of the dangers are **Murr Ledges, Halftide Rock, St. Mary Ledge, Yellow Ledge, Cross Jack Ledge, Long Ledge, White (West) Ledge,** and Gannet Rock. **Gannet Rock** is about 15 feet high and is marked by **Gannet Rock Light (44°30.6′ N., 66°46.9′ W.),** 106 feet above the water and visible 16 miles, shown from a red lantern on an octagonal wooden tower painted in black and white stripes; a fog signal is at the light.

Chart 303.—The coast between West Quoddy Head and Moose Cove is in general rocky, wooded, and steep-to, and is indented by several coves of slight importance. Along this stretch of coast from West Quoddy Head to Long Point, and particularly off Jims Head, a very rough sea builds up quickly when the wind is contrary to the tidal current and small craft may find themselves beset and unable to make the shelter of the coves without assistance.

Boundary lines of inland waters.—The lines established for this section of the New England Coast are described in **§ 82.5,** Chapter 2.

Carrying Place Cove, just westward of West Quoddy Head, has a few buildings at its head. **Wallace Cove,** 0.6 mile southwest of Carrying Place Cove, and **Hamilton Cove,** 1.8 miles southwest of Carrying Place Cove, have no distinguishing features. About halfway between Wallace and Hamilton Coves and 500 yards offshore is

Morton Ledge, with a depth of 6 feet. The ledge is marked by a buoy. **Boot Cove,** 1 mile southwest of Hamilton Cove, has a few small fishermen's houses at its head.

Baileys Mistake, 5 miles southwest of West Quoddy Head, appears from offshore to be a good anchorage, but the holding ground is poor and it is not a good harbor, although a few fishing boats moor here. There are three wharves in the cove; one on the east side, half way up the cove; and two on the western head of the harbor, where there is also a herring smokehouse. A conspicuous white house and a white church steeple are on the slope in the village of **South Trescott** at the head of the harbor. **Bailey Ledge,** bare at low water, obstructs the western half of the entrance. A buoy marks the southern side of the ledge. **Jims Head,** on the northeastern side of the entrance, is 160 feet high and prominent. A whistle buoy is off the head.

The head of **Haycock Harbor,** which is known locally as **The Pool** and is just southwest of Baileys Mistake, is sometimes entered at high tide by small craft; the shelter is excellent. The depth inside is reported to be 7 feet. **Sandy Cove** is an open bight just southwest of Haycock Harbor.

Eastern Head, with a 200-foot hill behind it, is the eastern extremity of the north shore of Moose Cove, 7.5 miles southwest of West Quoddy Head. About 0.5 mile west of Eastern Head, **Mink Island** and **Eastern Head Ledges,** bare at low water, extend over 400 yards offshore. **Moose River** is at the head of Moose Cove. There is a small wharf on the south side of the river at its narrowest point. On the north side of the river a rocky spit makes out, forming a natural shelter for small boats.

From Moose Cove to Little River, a distance of about 6 miles, the coast has no features of importance. The several open, shallow coves include **Bog Brook, Holmes, Black Point,** and **Long Point Coves.** Just north of Little River are **Hughes Beach** and **Money (Schooner Brook) Cove.**

Little River is 14 miles southwestward of West Quoddy Head and about 8.5 miles northeastward of Libby Islands. In the middle of the entrance is **Little River Island,** which is wooded and has rocky sides. **Little River Light (44°39.0′ N., 67°11.5′ W.),** 57 feet above the water and visible 13 miles, is shown from a white conical tower on the northeast corner of the island; a fog signal is at the light. A bell buoy, about 0.5 mile east-northeastward of the light marks the entrance to the harbor.

A tree covered islet on the north side of the entrance, about 350 yards north of Little River Island, and two tree covered islets off Western Head, on the south side of the entrance, are conspicuous. About 0.6 mile up the harbor from the island, on the prominent point on the south side, there is a conspicuous white house; and on the north side, about the same distance in, there is a conspicuous white building with a cupola.

Little River is small but is easy of access and is an excellent harbor of refuge, sheltered from all winds and with depths of 12 to 30 feet, good holding ground. The channel leads northward of the light and has a depth of about 28 feet. The anchorage, just inside of Little River Island, is about 0.5 mile long and 0.2 mile wide. The harbor is never obstructed by ice to such an extent as to prevent vessels from entering.

Eastern Knubble is the point on the northern side of the entrance to Little River. Just south of Eastern Knubble and 100 yards offshore is **Little River (Eastern Head) Ledge** which bares at low water and is marked by a buoy. A ledge extends 100 yards from the south shore, just eastward of a prominent point 0.5 mile above Little River Island. With these exceptions, there are no dangers in the harbor if the shores are given a berth of 100 yards. Care should be taken in entering to stay in midchannel because of the fishweirs, often covered at high water, that extend a considerable distance from the shores. Numerous mooring piles are in the harbor and a lobster car some distance off the large wharf.

To enter Little River, pass northward of Little River Island, giving it a berth of 100 to 200 yards. Anchorage can be selected anywhere in midchannel inside the island. Small local craft anchor off the wharves in depths of 6 to 18 feet. The passage southward of Little River Island has a rocky bar across it with a least found depth of 10 feet in midchannel. This passage should not be used by strangers.

Cutler (P.O.) is a village on the north shore of Little River. Many fishing vessels and lobster boats base at the harbor, and it is a popular yachting haven. There are two wharves with float landings; at the largest and westernmost of these, there is reported to be a depth of 15 feet. Gasoline and diesel oil is available at this wharf and gasoline at the other. Food supplies and some ship chandlery are available. Water can be obtained from a pump at a waterside restaurant close eastward of the large wharf. There is telephone and telegraph communication, and good roads lead to East Machias and along the shore to Lubec. A harbormaster supervises the moorings.

Between Little River and Little Machias Bay there are no features of importance. **House Cove,** 0.6 mile west of **Western Head,** the point on the south side of the entrance to Little River, is a small, open bight extending somewhat behind **Great Head. Deer Island,** 1.7 miles west of Western Head, is a small island close to shore. About 0.3 mile offshore in this vicinity is a series of ledges on which depths as shoal as 13 feet are found.

Little Machias Bay, 2.5 miles west of Little River, is not used for an anchorage as it is exposed to southerly and southeasterly winds and is close to Little River and Machias Bay, both excellent anchorages. Little Machias Bay is 0.6 mile wide at the entrance, wider inside, and about 2 miles long. **Black Ledges** are bare islets in the middle of the entrance to the bay with deep water close-to on both sides. **Long Ledge,** in the middle of the bay 1 mile inside the entrance, is covered at high water. Above Long Ledge the bay is much obstructed by shoals

and ledges, two of which are **Upper Ledge** and **Widows Ledge.** Fishweirs are numerous in the bay. There are some houses on the shores of the bay but no wharves except for small craft at high water. **North Cutler** is a settlement on the north shore of the bay, where a white church with belfry is conspicuous.

Old Man is a small but conspicuous rocky island, grassy on top, 1 mile off the entrance to Little Machias Bay. The island is a good mark and may be safely approached as close as 400 yards.

Cape Wash and **Cape Wash Island** are on the western side of the entrance to Little Machias Bay. Reefs extend about 400 yards south of the islands. Just westward of Cape Wash are **Holly Cove** and **Little Holly Cove,** which are important only to small craft. The peninsula as far north as Sprague Neck and North Cutler is a naval reservation.

Cross Island is the large wooded island on the east side of the main entrance to Machias Bay. A few unpainted shacks on low, flat **Grassy Point,** the northern extremity of the island, are prominent when approaching Cross Island Narrows from westward. Cross Island Coast Guard Station is on the northeastern end of the island. See Appendix for **storm warning** displays. Small thickly wooded **Mink Island** is 0.2 mile off the northeast shore of Cross Island. From seaward, the most conspicuous mark on Cross Island is a skeleton lookout tower on a hill at the eastern end.

Cross Island Narrows is a channel leading into Machias Bay northeast of Cross Island. **Thornton Point** and **Quaker Head** are on the northern side of the passage. The channel is much obstructed by rocks, sunken or awash at various stages of the tide, and should not be used without local knowledge. Small craft can go through the narrows by closely following the chart and not placing too much reliance on the floating aids, which are apt to drag from station during heavy weather. **Dogfish Rocks,** about 350 yards northward of Grassy Point, are bare at low water.

Cross Island Narrows are seldom obstructed by ice in the winter, and consequently the cove southwestward of Mink Island is much used as a winter anchorage by small fishing boats.

Northwest Harbor, a bight in the northwestern shore of Cross Island, has depths of 21 to 54 feet, but is little used as an anchorage.

Chart 304.—Machias Bay, about 21 miles southwestward of West Quoddy Head, is the approach to Machias River, and the towns of Machiasport and Machias. The bay is about 6 miles long and 1 to 3 miles wide, is easily entered day or night, and affords well sheltered anchorage for large vessels. The main entrance is between Cross Island on the east and Stone Island on the west, and is about 2 miles wide.

Libby Islands, in the middle of the entrance, are two flat grassy islands connected by a bare ledge. Sunken ledges extend about 300 yards off the southern end of the southwestern island and about the same distance off the eastern shores of both of the islands.

Libby Island Light (44°34.1′ N., 67°22.1′ W.), 91 feet above the water and visible 15 miles, is shown from a white granite conical tower on the southwestern island. A fog signal is at the light. The light is obscured between the bearings 208° to 220°. The light is the principal guide to the entrance to Machias Bay. This light and the buildings of the light station, the numerous radio towers on Cutler Peninsula northward of Cape Wash, and the domes of the four radar towers on Howard Mountain, are the most prominent objects in the area.

Several vessels have been wrecked on the eastern side of Libby Islands during thick weather, indicating a possible dead zone to the eastward.

Avery Rock is in the middle of the bay, 4 miles from the entrance. **Avery Rock Light (44°39.3′ N., 67°20.7′ W.),** 52 feet above the water and visible 13 miles, is shown from a white steel skeleton tower on the rock. It is the guide for vessels bound up the bay. A bell buoy is close southwestward of the rock. The best anchorages are in Starboard Cove and in the head of the bay above Avery Rock Light.

Ram Island and **Foster Island,** about 1.5 miles west of the Libby Islands, are grass-covered and surrounded by ledges.

Foster Channel, between Foster and Ram Islands, is a narrow passage between Englishman Bay and the western side of the entrance to Machias Bay. The buoyed channel has a depth of about 18 feet.

Starboard Island Ledge, 0.5 mile east of Foster Island, has a least found depth of 7 feet and is marked by a buoy.

Stone Island, 1.1 mile northwest of Libby Islands, is wooded and has a bare rocky face at the south end. **Stone Island Ledge,** 0.2 mile east of the island, is bare at low water and is marked by a daybeacon.

Starboard Island, 0.7 mile west of Stone Island, is grassy at the southwest end and sparsely wooded at the northeast end, and has a conspicuous house in the western slope.

Starboard Cove, on the western side of Machias Bay 2.5 miles northward of Libby Island Light, is formed on the south by Starboard Island and **Starboard Island Bar,** bare at half tide, connecting the island with the shore. Excellent anchorage, except in easterly weather, is available in the cove in depths of 15 to 24 feet. The cove is much frequented by coasting vessels bound through Moosabec Reach making anchorage for the night. A good berth is in the middle of the cove, with the north end of Starboard Island in line with the south end of Stone Island, in depths of 18 to 21 feet. Small vessels can anchor closer to the bar, provided they take care not to shut out the north end of Stone Island by the north end of Starboard Island. The cove is entered eastward of Starboard Island, passing on either side of Stone Island.

Starboard, a small settlement on the western side of Starboard Cove, has no wharves.

Howard Cove, northward of Starboard Cove, is not a good anchorage; the holding ground is poor and the cove is exposed to southeast winds. There are no wharves. Broken ground, including a rock bare at low water, extends 0.3 mile southward and 0.7 mile eastward from

Howard Point, the eastern entrance point of the cove. The eastern extremity of this broken ground is **Seashore Ledge,** with a depth of 4 feet, marked by a buoy.

Bucks Harbor is a shallow cove in the west shore of Machias Bay 4 miles northward of Libby Island Light. **Bar Island** is on the northern side of the entrance to the harbor and **Bucks Head** is on the southern side. **Bucks Harbor** (P.O.) is a small fishing village on the slope westward of the harbor. Small vessels can anchor 200 yards off the southern side of Bar Island in depths of 8 to 15 feet. A footbridge connects **Bucks Neck (Smalls Point),** on the east side of the harbor, with the settlement of Bucks Harbor. On the southwest side of Bucks Harbor, opposite Bar Island, is a small T-head wharf with 4 to 6 feet at its float landing. Gasoline can be obtained at the wharf, and provisions and some supplies are available in the village. West of Bar Island, and just south of **Mountain Head,** 0.3 mile northwestward of the island, is a wreck which bares at low water. Local fishermen report a sunken rock about 100 yards north of Bucks Head. Vessels should keep a midchannel course in entering.

Colbeth Rock, 0.7 mile east-southeastward of the northern tip of Bucks Head, has a depth of 28 feet, breaks in heavy weather, and is unmarked.

All of the islands in Machias Bay above the entrance are high and wooded, with rocky shores. **Yellow Head (Yellow Island),** 0.5 mile east of Bar Island, is high, yellow in color, and a good landmark. **Chance Island,** 0.8 mile eastward of Yellow Head, is wooded on its northern part. **Bare Island** is 0.2 mile northward of Yellow Head and Bar Island. **Salt Island** is 0.8 mile north of Bare Island. **Round Island,** 100 feet high, is 300 yards northeastward of Salt Island. **Hog Island** is 0.8 mile northeast of Round Island.

Larrabee Cove, largely dry at low water, and **Indian Cove,** are small indentations in the west shore of Machias Bay northwest of Avery Rock Light. These coves are of little importance. Good anchorage for vessels of 8 feet draft will be found on the flats between Salt Island and Bare Island, near the entrances to the coves. A fish house and small wharf, nearly bare at low water, are in Indian Cove. A rock, bare at low water, in the middle of the cove, is the principal danger. **Larrabee** is a village at the head of Larrabee Cove.

Holmes Bay, a large bight in the northeastern part of Machias Bay and northeast of Hog Island, is shallow and has extensive reefs. A clam-packing factory and wharf which dries at low water, are on the north shore of the bay. A white schoolhouse on the point close eastward of the factory and a white church with belfry, about 0.6 mile westward, are conspicuous. Most of the bay dries at low water and is used only by fishermen.

Machias River, which empties into the northwestern part of Machias Bay, has a narrow, winding channel leading through flats that are mostly bare at low water. The least depth in the channel to the town of Machiasport is about 17 feet. Above Machiasport, the channel has shoaled to less than 1 foot in the bend below Machias, but in 1959, it was reported that with local knowledge 2 to 3 feet could be carried to Machias.

The river is crossed about 2 miles below Machias by a highway bridge with a swing span having a clearance of 3 feet; operating regulations are given in § **203.2,** Chapter 2. The power plant dam crosses the river in Machias.

The mean range of the **tide** at Machiasport is about 13 feet. In severe winters, Machias River is closed to navigation by ice, and drift ice will sometimes fill the bay above Avery Rock. In ordinary winters the bay and river are open to Machiasport.

Machiasport (P.O.) is a town on the west bank of the Machias River, 2.5 miles above the entrance. Prominent landmarks include a church spire, the cupola of the town hall, northward and below the spire, the three tall metal stacks of two canneries and a white church with belfry on the slope of the east bank of the river opposite the town. Customs duties are attended to by an officer from Jonesport. See Appendix for **storm warning** displays. There is a harbormaster in the town.

There are wharves at the two canneries, which have 8 feet alongside. Gasoline, food, and some supplies are obtainable. The town wharf, below the lower cannery wharf, has 4 feet alongside. There is a boatyard with marine railways capable of hauling out craft up to 50 feet in length. Hull repairs, and open and covered storage are available. There is telephone communication, and a good road connects with Machias and the main coastal highway.

East Machias River, which empties into Machias River from northeastward 1 mile above Machiasport, is practically bare at low water at **East Machias** (P.O.), a village on the railroad 1.5 miles above the entrance. The channel is difficult, and is little used except by small craft. In July 1958, the entrance to the river was almost hidden by fishweirs. There is a U.S. Public Health Service outpatient office at East Machias.

Machias (P.O.) is a town of marked historical interest at the head of navigation on Michias River. There is no waterborne commerce. Most of the wharves are in ruins, dry at low water, and unsafe to lay at due to projecting underpinning. There is one wharf, with a reported depth of 12 feet alongside. The wharf has a small crane and a machine shop, and repairs to gas and diesel engines are made. In a slip alongside the wharf, craft up to 60 feet in length can be ground out for hull repairs; gasoline and diesel oil can be obtained from tank truck. Water is obtainable from the wharf just above it. There is railway freight service to the town, but no passenger service. Telephone and telegraph communications, and bus and taxi service are available. Provisions, hardware, and some supplies can be obtained.

Craft bound for Machias Bay and River from the eastward should not attempt passage through Cross Island Narrows without local knowledge. With the aid of the chart they should not have any trouble passing southward of Cross Island and when clear of Cross Island (Seal Cove) Ledge, marked by a buoy, then shape up the bay for Avery Rock Light. Pass either side of the

rock, preferably to the westward, passing eastward of Round Island then head up for the river entrance, which is marked by a buoy on its southwestern side. The chart is the guide.

Approaching from the southward and westward, vessels with the aid of the chart, may pass either side of Libby Islands and head up the bay for Avery Rock Light, keeping clear of Stone Island Ledge and unmarked Colbeth Rock. Pass westward of Avery Rock and proceed as in the preceding paragraph.

Anchorage may be had anywhere between Avery Rock and Round Island, or eastward or northeastward of the latter at a distance not greater than 0.5 mile, in depths of 30 to 45 feet.

The channel in Machias River is marked by buoys to about 0.8 mile below Machiasport and should be followed with the aid of the chart. The best time is at low water when the flats are visible and the channel more clearly defined. Small vessels often anchor in the channel off the wharves at Machiasport, or for a distance of about 0.5 miles southward of the wharves.

Above Machiasport, the channel leads between shoals bare at low water and is unmarked except by private stakes which are in position only a part of the time. Local knowledge is necessary to carry the best water, but strangers in small craft should have no trouble in going to Machias on a rising tide with the aid of the chart.

Englishman and Chandler Bays form a large bight in the coast between Libby Islands and Head Harbor Island. **Roque Island,** 6 miles west of Libby Islands, and numerous smaller islands are in the middle of the bight. The bays join northward of Roque Island and form a good anchorage, with depths of 18 to 32 feet, good holding ground.

Englishman Bay, northward of Roque Island, has numerous dangers, most of them unmarked, in the approach to the anchorage northward of Roque Island, but the buoyed channel is broad and is easily followed in daytime and in clear weather with the aid of the chart. The principal entrance to the bay from eastward is between Scabby Islands on the east and The Brothers on the west, and affords a straight channel to Shoppee Island, above which is the anchorage.

The bay may be entered from Machias Bay through Foster Channel. Vessels from westward, bound to the anchorage at the head of Englishman Bay or to Chandler River, usually pass through Chandler Bay. Foster Channel and the adjacent islands have been discussed previously.

Scabby Islands, on the eastern side of the main entrance to Englishman Bay, are grass-covered. A mound on the larger Scabby Island is the most prominent mark in approaching Foster Channel from westward. A sunken rock is 400 yards north of Scabby Islands. **Scabby Island Ledge,** awash at low water, is 250 yards southwestward of the islands.

Codhead Ledge, 1.5 miles northwestward of Scabby Islands, is awash at low water and marked by a buoy on its western side.

Shag Ledge, 0.9 mile eastward of Codhead Ledge, has a low grass-covered islet on its western end. The northeast end of the ledge is covered only at high water, and the south end shelves off to 13 feet. A shoal with a depth of 5 feet is midway between Codhead and Shag Ledges.

Pierson Ledge, 0.4 northward of Shag Ledge and 350 yards west of **Point of Main,** is bare at low water.

Hickey Island, 0.7 mile northwestward of Shag Ledge and in the entrance to Little Kennebec Bay, is wooded on its northern end. A rock awash at low water is 250 yards eastward of the island and another rock is 200 yards southward of the island.

Little Kennebec Bay, which extends northward from the eastern part of Englishman Bay, is of little commercial importance and is frequented mostly by fishermen. Good, well-sheltered anchorage can be found in depths of 12 to 40 feet, soft bottom, inside of **Sea Wall Point,** 1 mile north of Hickey Island. However, this anchorage is seldom used, as nearby Machias Bay and Starboard Cove are much easier of access and are better anchorages. There are fishweirs in the upper part of the bay.

The Brothers, grassy islands with rocky shores, are on the southwestern side of the main entrance to Englishman Bay. A bell buoy is off the northeast end of The Brothers.

Green Island, 0.3 mile north of The Brothers, is grassy. **Green Island Ledge,** partly bare at low water, extends 0.3 mile eastward from the island and is marked by a buoy on its eastern side. A ledge, awash at high water, extends 200 yards westward from Green Island. **Brothers Passage** is between Green Island and The Brothers.

Pulpit Rock, 1 mile westward of The Brothers, is a bare, rocky islet. The southern and eastern sides should be given a berth of at least 300 yards, as a rock with 7 feet over it, has been reported about 150 yards southeastward of it.

Jumper Ledge, about 0.6 mile southward of Pulpit Rock, has a least depth of 5 feet, and is marked by a buoy. An unmarked 28-foot spot is about 0.75 mile east-southeastward of the ledge; and **Misery Ledge,** with a depth of 14 feet about 0.6 mile south-southeastward, is also unmarked.

Halifax Island, 0.8 mile northwestward of Green Island, is grass-covered, with rocky sides, and has a prominent mound at its western end. **Anguilla, Double Shot, Great Spruce,** and **Little Spruce Islands,** westward of Halifax Island, are wooded. A rock, bare at low water, is 300 yards southeastward of Halifax Island. It is reported that a rock, with a depth or 5 feet over it, is about 500 yards northwestward from the northernmost tip of the island. A bar with depths of 19 to 26 feet extends from Halifax Island to Green Island. The current is reported to boil over the bar, and this passage should be used with caution.

A rock, well covered at high water, is 300 yards south-

ward of Double Shot Island. **Shag Rock,** 500 yards eastward of Double Shot Island, is high and bare.

Roque Island Harbor is formed on the north and west by Roque Island, and on the south by Great Spruce Island and the islands extending eastward to Halifax Island. The harbor affords shelter from all winds and is used by small vessels, but the holding ground is not good except in spots. The best anchorage is in the western or northwestern parts of the harbor where the bottom is soft.

The entrances to the harbor are mostly foul. The best entrance is from eastward, passing north of Halifax Island. There are least found depths of 10 feet, rocky bottom, on the shoal 0.5 mile and 1 mile northwestward from Halifax Island. These, and the rock reported with a depth of 5 feet previously mentioned, are all in the approach to the harbor. Kelp is reported to be visible at low water on these shoals.

Lakeman, Bar, and **Marsh Islands,** are off the northeast side of Roque Island, and on the northern side of the entrance to the harbor.

To enter Roque Island Harbor, follow the chart carefully, keeping clear of unmarked dangers in the entrance.

The principal dangers in Roque Island Harbor include a spot with 8 feet on it 0.2 mile off the middle of the north side of Great Spruce Island, and **Seal Ledge,** bare 5 feet at low water, located 300 yards westward of the southern point at the eastern end of Roque Island.

Lakeman Harbor, on the northeast side of Roque Island Harbor, is a good anchorage for small craft.

The **Thorofare,** connecting the southwest side of Roque Island Harbor with Chandler Bay, has a depth of 9 feet in a narrow, crooked channel. The bottom is visible in the shoaler parts of the channel. The Thorofare is used considerably by small vessels with local knowledge. Strangers should avoid it.

Bunker Cove, situated between Great Spruce and Little Spruce Islands and the Thorofare, is a good harbor and is used for winter storage of small craft. Small craft often anchor in its entrance just off the Thorofare.

Shoppee Island, 2 miles northwest of Halifax Island, is flat and wooded except at the northwest end. A reef, known as **Boundary Ledges,** on the outer edge of which are rocks bare at low water only, extends northeastward from Roque Island to within 0.4 mile of Shoppee Island. A buoy marks the northeastern end of the reef.

Shoppee Point is on the mainland, 0.3 mile north of Shoppee Island. A modern private wharf, with a depth of 9 feet alongside a 45-foot face at the outer end, is on the point, about 0.5 mile northwestward of Shoppee Point. The wharf is about 200 feet long.

Roque Bluffs is a village 0.6 mile eastward of Shoppee Point. The mouth of **Englishman River,** southeast of Roque Bluffs, is crossed by a fixed highway bridge with a clearance of 3 feet. The yellow bluffs at the mouth of the river are prominent from the southward.

Shorey Cove, a bight in the north shore of Roque Island, has depths of 8 to 13 feet. The cove is a good anchorage for small vessels, but is little used. There are no dangers if the southern and western shores of the cove are given a birth of over 300 yards. There is a private landing on the east side of **Squire Point,** the northwest extremity of Roque Island.

Great Cove, on the northeast side of Englishman Bay above Shoppee Point, has its entrance between **Pond Cove Island,** 1.2 miles northwestward of Shoppee Island, and **Little Ram Island,** 1 mile north of Roque Island. The entrance is clear of dangers with the exception of a rock, bare at low water, 300 yards northeastward of Little Ram Island. Excellent anchorage may be had in depths of 10 to 17 feet, soft bottom, westward or northwestward of Pond Cove Island at a distance of not more than 0.6 mile. The part of the cove northward of Pond Cove Island is shoal. There are numerous fishweirs in the cove.

Chandler River, at the head of Englishman Bay, is very narrow and crooked to the head of navigation at **Jonesboro** (P.O.), a village about 3.5 miles above the mouth. The river is bare at low water at Jonesboro. The channel is unmarked, and strangers should not attempt to enter without a pilot. Pilots may be had from among the local fishermen at the mouth of the river. Drafts of 14 feet have been taken to **Kilton Point,** about 1.5 miles above the mouth. The only traffic to Jonesboro consists of small boats engaged in fishing and clamming. On the northeast side of the river, 0.5 mile above Kilton Point, is a clam factory. Small boats sometimes venture up the river to the highway bridge, above which is a dam.

Ice closes Chandler River to Kilton Point from about December to April. It is reported that the river seldom freezes below **Deep Hole Point,** 0.3 mile southeastward of Kilton Point, but in extreme winters the bay is said to have been frozen as far as Roque Island.

Mason Bay, extending westward from the head of Englishman Bay, is practically bare at low water and has many rocks inside the entrance. An unmarked channel with a depth of 13 feet leads to the entrance from southward. The small settlement of **Mason Bay** is on the south side of the bay just inside the entrance. Fish-traps are numerous in the vicinity.

Chandler Bay, on the west side of Roque Island, extends northward from Mark Island to Squire Point where it joins Englishman Bay. A good channel leads eastward of Ballast Island and around Squire Point into Englishman Bay and Chandler River. The principal dangers are buoyed, and the channel can be followed readily during daytime in clear weather with the aid of the chart. The bay is the approach from the westward to Chandler River and the anchorage in Englishman Bay, and is the one generally used by strangers. There are no good anchorages in the bay until north of Roque Island. Care should be taken to avoid the unmarked 17-foot spot in the southern entrance 0.7 mile westward of Little Spruce Island.

There are numerous dangers off Chandler Bay. **Big Breaking (Black) Ledge,** a pinnacle bare at low water, is on the western side of the approach from sea, 0.2 mile eastward of Head Harbor Island. **Little Breaking Ledge,** with a depth of 9 feet over it, and marked by a lighted gong buoy, 200 yards east-northeast of it, is about 0.4 mile northeastward of Big Breaking Ledge. **Eastern Ledges,** about 600 yards long, are 1.4 miles south of

Great Spruce Island. At the easterly end of Eastern Ledges is a rock bare at low water, and at the westerly end are two sunken rocks nearly awash at low water. A rock, covered near high water, and nearly always marked by a breaker, is 0.7 mile northeastward of Eastern Ledges. **Fifth Rock,** with a depth of 7 feet over it, is 400 yards southwest of Eastern Ledges. A buoy is south of the rock.

In Chandler Bay, **Great Spruce Ledges** are close to the south side of Great Spruce Island; the southernmost rock is covered at high water. **Wallace (Little Spruce) Ledge,** 350 yards off the southwestern side of Little Spruce Island, is awash at low water. **Ballast Island,** on the western side of the main channel through Chandler Bay and 0.9 mile west of Roque Island, is grassy; a buoy marks the eastern end of **Ballast Island Ledge** which extends 200 yards eastward of the island. **Roque Island Ledge,** marked by a buoy at its western end, extends 700 yards off the west side of Squire Point. Just above Squire Point, **Great Bar** extends from the western shore of Chandler Bay for 0.5 mile. The buoy off the end of the bar marks the western side of the channel.

Vessels bound into the anchorage northward of Roque Island, either through Englishman Bay or Chandler Bay, should have no difficulty in doing so with the aid of the chart. Due regard should be given to the many unmarked dangers and the necessity for caution if the waters are unfamiliar.

Moosabec Reach is the narrow passage west of Chandler Bay leading between the mainland on the north and the group of islands on the south between Chandler Bay and Pleasant Bay. The passage is an important thoroughfare and is much used by vessels of 10 feet or less draft in the daytime; a draft of 21 feet can be taken through at high water. **Mark Island,** heavily wooded, is the prominent guide to the eastern entrance, and Nash Island Light to the western entrance.

In the eastern entrance to Moosabec Reach a Federal project provides for a channel 14 feet deep. In July 1958, it was reported that the western end of the dredged channel had shoaled to 10 feet northwestward of the daybeacon on Snows Rock. In the western part of the reach, there is a depth of 13 feet between Hardwood Island, 3.2 miles westward of Kelley Point, and Fessenden Ledge. **Kelley Point** is the northeastern entrance point on the mainland, 1.2 miles west of Mark Island.

The channel is well marked by a light, daybeacons, and buoys. Vessels can readily follow the channel in daytime with the aid of the chart in clear weather, but strangers should not attempt passage at night. **Emms Rock Light (44°31.7′ N., 67°34.0′ W.),** 28 feet above water and visible 6 miles, is shown from a black skeleton tower on the south side of the channel about 400 yards south of Kelley Point. The stone jetty extending southeastward from the light to **Nova Rocks** bares about 3 feet at low water. A daybeacon is on **Gilchrist Rock,** 0.5 mile west of Mark Island; and another daybeacon is on **Snows Rock,** about 0.5 mile southwest of Kelley Point; the 10-foot spot is in the channel northwestward of Snows Rock.

A fixed highway bridge with clearance of 39 feet joining Jonesport with Beals crosses Moosabec Reach, about 2 miles west of Kelley Point. Lights in the center of the span and on each side of the fender piling, mark the navigation channel through the bridge.

Vessels caught by fog in the reach, anchor anywhere in the channel where there is swinging room and the bottom is soft.

Pilots can usually be obtained from among the local fishermen.

The mean range of the **tide** is about 11.5 feet. The tidal currents have considerable velocity in the dredged channel, particularly at the light on the stone jetty. The **current** floods to the eastward and ebbs to the westward. In 1958 it was observed that back eddies formed with the beginning of the tidal flow on each side of the bridge. This condition is caused by the solid fill causeway approaches to the bridge. The channel is reported to have been ice-free in recent years.

Jonesport (P.O.) is a fishing town on the north shore of Moosabec Reach. There is considerable trade in fish and lobsters, and the canning of sardines, clams, and blueberries. Boat building is of importance, especially in recent years of sport fishing boats.

The bridge over the reach is a prominent object. A green painted church with belfry, in **West Jonesport** (P.O.); the twin elevated tanks of the large fish cannery, close westward of the bridge; a large red brick two-story schoolhouse and the spire of a church near **Sawyer Cove,** all on the north side of the reach, are conspicuous. On the south side of the reach, the belfries of two white churches in Beals are prominent.

Jonesport is a **customs port of entry** at which marine documents are issued. The wharf at the large fish cannery is reported to have 10 feet alongside, while the one east of the bridge has 6 feet. There are two boatyards at Jonesport, one of which has built craft up to 80 feet in length. Both yards have marine railways for hauling out boats up to 40 feet in length for hull repairs. A ship's carpenter is available, and a machine shop can handle repairs to gas and diesel engines. Gasoline, diesel oil, water, food, and some ship chandlery can be obtained. The town has telephone and highway communication.

Beals (P.O.) is a village on the northern end of **Beals Island,** which is on the south side of Moosabec Reach opposite Jonesport. The main wharf at the northeastern extremity of the island has a depth of 8 feet alongside. It is also the Coast Guard wharf. Diesel oil, gasoline, water, provisions, and ship chandlery are available at the wharf.

The fish wharves in **Beals Harbor** on the northwest side of Beals are bare at low water. A Federal project provides for an anchorage 10 feet deep over an area about 600 feet long and varying in width from 1,000 feet at the 10-foot depth curve in Moosabec Reach to about 600 feet at the inner end of the harbor. In 1957 the

project depth was obtained in the easterly half of the area, and 7 feet in the westerly half over a small ledge area.

There are three boatyards on Beals Island where fishing craft up to 65 feet in length are built.

Indian River and **West River,** extending northward at the western end of Moosabec Reach, have crooked unmarked channels fringed by rocks. The rivers are frequented only by local fishermen. There are no landings except for small craft at high water.

Wohoa Bay, 3 miles west of Jonesport, is the large bay east of **Moose Neck** and south of Bickford Point. Good anchorage is reported between **Carrying Place Island,** 300 yards northeast of Moose Neck, and Fessenden Ledge, in depths of 16 to 37 feet.

Several islands are adjacent to the usual route westward from Moosabec Reach through Tibbett Narrows. **Pomp Island,** 1.2 miles west of Beals Island, is wooded. **Hardwood Island,** 0.7 mile west of Pomp Island, also is wooded and has a house on the north end and a prominent quarry on the south end. A 13-foot shoal is in mid-channel between this island and **Fessenden Ledge,** 0.4 mile northwestward. **Shabbit Island Ledge,** 0.5 mile west of Hardwood Island, has a small spot bare at high water. **Shabbit Island,** 1.1 miles southwestward of Hardwood Island, is low and wooded in the center. **Tibbett (Sheep) Island,** 2.4 miles southwestward of Hardwood Island on the northwestern side of **Tibbett Narrows,** is wooded. **Ram Island,** on the southeastern side of the narrows also is wooded. Fessenden Ledge and Shabbit Island Ledge are marked by buoys and a buoy is 200 yards northwestward of Shabbit Island.

Head Harbor is between **Head Harbor Island,** the easternmost island of the group, and **Steele Harbor Island.** The harbor affords sheltered anchorage in depths of 15 to 21 feet. It is small, and has unmarked rocks bare at low water on both sides of the entrance and anchorage. Strangers should not enter without a pilot. The rocks of **Man Island** and **Black Head,** the eastern side of the entrance, are dark, while those on the western side are light in color.

Mistake Harbor, westward of Steele Harbor Island, is small but affords secure anchorage in depths of 24 to 42 feet. The entrance from southward is through **Main Channel Way,** a deep but narrow channel leading between Steele Harbor Island on the east and **Mistake** and **Knight Islands** on the west. With care, the harbor may also be entered through Mud Hole Channel.

Moose Peak Light (44°28.5′ N., 67°32.0′ W.), 72 feet above the water and visible 14 miles, is shown from a white tower on the southeastern extremity of Mistake Island; a fog signal is near the light. There is a Coast Guard Station at the light. See Appendix for **storm warning** displays.

To enter Mistake Harbor through Main Channel Way, give the south end of Steele Harbor Island a berth of about 0.3 mile when southeastward of it and enter in midchannel. When through the narrowest part of the channel, select anchorage in depths of 20 to 42 feet between the northwest end of Knight Island and the buoy 0.5 mile northwestward of it. This buoy, in the middle of Mistake Harbor, marks a rock bare only at low water.

Green Island is the largest of the islands and rocks extending northwestward along the south side of Mistake Harbor. Rocks bare at low water are 300 yards northward and over 400 yards northwestward of the island. Two sunken rocks with a depth of 4 feet are 600 yards northwestward of the island.

Eastern Bay is northward of Mistake Harbor between Head Harbor and Great Wass Islands; a thorough local knowledge is required to navigate the bay.

Mud Hole Channel, 0.5 mile westward of Moose Peak Light, leads northwestward to the **Mud Hole,** which is a narrow cove in Great Wass Island, and to the western end of Mistake Harbor. Mud Hole is entered at high water; boats are sometimes stored in the cove. Good anchorage is available for small vessels at the entrance to Sand Cove and Mud Hole, in depths of 14 to 30 feet, soft bottom.

Black Ledges, on the southwest side of Mud Hole Channel, and extending nearly 1 mile in a southeasterly direction from **Little Cape Point** on Great Wass Island, consist of a group of rocks and ledges, many of which are bare at half tide. **Channel Rock,** the southeasternmost of the Black Ledges, is awash at high water. **Freeman Rock,** 600 yards southwestward of Channel Rock, is a bare rock about 40 feet high.

The principal dangers on the northeast side of Mud Hole Channel are a rock, bare at low water, 150 yards off the southwest side of the island on the northeast side of the entrance, and a sunken rock 350 yards westward of Green Island.

Local knowledge is advisable for passage through Mud Hole Channel from Mistake Harbor to the sea, as the dangers are numerous and unmarked, though it can be made in daytime only with the aid of the chart.

Great Wass Island, 1.5 miles westward of Steele Harbor Island and southward of Jonesport, has a number of coves that are frequented by small craft. **Black Duck Cove** on the west side of the island and **Sand Cove** on the east side are used by fishermen; Mud Hole on the east side is used by fishermen for winter haulout storage. There are a number of boatyards on the island, which in 1959 were reported to be inactive. **Red Head (Cummings Head),** on the southern side of the island, appears reddish from offshore. The cupola of the former Three Falls Lifeboat station on the west side of the island, about midway between **Three Falls Point** and **Norton Point,** is conspicuous from seaward.

Western Bay, westward of Great Wass Island, has numerous groups of islands which lie mostly in a north and south direction. Between the groups are passages leading to the western end of Moosabec Reach that are used by vessels with local knowledge.

Crumple Island, 0.6 mile west of the south end of Great Wass Island, is a high, bare, rocky island with several nubbles. **Fisherman Island,** 0.2 mile northwestward of Crumple Island, and **Browney Island,** 1.2 miles northwestward of Crumple Island, have rocks and ledges between them. The passage between Great Wass Island

and Crumple, Fisherman, and Browney Islands has numerous unmarked sunken rocks. A line of ledges and rocks extends from Browney Island to Great Wass Island. There is a narrow channel with a depth of about 10 feet through these ledges. Strangers should not attempt this passage.

Egg Rock, a bare, rocky islet, is 1.3 miles west-southwestward of Crumple Island. Between the two are numerous rocks and ledges, including **Curlew, Green,** and **Seal Rocks. Drown Boys Ledges,** awash at low water, are about 0.7 mile northward of **Egg** Rock. **Seahorse Rock,** bare at half tide, is 0.4 mile southwestward of Egg Rock and is marked by a bell buoy southwestward of it.

Outer Sand Island, 2.4 miles northwest of Egg Rock, and **Inner Sand Island,** 0.6 mile north of Outer Sand Island, are wooded.

Drisko, Little Drisko, and **Stevens Islands,** northward of Sand Islands, are wooded. **Flat Island,** 1.4 miles west of Outer Sand Island, and **Green Island,** 1.6 miles north of Flat Island, are comparatively low and covered with grass. **Plummer Island,** 0.4 mile east of Green Island, is wooded. The highest parts of **Stanley Ledge,** 0.3 mile southward of Outer Sand Island, and **Batson Ledges,** 0.4 mile eastward of Inner Sand Island, show above high water. **Black Rock** is a low, bare rock, 1.3 miles southward of Flat Island, and 2.2 miles southeastward of Nash Island Light. An unmarked 30-foot shoal is 2.7 miles southward of Black Rock.

The passage between Seahorse Rock, Drown Boys Ledges, and Ram Island on the east, and the Sand and Drisko Islands on the west, has a broad channel in its southern part, although there are unmarked dangers on either side. The northern end of the passage on either side of Hardwood Island is foul, and the passage should not be used by strangers.

The passage westward of the Sand and Drisko Islands and Shabbit Island and eastward of Black Rock, Flat Island, and Plummer Island is comparatively clear. Another comparatively clear passage is westward of Black Rock, Flat Island, and Green Island and eastward of Big Nash Island. Both passages can be used in the daytime in clear weather with the assistance of the chart.

Chart 305.—Eastern Harbor (Cape Split Harbor), on the west side of **Moose Neck** and 2 miles northeastward of Nash Island Light, is a secure anchorage for small vessels. The buoyed entrance is easily navigated in daytime. The harbor has extensive flats and ledges, between which is a channel 200 yards or more wide.

The anchorage with the best swinging room is in depths of 18 to 22 feet in mid-channel, about 0.4 mile inside Eastern Pitch, the point on the west side of the entrance. Craft of less than 9-foot draft can anchor in depths of 9 to 15 feet in **Otter Cove,** which makes into Moose Neck, 0.6 mile northeastward of Eastern Pitch. Another good spot is northwestward of the wharf in depths of 12 feet.

There are several rocky ledges that dry to stay clear of in the northeastern part of the harbor. The flats are soft mud in places and small craft sometimes are beached on them. A reef which shows well at low water extends 400 yards southward and southwestward from the point on the east side of the entrance. It is marked on its west side by a buoy.

A cannery and a wharf with a depth of 5 feet alongside and the village of **South Addison** are on the eastern side of the harbor. Food and some ship chandlery are available, and engine repairs can be made. Gasoline and diesel oil are piped to the wharf.

The aproach to Eastern Harbor, between Tibbet Island and Ladie Ledges, is clear if these islands are given a berth of over 300 yards. From westward the approach is clear between the daybeacon southwest of Norton Island and Pot Rock. Enter the harbor midway between the buoys at the entrance, staying mid-channel and keeping a sharp lookout for an old fishweir on the eastern side of the entrance.

Pleasant, Narraguagus, and Pigeon Hill Bays, which indent the coast between Nash Island on the east and Petit Manan Island on the west, are the approaches to the villages of Addison, Harrington, Milbridge, and Cherryfield, all on tributaries of the bays. These waters are frequented mostly by local fishing boats. The bays are separated by islands and rocks, through which are several thoroughfares.

Good anchorage can be found in Pleasant and Narraguagus Bays, the latter being used much as a harbor of refuge.

The mean range of the tide is about 12 feet at Addison, 11 feet at Trafton Island, and 11.3 feet at Milbridge.

From December to April ice usually forms on Pleasant River and Harrington River to their mouths, and very frequently on Harrington Bay. Ice seldom obstructs navigation in Narraguagus River except in January and February, during which time the river usually is frozen to the mouth. In ordinary winters, the ice that forms in these bays goes out with the tides.

Pleasant Bay, 6.5 miles west of Jonesport, is a secure anchorage and is easily entered in the daytime. **Nash** and **Big Nash (Cone) Islands,** on the eastern side of the entrance to Pleasant Bay, are grassy. **Nash Island Light (44°27.9′ N., 67°44.9′ W.),** 51 feet above the water and visible 12 miles, is shown from a white square tower on the west side of Nash Island. A lighted whistle buoy is about 0.5 mile west of the light. A ledge, the southern end of which bares, extends about 500 yards southward from Nash Island.

There are numerous islands and ledges in Pleasant Bay, but the important dangers are marked by buoys. A channel with a least width of 0.5 mile, and with depths of 36 feet or more, leads up the bay to the anchorages.

Anchorage is available in depths of 30 to 38 feet westward of **Nightcap Island,** a grassy island with a few bushes on its north side 3.4 miles north of Nash Island, and southward of **Barton Ledge,** a buoyed danger bare at low water 0.4 mile northwest of Nightcap Island. A better anchorage, and the one used most frequently, is in

depths of 14 to 18 feet southeastward and eastward of **Birch Islands,** wooded islands 0.7 mile north of Nightcap Island.

No difficulty should be experienced approaching Pleasant Bay anchorage during daytime in clear weather with the aid of the chart. At other times it would not be prudent for strangers to pass northward of the vicinity of Nash Island Light, as there are no lighted aids in the bay. If need for shelter demands it, craft can proceed on a **344°** course for 2.2 miles from the lighted whistle buoy 0.5 miles westward of Nash Island Light, to a temporary anchorage in 10 fathoms in the middle of Pleasant Bay.

Ladle Ledges are about 0.9 mile north of Big Nash Island, and 0.7 mile southwestward of the entrance to Eastern Harbor. A bare symmetrical mound at the northern end is conspicuous. **Pot Rock** is a bare rock about 0.6 mile southwestward of Ladle Ledges.

Flint Island, on the west side of the entrance to Pleasant Bay and 1.8 miles northwest of Nash Island, is wooded. The southeastern side of Flint Island should be given a berth of at least 0.5 mile. **Coles Ledge,** 0.3 mile eastward of the island, is bare near low water and marked on its eastern side by a buoy.

Flint Island Narrows is a deep passage leading from Pleasant Bay to Narragaugus Bay between Flint Island and **Dyer Island,** 0.4 mile northward. The passage is used principally by fishing boats. The channel has a width of only about 200 yards at its narrowest part, but in clear weather with the aid of the chart little difficulty should be experienced in its passage, having due regard for the ledges that make out from the south shore of Dyer Island. A buoy, on the northern edge of the ledges making out from the northeastern side of Flint Island, marks the eastern entrance to the narrows.

Norton Island, on the east side of Pleasant Bay and 2 miles north of Nash Island, is grassy. **Norton Island Ledge,** 400 yards westward of Norton Island, is bare in spots and at high water is unmarked. The reef extending 400 yards southward from the island is partly bare at high water and is marked by a daybeacon at its outer end.

The channel between Norton Island and Cape Split, 0.4 mile eastward, is obstructed inside the entrance by a small, rocky, unmarked shoal, with a least depth of 9 feet. Northward of Norton Island the channel is restricted by rocks and ledges.

Bay (Narrows Island) Ledge, 0.4 mile south of the islands in the northwestern part of Pleasant Bay, is bare at half tide.

Nightcap Ledge, extending southward from Nightcap Island, is bare at the inner end at half tide.

Bunker Ledge, 0.3 mile westward of the southern Birch Island, is bare at half tide and is marked on its eastern side by a buoy.

Raspberry and **Mink Islands,** northward of Birch Islands, are grassy. **Fort Island** is 0.5 mile north of Raspberry Island.

Pleasant River empties into Pleasant Bay from the northward. The channel is buoyed from just below **Look Point** to within 0.7 mile of Addison. The river is seldom used except by fishermen, and the once extensive trade in lumber has ceased for many years. Passage up the river is suitable for small craft only, except with local knowledge, as the river is reported to have shoaled in many places. Above Addison, the river is still navigable to Columbia Falls, but is seldom used except by small craft which can clear the fixed bridge just above Addison. Ice obstructs the river from December to April.

The **West Branch** of the river at Addison is closed by highway fill and a bridge-dam, which is fitted with clapper valves which prevents the flood tide entering the branch, but allows the branch to drain on the ebb and during freshets.

Addison (P.O.), is a village about 5 miles above the mouth of Pleasant River. There is no waterborne traffic except some fishing vessels. The wharves are in ruins. Gasoline and some supplies can be obtained from a general store with a service station. On the west side of the river at the bend at Addison there is an inactive fish cannery which has a wharf which dries at low water. A highway bridge with a clearance of 4½ feet crosses the river just above Addison. It was formerly a swing bridge but has been inoperable for a number of years.

Columbia Falls (P.O.), is a village 5 miles above Addison. It has a water-powered sawmill and a wharf. The wharf is in disrepair. The falls and dam at the mill are at the head of navigation on the river. There is a railway freight terminal, and telephone and bus communication.

Harrington Bay is separated from the upper part of Pleasant Bay on the east by **Ripley Neck** and from Narraguagus Bay on the west by **Foster Island.** The bay extends about 2.5 miles in a northerly direction. Good anchorage may be found in Harrington Bay in depths of 30 to 47 feet; the channel has a depth of 27 feet. The bay and anchorage are seldom used except by local vessels.

Strout Island, in the middle of the entrance to Harrington Bay from Pleasant Bay, is sparsely wooded. **Strout Island Ledges,** southeastward of Strout Island, are covered at high water; the south end of the ledges is bare at low water and marked by a buoy. A rock awash at low water and marked by a buoy is 0.5 mile southeastward of Strout Island. **Shag Islet,** 0.3 mile northward of the island, is a low, bare rock. The channel between Strout Island and **Otter Island,** 0.2 mile southward, is called **Strout Island Narrows.**

Small craft approaching and entering Harrington Bay should have no trouble with the aid of the chart; but larger vessels, and strangers to the area, should not attempt it without local knowledge.

Dyer Island Narrows, the passage between Dyer Island and Foster Island that connects Harrington Bay and Narraguagus Bay, has a depth of 9 feet. This passage is buoyed. There are numerous dangers close to the channel, and the buoys must be followed closely. Local pilots report dangers in this channel and that a boat

drawing 3 feet has struck boulders. Strangers should not attempt passage through Dyer Island Narrows without local knowledge.

Chamberly Island, 2.5 miles north of Strout Island, is at the head of Harrington Bay.

Flat Bay and **Mill River,** extending northwestward from the head of Harrington Bay, are mostly bare at low water and are seldom used except by boats engaged in clamming.

Harrington River, which empties into the head of Harrington Bay from northward, has a narrow, crooked, unmarked channel. The river shoals to a depth of 1 foot near the town of **Harrington** (P.O.), at the head of navigation, about 4 miles above the mouth. An overhead power cable, with a permit clearance of 48 feet, crosses the river on poles, about 0.3 mile below the town. A telephone cable crosses on the same poles about 20 feet below the power cable.

The channel above **Nash Point,** 2.4 miles north of Chamberly Island, is narrow and tortuous. Motorboats and small fishing boats run up to the town at high water, but there is no arrangement for supplying them with gasoline and water. There is a dock on the north bank of the river, just below the bridge, which is reported to have 2 feet alongside. The town has railway freight connections, and telephone and bus communication. Ice forms in the river and bay between December and April as far down as Ripley Neck.

Narraguagus Bay is northward of Petit Manan Island and northwestward of Nash Island. The principal dangers in the channel are buoyed. The lights on Nash Island and Petit Manan Island and the lighted bell buoy just eastward of Pond Island are guides for the entrance. The bay is connected with Pleasant Bay by Flint Island Narrows, and with Harrington Bay by Dyer Island Narrows, both of which have been described previously.

The lower part of Narraguagus Bay is a well-sheltered anchorage, much used as a harbor of refuge in all seasons by vessels up to 18-foot draft. The usual anchorage for vessels seeking shelter in the bay is between Trafton Island and Lower Middle Ground buoy in depths of 21 feet, soft bottom. Vessels of 10-foot draft or less sometimes anchor in depths of 14 to 17 feet north of Trafton Island, about midway between it and the daybeacon on Trafton Halftide Ledge. Vessels bound up to Milbridge anchor in depths of 14 to 16 feet about 0.5 mile east of Wyman, with the wharf bearing about 274°. Good anchorage in depths of 24 feet, soft bottom, will be found about 0.4 mile northeastward of the daybeacon on Trafton Halftide Ledge.

Vessels should experience no trouble in approaching the anchorages in Narraguagus Bay with the aid of the chart in daytime and in clear weather, but should not go above Pond Island at night, or above the anchorages in daytime without local knowledge.

Bois Bubert Island, 5 miles west-southwestward of Nash Island, is on the western side of the approach to Narraguagus Bay. **Jerry Ledge,** off the southeast end of Bois Bubert Island, is bare at low water. A 15-foot spot just south of this ledge is marked by a buoy on its southern side.

Jordans Delight Ledge, in the middle of the entrance to Narraguagus Bay and 1.6 miles east of Bois Bubert Island, has a rock at its southwest end that is bare at low water and marked by a daybeacon. **Black Ledge,** at the northeast end of Jordans Delight Ledge, is bare at half tide. The ground in this vicinity is very broken and should not be crossed.

Mackerel Rock, unmarked and with a depth of 10 feet, is 0.6 mile north-northeastward from Black Ledge. The rock is slightly west of the range made by Black Ledge and Petit Manan Light.

Jordans Delight, 3.5 miles west of Nash Island, is a rocky island, sparsely wooded on top. **Pond Island,** 3.7 miles west of Nash Island, shows from southward as a bare conical hill 158 feet high. Narraguagus abandoned lighthouse tower is on the eastern side of the island. This tower, white in color and connected with a dwelling, is 54 feet above water and is a conspicuous landmark easily seen to the eastward and southward, but cannot be seen to west and northward of it, being hidden by the trees and high land behind it. A cupola of a house near the north end of the island is conspicuous to the northward. A lighted bell buoy is 0.3 mile eastward of the tower.

Douglas Islands, between Pond Island and Bois Bubert Island, are wooded. **Douglas Island Harbor** is north of the Douglas Islands and west of Pond Island. The harbor has anchorage in depths of 24 to 36 feet, but is seldom used, since better anchorage is available above Trafton Island. Considerable sea makes into the harbor in heavy southerly weather. The harbor is clear except at its southwest end where **Douglas Island Ledge,** partly bare at low water, extends 350 yards northwestward from the middle Douglas Island. The dangers in the southern part of the harbor will be avoided by keeping the summit of Pond Island bearing southward of 094°.

Entering Douglas Island Harbor northward of Pond Island, pass northward and at least 0.3 mile westward of the buoy 0.3 mile north of the island. The harbor may also be entered from southward between the islands; the best channel is between the wooded island near the southwest end of Pond Island on the east, and the easternmost of the three Douglas Islands and the bare rock 250 yards southward from it on the west. Entering by this passage, avoid two rocks, bare at low water, which are 125 yards southwestward of the wooded islet 250 yards off the middle of the west side of Pond Island.

A narrow channel, said to have a depth of at least 8 feet, leads from Douglas Island Harbor into the head of Pigeon Hill Bay. This channel is bordered on both sides by rocks sunken and awash. The best water leads about 75 yards northward of **Currant Island,** which is wooded in the center and 0.3 mile north of Bois Bubert Island. While this channel is much used by local fishermen who follow the fishweirs as guides during the summer, it is not recommended for strangers.

Shipstern Island, 0.5 mile west of Flint Island and on the eastern side at the entrance of Narraguagus Bay,

is high, round, and wooded, and has rocky bluffs on its south side.

Tommy Island, 0.8 mile northwest of Shipstern Island, is low and sparsely wooded. **Western Reef (Yellow Ledge),** extending 0.4 mile southward from Tommy Island, has a bare rock on its southern end and is marked by a buoy.

Trafton Island, 0.5 mile west of Tommy Island, is wooded. There is a good channel on either side of Trafton Island. **Trafton Island Ledge,** in the middle of the entrance to the cove on the north side of Trafton Island, is a bare rock. **Trafton Halftide Ledge,** 0.6 mile northward of Trafton Island, is partly bare at low water and is marked by a daybeacon near its northern end.

Lower Middle Ground, an extensive shoal on the west side of the bay westward of Trafton Halftide Ledge, is marked on its eastern side by a buoy. A private pier with float landing is on the point on the south side of **Stover Cove,** and a conspicuous flagpole is on the reef extending from the point close southeastward from the cove. There is a lobster pound and wharf, dry at low water, on the south side of **Smith Cove.**

Wyman is a village on the western side of Narraguagus Bay, 1.8 miles northwestward of Trafton Island. There is a fish cannery with wharf, dry at low water, on Mitchell Point. The green roof and aluminum painted metal stack and tanks of the cannery are conspicuous. A 300-foot pier, with 2 feet of water at the head, extends in a northeasterly direction from the point. Gasoline is obtainable and the village has a general store. A good highway connects with Milbridge.

Narraguagus River, emptying into Narraguagus Bay from northward, has a least depth of about 4 feet to Milbridge. The channel is marked but is narrow and crooked, and leads between flats that bare at low water. Strangers should navigate the river on a rising tide. Old fishweirs, only part of which show at low water, are on either side of the channel just above the fairway buoy off the entrance. Care should be taken in entering to have this buoy close aboard before heading up for the channel entrance, as the weirs are reported to be not visible at high water.

Milbridge (P.O.), is a small town on the west side of Narraguagus River about 2 miles northwest of Wyman. In July 1958, there were two canneries in operation, both with wharves. The upper one has a 600-foot pier with 10 feet of water at the head. The lower one on the south side of Wallace Creek, in the lower part of the town, is dry at low water; the narrow and crooked channel to it is marked by perches. The wharf of an inactive cannery in the cove on the north side of the river east of the bridge is reported to have 8 feet alongside.

Care must be taken in entering to clear the ruins of the two old cannery wharves, of which only piles remain; the lower one extends out to the channel and most of the piling covers at high water. Part of the lower ruin is used by fishermen to tie up to and is locally known as the town wharf. It has 5 feet of water alongside. Diesel oil, gasoline, water, food, and some ship chandlery are available at Milbridge.

The highway crosses the river at Milbridge on a highway fill and two bridges. The swing bridge over the west channel has a clearance of 5 feet; operating **regulations** are given in § **203.2a,** Chapter 2. A fixed bridge over the east channel has a clearance of 5 feet. The west channel is used by craft when taking shelter in the anchorage above the bridge during heavy weather. There is reported to be a depth of 15 feet in the anchorage just above the bridge.

The Narraguagus River above Milbridge as far as the head of navigation at Cherryfield, about 4 miles upstream, is mostly bare at low water. It is seldom used by any craft, even small boats, with 3 feet maximum reported being taken to Cherryfield at high water, and then only with local knowledge.

Cherryfield (P.O.), is a town at the head of navigation on Narraguagus River. It has railway freight connections, and bus and telephone communication. The town is a center of salmon sport fishing. There is a sawmill and a cannery. An overhead telephone cable crossing the river a short distance below the highway bridge has a permit clearance of 21 feet.

Pigeon Hill Bay, about 6 miles southwestward of Nash Island, is entered eastward of Petit Manan Bar and northward of Petit Manan Island. The bay is easy of access by day and affords good anchorage in depths of 12 to 24 feet, but is seldom used except by local fishermen. The channel is unmarked except at the entrance. The small settlement of **Pigeon Hill** is on the west side of the bay. Small boats anchor on the west side of the bay off the settlement.

Whale Ledge, 1.4 miles south of Bois Bubert Island and on the east side of the entrance to Pigeon Hill Bay, is bare at half tide. A buoy marks a 13-foot spot 300 yards southward of the ledge.

Egg Rock, 1 mile south of Bois Bubert Island, shows at low water as a large ledge of dark boulders, with several high parts that are always out of water. There is a narrow channel between Egg Rock and Bois Bubert Island, but a stranger should not attempt passage.

Gull Rocks consist of a large ledge, bare at half tide, making off 0.2 mile from the shore of Bois Bubert Island about 1.4 miles northward of Egg Rock. These rocks can be avoided by keeping in mid-channel.

Pigeon Hill, the high, bare-topped hill on the western shore near the head of the bay, is conspicuous for some distance at sea.

The thoroughfare connecting the head of Pigeon Hill Bay with Douglas Island Harbor has been described previously.

Petit Manan Island, 7.7 miles southwestward of Nash Island, is low and bare, and marked by several buildings and **Petit Manan Light (44°22.1′ N., 67°51.9′ W.),** 123 feet above the water and visible 17 miles, shown from a gray granite tower on the east side of the island; a fog signal is at the light.

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Petit Manan Bar extends from Petit Manan Island to **Petit Manan Point** on the mainland. The bar consists of ledges and large boulders, between which is a channel, marked by two fairway buoys, that can be used by vessels of 8-foot draft at low water when the sea is smooth. The channel is 1.3 miles northwestward of Petit Manan Light and 0.9 mile southeastward of Petit Manan Point. The buoys can be left close-to on either side.

Another channel across the bar is 0.4 mile southeastward of Petit Manan Point; it is used by small local boats at all stages of the tide, but it is unmarked and difficult, and should not be attempted by strangers. The sea breaks along the whole length of the bar with a swell or in heavy weather, and the tidal currents set over it with considerable velocity, the flood northeastward and the ebb southwestward.

Green Island is 0.4 mile northwest of Petit Manan Island. **Petit Manan Pool,** on the southeast side of Green Island and north of Petit Manan Island, is a small-boat harbor. The pool is bare at low water, but the bottom is soft and boats ground out at low tide.

Simms Rock, 1.7 miles south-southeastward of Petit Manan Light, has a least found depth of 6 feet and is marked on its northwest side by a buoy. A sunken rock 0.2 mile southeastward is unmarked.

Southeast Rock, 3.2 miles southeastward of Petit Manan Light, has a least found depth of 5 feet, and is marked by a lighted whistle buoy. An unmarked 41-foot shoal is 1.7 miles southwestward of Southeast Rock.

Jackson Ledge, an unmarked danger 2.6 miles east of Petit Manan Light, has a least found depth of 23 feet.

Tibbett Rock, 3.6 miles east-northeastward of Petit Manan Light, has a least found depth of 12 feet and another rock, about 0.8 mile southeastward of it has a depth of 10 feet; both rocks are marked by buoys.

Jo Leighton Ground, an unmarked danger with a least depth of 14 feet, is 2.1 miles northeastward of Petit Manan Light.

6. PETIT MANAN ISLAND TO JERICHO BAY, MAINE

Chart 1202.—The coast between Petit Manan and Jericho Bay is indented by Frenchman Bay, Blue Hill Bay and numerous smaller bays and harbors. **Mount Desert Island,** between Frenchman and Blue Hill Bays, is mountainous and is the highest land feature on the coast of Maine. The summits are rounded, and several of them are nearly the same height, making it difficult to identify individual peaks at a distance. Much of the forest on the eastern half of the island was destroyed by the great fire of 1947.

Acadia National Park comprises the greater part of the southern half of Mount Desert Island, particularly the mountainous areas, and the lower half of Schoodic Peninsula, on the eastern side of Frenchmans Bay, including the scenic Schoodic Point. **Schoodic Mountain,** about 16 miles northward of Schoodic Point, is visible for a good distance off the coast.

Mount Desert Rock, 17.5 miles southward of Mount Desert Island and 11.5 miles outside of the nearest island, is a rocky islet about 20 feet high.

Mount Desert Light (43°58.1′ N., 68°07.7′ W.), 75 feet above the water and visible 14 miles, is shown from a conical gray granite tower on the rock. The fog signal and radiobeacon are synchronized for distance finding.

Columbia Ledge, 0.7 mile southward of the rock, has a depth of 18 feet, and is unmarked.

Boundary lines of inland waters.—The lines established for this section of the New England coast are described in **§ 82.5,** Chapter 2.

Chart 305.—The bight between Petit Manan Bar and Schoodic Peninsula is the approach to Dyer Bay, Gouldsboro Bay, and Prospect Harbor. Local fishermen are the principal users of these waters. Many rocks in the approach and tributaries have not been closely examined, and therefore, vessels should use caution when crossing broken areas where the charted depth does not considerably exceed the vessel's draft. The most important village is Prospect Harbor, although Gouldsboro and Steuben can be reached by small craft at high water.

Moulton Ledge, off the entrance to Dyer and Gouldsboro Bays and 3 miles westward of Petit Manan Light, is bare at low water, and is marked by a buoy west of the ledge. Broken ground, and several unmarked ledges, are in the vicinity of Moulton Ledge; and vessels should avoid this area. An 18-foot spot, 0.6 mile to the southward, a 17-foot rocky shoal 0.3 mile to the southeastward, and **Stone Horse Ledge** with 11 feet over it about 0.8 mile to the northward, are all unmarked.

Dyer Bay, westward of Petit Manan Point, has excellent anchorage in depths of 24 to 42 feet. The entrance, 3 miles northwestward of Petit Manan Light, and the bay are unmarked and seldom used except by small local vessels. A group of ledges and rocks, with narrow and deep passages between them, extend from the westward part way across Dyer Bay entrance.

A good passage nearly 0.5 mile wide is between Petit Manan Point and **The Castle,** the easternmost bare ledge. One mile above The Castle the channel narrows to a width of 250 yards because of rocks and ledges which extend out from both shores and have depths of 9 to 11 feet over them. Above this the channel widens to 0.5 mile, and then narrows gradually to 400 yards westward of **Sheep Island,** 3.3 miles north of The Castle. The least depth in the channel is about 18 feet, but a stranger should not attempt to enter at low water with a vessel of more than 9-foot draft. There are no commercial wharves in Dyer Bay.

Strangers can enter Dyer Bay with the aid of the chart in clear weather in daytime. Local knowledge should be obtained before attempting it at any other time, as there are many fishweirs, which are covered at or near high water.

Tidal currents are strong in the entrance of Dyer Bay, but follow the general direction of the channel except near **Dyer Point,** on the west side of the entrance, where they set in and out of Gouldsboro Bay.

The Castle, **Bonny Chess Ledge,** 300 yards west of The Castle, and **Little Ledge,** 0.5 mile west of The Castle, are bare ledges without distinguishing marks. **Yellow Birch Head,** on the east side of Dyer Bay near the entrance and 0.7 mile northeastward of The Castle, is a high, bare bluff.

Carrying Place Cove extends southeastward from Dyer Bay north of Sheep Island. The head of the cove, 300 yards from Pigeon Hill Bay, is nearly all soft mud and dry at low water.

Pinkham Bay, at the head of Dyer Bay, has numerous rocks and ledges. A narrow, crooked channel with a depth of 8 feet leads for some distance toward the head of the bay; the head of the bay is dry at low water.

Dyer Harbor, a shallow bight the upper part of which is dry at low water, is northwestward of Sheep Island and west of **Goods Point,** 0.6 mile northwest of Sheep Island. There is a pier at the cove on the west side of Goods Point, with 2 feet of water at the head. Gasoline can be obtained and water is available at a nearby well.

Gouldsboro Bay, separated from Dyer Bay by **Dyer Neck,** is 4 miles northwestward of Petit Manan Light, and 6 miles northeastward of Schoodic Island. An excellent anchorage may be had in depths of 12 to 54 feet. The bay is the approach to the villages of Gouldsboro

and Steuben, 6.5 and 7 miles, respectively, above the entrance. However, the approaches to the villages are unmarked, can be navigated only by small craft at high water, and are seldom used. Ice obstructs navigation in the bay from December to March. In severe winters the bay is closed to the entrance.

Sally Islands, a chain of small islands and ledges, extend across the entrance to Gouldsboro Bay. Included in the Sally Islands are **Eastern Island,** wooded on top and 0.5 mile southward of Dyer Neck; **Bald Rock,** a bare rock 700 yards westward of Eastern Island; **Sally Island,** rocky, with grass on top just southwestward of Bald Rock; and **Sheep Island,** thickly wooded in the center and 0.4 mile southwestward of Sally Island. Through the islands are two navigable channels, Eastern Way and Western Passage. When approaching from westward, care must be taken not to mistake the passages as the islands are difficult to recognize. The bay inside the islands is free from outlying dangers, and the water shoals gradually toward the head of the bay.

Eastern Way (Ship Channel) leads into Gouldsboro Bay between Eastern Island and Bald Rock. The passageway is about 350 yards wide between the 18-foot curves, and has a spot with a depth of 20 feet over it about 200 yards west of Eastern Island. The channel has strong **tidal currents;** when the current is ebbing, more especially with southerly and easterly winds, small craft, or those under sail alone, should not attempt the passage. The current sets diagonally across the channel.

Western Passage, with a least depth in the channel of 20 feet, leads into the bay between Sally Island and Sheep Island. The passage is about 100 yards wide, and is close along the eastern side of Sheep Island and westward of the ledges, bare at half tide, which extend about 500 yards west of Sally Island. It is not advisable for strangers to attempt it. The **tidal currents** run true with the channel and have a velocity of 2 to 3 knots at strength.

A passage from Dyer Bay to Gouldsboro Bay north of Sally Islands is obstructed by rocks, partly bare at low water. The rocks extend 300 yards southward and southwestward from the southern end of Dyer Neck, and a shelving ledge extends 250 yards northeastward from Eastern Island. The narrowest part of the channel, northward of Eastern Island, is about 250 yards wide.

To enter Gouldsboro Bay, a depth of over 20 feet can be carried into the bay through the Eastern Way, and 20 feet through the Western Passage. The tidal currents have a velocity of 2 to 3 knots at strength through these passages, and in Eastern Way they set diagonally.

Approaching from eastward and entering through Eastern Way from off the fairway bell buoy southward of Petit Manan Light, steer **312°** for a little over 4 miles. The tidal currents set across this course with considerable velocity, the flood northeastward and ebb southwestward. Change course as necessary to pass midway between Eastern Island and Bald Rock. When inside the islands, steer a little more northward and stand up the middle of the bay. The water shoals gradually toward the head, and anchorage can be had anywhere between the entrance and Point Francis by giving the shores a berth of 500 yards.

Approaching from westward and entering through Eastern Way, from the whistle buoy off Schoodic Island, steer **046°** for 4.4 miles, passing 0.4 mile southeastward of Little Black Ledge to a position where Cranberry Point is in line with Prospect Harbor Light. Then steer **028°** for the eastern end of Eastern Island until about 500 yards from the island, and then round up to the northward to pass midway between Eastern Island and Bald Rock. Then proceed as directed in the preceding paragraph. Strangers should have no difficulty in making the passage with the aid of the chart in clear weather in daytime.

Point Francis, on the western shore of Gouldsboro Bay 3.2 miles above Sally Islands, is high and wooded, and is prominent from the lower end of the bay.

Joy Bay, a shallow body of water 1.5 miles long, extends northward from Gouldsboro Bay at **Rogers Point,** 1.5 miles north of Point Francis. Two coves are at the head of Joy Bay; **Steuben Harbor** (P.O.), the head of which is the village of **Steuben,** extends northeasterly, and **Joy Cove** extends westerly. The narrow, crooked, unmarked channel through Joy Bay and Steuben Harbor is nearly bare at low water and seldom used. Steuben can be reached at high water by vessels of 7 to 8 feet draft.

West Bay (Gouldsboro Harbor) a large shallow arm of Gouldsboro Bay, extends northwestward from the bay for about 2.5 miles. The village of **Gouldsboro** (P.O.), on the western side of the bay near its head is of no commercial importance. The entrance has numerous ledges and rocks. The narrow, crooked, unmarked channel in the bay is nearly dry at low water and is seldom used.

Corea Harbor is a small cove between Gouldsboro Bay and Prospect Harbor. A number of grassy islands, including **Bar, Outer Bar,** and **Western Islands,** are off the entrance to Corea Harbor. The harbor is well protected. **Corea** (P.O.) is a small village at the head of the harbor. The principal industries are fishing and lobstering. The most prominent objects are a church spire and a group of houses at the head of the harbor, which are visible for a considerable distance offshore.

The unmarked channel into the harbor leads to the westward of Western Island and then along the northeastern side of the entrance. A ledge in the middle of the entrance is cleared by keeping close to the northeastern side of the entrance. Lobster pots which are usually placed on the edge of the ledge are a good indication of the location of the channel. Low water is the best time to enter.

A Federal project provides for an anchorage 8 feet deep in the middle of the inner harbor. The controlling depth is about 7 feet. The harbor outside the limits of the anchorage has shoaled considerably. The moorings in the harbor are administered by the harbormaster.

An overhead power cable, with a permit clearance of 25 feet, crosses the cove on the northeast side of the inner harbor. A telephone cable is strung on the same poles about 10 feet below the power cable.

Ice usually obstructs the inner harbor from December to March, but fishing is carried on during the winter from piers on both sides of the entrance to the harbor.

There are numerous piers in the harbor, most of which dry at low water. A wharf on the northeast side of the entrance has a float landing with 9 feet alongside. An old lobster pound with wharf dry at low water and a wharf with float landing with 3 feet alongside is on the western side of the entrance. Gasoline and diesel oil are obtainable at these wharves. Food and some supplies are available. There are no boatyards or marine railways. Customs are usually attended to by the officer at Jonesport. The village has telephone communication.

Prospect Harbor, 4 miles north-northeastward of Schoodic Island and 6 miles northwestward of Petit Manan Light, is a large deep-water bight, about 1 mile in extent between Cranberry, Petty, and Prospect Harbor Points. It has ample depth and offers good anchorage for the largest vessels, but is exposed to southerly and southeasterly weather.

The town of **Prospect Harbor** (P.O.) is at the head of the harbor. The upper part of the harbor is divided into 2 coves by **Prospect Harbor Point. Sand Cove,** the eastern branch, has ample depth, until near the head, with its west side obstructed by rocky ledges.

Prospect Inner Harbor, the western branch of the harbor, is used commercially on its western shore; the upper half being obstructed by unmarked rocky ledges. There is no shipping, but fishing and lobstering are of importance.

The houses around the head of the harbor, the spire of the Community House, and the chimney of the cannery are conspicuous.

Prospect Harbor Point Light (44°24.2′ N., 68°00.8′ W.), 42 feet above the water and visible 12 miles, is shown from a white conical tower on the point. The unoccupied former residence buildings of the light station are conspicuous behind the light. The light has two white sectors, which show on either side of the ledges off the harbor, and indicate the fairways into the harbor.

A fairway bell buoy, about 0.3 mile southward of the light, marks the entrance to the inner harbor.

Anchorage can be found, as appropriate, anywhere in the outer harbor, and in soft bottom, in the entrance to the inner harbor about 200 yards northward of a line between **Clark Ledges Daybeacon** and the end of the cannery wharf on Clark Point.

Little Black Ledge awash, **Big Black Ledge,** showing 5 feet above high water, and **Old Man** and **Old Woman,** partly bare at low water, are unmarked ledges off the entrance to Prospect Harbor. A gong buoy is off the southwest side of Old Woman Ledge. The white sectors of Prospect Harbor Point Light cover the fairways either side of these ledges.

Clark Ledges, extending 500 yards eastward of Clark Point, on the southwestern side of the entrance to the inner harbor, are marked by a buoy and a daybeacon on their easterly side.

Pilotage is not compulsory, or necessary, as approach to the harbor and the anchorage can be readily made with the aid of the chart in daytime in clear weather; at night the white sectors of Prospect Harbor Point Light clear all dangers in the approaches. Ice seldom obstructs the harbor.

Customs are attended to by an officer from Jonesport or Bar Harbor. There is a harbormaster, and the moorings are under his control.

There are a number of private piers and commercial wharves. There is reported to be a depth of 12 feet at the cannery wharf on Clark Point, and 5 feet at the wharf just inside the point. Gasoline, diesel oil, water, and provisions are available.

Birch Harbor, on the western side of Prospect Harbor about 1 mile south of Inner Harbor entrance, has a depth of 6 feet for 0.5 mile and then shoals rapidly above this point. **Birch Harbor** (P.O.) is a small settlement of fishermen near the head of the harbor. The landings are bare at low water. The channel is unmarked and difficult. The best water in entering favors the southwest side to avoid **Roaring Bull,** a rock bare at extreme low water off the entrance. A church spire at the head of the cove is conspicuous.

Bunker Harbor, on the west side of Prospect Harbor 0.8 mile south of Birch Harbor, has a small settlement of fishermen at the head. The landings are bare at low water. The entrance is obstructed by ledges. The outer ledge is **Bunker Ledge,** partly bare at low water only; a buoy is off the eastern side. Inside of Bunker Ledge are ledges awash at high water. The channels into the harbor are unmarked, and the one northward of the ledges in the entrance is said to be the best.

Schoodic Harbor, between Prospect Harbor and Frenchman Bay, has ample depth but is exposed to the sea and never used as an anchorage. Small fish wharves are at the head of **Wonsqueak Harbor,** the northeastern part of Schoodic Harbor. An overhead power cable, with a permit clearance of 26 feet, crosses the cove just northward of the fish wharf. Several islands and ledges are in the entrance to Schoodic Harbor.

Schoodic Island, 7.5 miles west-southwestward of Petit Manan Island, is low, wooded on the south end, and grassy with a lone tree on the north end. The island is bordered by extensive ledges. **Schoodic (Abbots) Ledge,** 0.4 mile northward of Schoodic Island, is covered near high water and breakers are always visible on it. The channel between Schoodic Island and Schoodic Ledge is marked by a buoy on either side. It has ample depth and is generally used by small local vessels and motorboats bound along the coast.

Middle Ledge, 0.8 mile north of Schoodic Island, is bare at about half tide, and unmarked. **Brown Cow,** a rocky ledge, about 800 yards south of Spruce Point, on the northeastern side of the entrance to Schoodic Harbor, is marked by a buoy. **Roland (Rolling) Island,** north-northwestward of Schoodic Island is wooded.

Chart 306.—Frenchman Bay, westward of Schoodic Peninsula and eastward of Mount Desert Island, is the approach to the towns and important summer resorts of Bar Harbor, Winter Harbor, Southwest Harbor, Northeast Harbor, and many smaller villages. The bay is fre-

quented by yachts, small pleasure craft, and fishing vessels, and in summer is the scene of many sailing yacht races. The bay proper is about 10 miles long and has an average width of about 4 miles. Near the center of the bay, a group of islands extends across the bay; between the islands are two good channels. Vessels of the largest size and deepest draft can find an anchorage. Navigation is not difficult for strangers.

The principal guides to the entrance of Frenchman Bay from the sea, are the lighted whistle buoy, about 7 miles southeastward of Schoodic Point, the lights on Mount Desert Rock, Great Duck Island, Baker Island, and Egg Rock. A brief description of Mount Desert Island and Mount Desert Rock is given in the first part of this chapter.

Cadillac Mountain, 1,532 feet high, is the highest point on Mount Desert Island and the highest point along the east coastline of the United States. On a clear day the mountain is visible from 35 to 45 miles seaward. An excellent scenic highway leads from Bar Harbor to the summit of Cadillac Mountain.

Schoodic Head on **Schoodic Peninsula,** across the bay from Mount Desert Island is 437 feet high, and is the most prominent land feature at the eastern entrance to the bay.

Big Moose Island, the southern extremity of Schoodic Peninsula, is part of the Acadia National Park. Two radio towers, an elevated tank, and the observation spot on the southern extremity of Big Moose Island, are conspicuous, and are visible well off the coast. **Little Moose Island,** a rocky grass covered island, with a few trees and a shack on it, is about 0.3 mile eastward. The bight between the two, **Arey Cove,** is unsafe in southerly weather.

The principal entrance to Frenchman Bay is from southward, between Schoodic Peninsula and Baker Island, but small vessels can enter from southwestward through Western Way. Small boats also may enter the head of Frenchman Bay at high water through Mount Desert Narrows.

Anchorages.—Winter Harbor is a good anchorage, and is frequently used by vessels entering for shelter; it is usually open throughout the winter. Bar Harbor is partially protected, except against heavy southeasterly winds, but has poor holding ground except near the head of the harbor. Large vessels sometimes anchor northward or northwestward of Bar Island. Stave Island Harbor is a good anchorage. Southwest Harbor is a well sheltered and frenquently used anchorage.

Frenchman Bay is rocky, but the water is deep and in general free from dangers except near the shores. The main part of the bay, from a little southward of Egg Rock Light to the entrances of Skillings River, Sullivan River, and Eastern Bay, including the channels between Jordan and Long Porcupine Islands, and between Burnt Porcupine and Sheep Porcupine Islands, has been examined by means of a wire drag. The tributaries, with the exception of the main part of Winter Harbor and the channels northward and southward of Sutton Island, have not been examined by means of a wire drag, and vessels navigating the tributaries should proceed with caution when crossing areas where the charted depth does not considerably exceed the draft.

Little difficulty should be experienced in approaching and entering Frenchman Bay at any time, as the approaches are clear, and outlying dangers, for the most part, well marked.

The mean range of the tide is about 10.5 feet. Between Bar Harbor and Ironbound Island the average flood current velocity is less than 0.3 knot. The average ebb velocity at strength is about 0.7 knot and sets southeastward. For current predictions see the Tidal Current Tables.

During mild winters Frenchman Bay is usually clear of ice to Skillings River, but the bays and rivers connected to the northern part of the bay are frozen over. Winter Harbor is reported to be always clear. It is reported that during foggy weather Frenchman Bay usually clears during the day although the fog remains heavy outside Schooner Head and Ironbound Island. No licensed pilots are available and none are needed to enter. Local fishermen usually can be engaged as pilots for the tributaries.

Chart 204.—Winter Harbor, on the eastern side of Frenchman Bay just inside the entrance, is a frequently used harbor of refuge. The principal entrance from southward is deep and free of dangers. The entrance from the northward is used only by local vessels of 12-foot draft or less. The aids in the northern approach are colored and numbered for vessels bound north. Good anchorage in depths of 30 to 54 feet, good holding ground, will be found in Winter Harbor. The harbor is comparatively free of danger and, although open to the southward, a heavy sea never enters; ice seldom interferes with navigation.

Turtle Island, wooded, is on the western side of the main entrance to Winter Harbor and 0.8 mile west of Schoodic Peninsula. **Turtle Island Ledge,** bare at half tide, extends 500 yards off the southwest side of the island; a gong buoy is southward of the ledge.

Mark Island, 0.5 mile west of Schoodic Peninsula and on the west side of the entrance to Winter Harbor, is grassy and marked by Winter Harbor abandoned lighthouse. The abandoned lighthouse, a white tower 19 feet high and connected with dwelling, is prominent. A lighted bell buoy is 0.2 mile south-southeast of the tower. Depths of 12 to 16 feet are up to 300 yards south-southeast of the tower.

Of the islands northward of Turtle and Mark Islands, **Ned Island,** 0.1 mile north of Mark Island, and **Heron Island,** 0.5 mile northwestward of Turtle Island, are wooded. **Spectacle Island,** just north of Turtle Island, has a house on it and is wooded. The other islets, including **Flat** and **Crow Islands,** are grassy or bare rocks, the largest of the Crow Islands having a few trees on it. All the islands are surrounded by extensive ledges, bare at various stages of the tide.

The channel between Turtle Island, and Mark and Ned Islands is not recommended because of unmarked 16- and

17-foot spots in midchannel, about 350 yards westward of the north end of Mark Island. **Roaring Bull,** a shoal about 200 yards off the northwestern end of Ned Island, has minimum depths of 3 feet, breaks during southerly and easterly weather, and is marked by a buoy off the northwest side.

Grindstone Neck, forming the western side of Winter Harbor, is wooded and has many summer residences and a club hotel. A standpipe on the summit is conspicuous. It is thin and from a distance appears as a stack, or pillar monument. A round gray house, built to resemble a lighthouse, with a glass cupola on top, is located on the west side of Grindstone Neck, about 700 yards west-northwestward of the standpipe. It is conspicuous from the southwestward in Frenchman Bay.

Grindstone Ledge, which bares at half tide, extends 400 yards southwestward from Grindstone Neck, and is marked by a daybeacon, on the ledge and a buoy south-southwestward of it. A 12-foot shoal is 235 yards southward of the daybeacon, and in the middle of the channel between Ned Island and Grindstone Ledge. A narrow channel, with a depth of 16 feet, is almost midway between the daybeacon and **Grindstone Point,** the southeastern extremity of Grindstone Neck. This channel should not be used without local knowledge. The channel south of the ledge and the buoy is the recommended passage.

Pulpit Ledge, about 150 yards westward of Grindstone Neck, is marked by a daybeacon on the ledge and a buoy on its eastern side. The narrow channel, between the ledge and the neck, is used only by small local craft.

The eastern shore of Winter Harbor from **Frazer Point,** 0.6 mile northeastward and on the opposite side of the harbor from Grindstone Point, to Abijah Ledge, 0.5 mile northward, should be given a berth of more than 150 yards. **Abijah Ledge,** near the head of Winter Harbor, is about 300 yards off the eastern shore. A buoy is westward of the ledge. Shoal water extends from the ledge to the small cove northeastward.

Sand Cove, on the northwest side at the head of Winter Harbor, affords the best anchorage with an excellent holding bottom of black mud. Shoal water extends 100 yards off **Harbor Point,** the eastern entrance point of the cove. A buoy is southeastward of the point. Only piling, for the most part submerged, remains of an abandoned wharf on the west side of the cove. The remains of a wharf and a shore-side swimming pool, dry at low water, are close northward of the old pier. Winter Harbor Yacht Club, with pier and float landing with 22 feet alongside, is on the west side of Sand Cove. Water is piped to the float. Fishweirs obstruct the upper, shoal, end of the cove.

Winter Harbor Cove, locally known as **Little Harbor,** northeastward of Sand Cove, is entered between **Guptill Point** and Harbor Point, 300 yards southward. A buoy marks the ledge extending southeastward from Harbor Point. **Guptill Ledge,** extending southward and southeastward from Guptill Point, is marked by a daybeacon on the ledge and a buoy off its southeastern end. The cove is secure in all weathers, and is extensively used by fishing craft, yachts, and pleasure craft. The town wharf with float landing, with 5 feet alongside, is on the west side of Guptill Point, just inside the entrance. Another wharf, with 3 feet at the float, is on the north side of the cove near the head.

Henry Cove, at the head of Winter Harbor eastward of Guptill Point, is wider, but less sheltered, than Winter Harbor Cove, has good holding ground in soft mud but is open to southerly winds. Reefs and shoal water extend about 60 yards from shore on both sides of the entrance. The northern end of the cove is extremely shoal, with the upper 300 yards dry at low water. A large wharf, with 9 feet at the head, is on the east side of the cove. A small boatyard with marine railway is at the head of the cove. Dry at low water, craft up to 60 feet in length and 6 feet in draft can be hauled out at high water. Hull, engine, electric and electronic repairs can be made, and open and covered winter storage is available.

The town of **Winter Harbor** (P.O.) is at the head of the harbor. The principal industries are fishing and lobstering. The homes on Guptill Point, the church spire, and a large private boatshed at the head of Henry Cove are the most prominent objects. Gasoline and diesel oil, water, provisions, and ship chandlery are available. Water is piped to the town wharf during the summer months. There is a harbormaster. It is reported that the harbor is seldom obstructed by ice.

Winter Harbor is deep and clear from the entrance to the recommended anchorage in Sand Cove. Little trouble should be experienced when entering at any time, with strict attention to the charts and the aids, which mark most of the important dangers. To enter Winter Harbor Cove and Henry Cove, midchannel courses are recommended, but only small craft should enter these coves for anchorage.

Chart 306.—Egg Rock, about 2 miles west of the entrance to Winter Harbor is bare and low. **Egg Rock Light (44°21.2′ N., 68°08.3′ W.),** 64 feet above the water and visible 14 miles, is shown from a white square tower, on a dwelling on the island. It is the most prominent leading mark for this section of the bay. A fog signal is at the light. **Handiron Ledge** extends about 200 yards northeast of Egg Rock, and another ledge extends southwestward from the rock for about 500 yards. Parts of both ledges bare at low water. A whistle buoy is 1 mile southward from Egg Rock Light.

Ironbound Island, 1.5 miles northward of Egg Rock Light, is the largest of the islands in Frenchman Bay, is thickly wooded, and has high vertical cliffs. **Cod Ledges,** eastward of Ironbound Island, have two critical spots with depths of 10 and 11 feet. Vessels should pass to the eastward of the buoy on the eastern side of the ledges. A shoal with a depth of 12 feet is about 250 yards off the east shore of Ironbound Island at a point 0.6 mile northeast of **Seal Cove,** a bight in the southeastern side of the island.

Shoal water extends 100 yards north of **Fish Point,** on the west side of Ironbound Island, and along the cove eastward from the point. A ledge, extending northward from the north end of the island, has depths of 6 feet at a distance of 200 yards off the shore. A buoy, northward

of the ledge, marks the southern side of the northwestern entrance to Halibut Hole.

Halibut Hole is the passage between the north end of Ironbound Island and **Jordan Island,** 0.2 mile northeastward. The passage is deep and clear with the exception of a rock with a least found depth of 13 feet on the northeast side of the passage, 180 yards off the south shore of Jordan Island. The ledge shoals rapidly northward to the beach. The channel is southward of the rock.

Local magnetic disturbance.—Differences of as much as 3° from the normal variation have been observed in the vicinity of Jordan Island.

Stave Island Harbor is an excellent harbor of refuge on the eastern shore of Frenchman Bay. The mainland is on the east, Jordan Island is on the south, and **Stave Island,** 1.4 miles north of Ironbound Island, is on the north. The anchorage has a depth of 21 to 37 feet, soft bottom, and is sheltered from all winds; it is used considerably as an anchorage.

The main entrance to Stave Island Harbor is between Stave and Jordan Islands. An unmarked rock, covered by 25 feet of water, is nearly midway between Jordan and Stave Islands, the deeper channel being southward of it. **Yellow Island,** 200 yards westward from the north end of Jordan Island, is so named from the color of its rocks. The island is wooded. A ledge with spots that bare at low tide is 150 yards south of Yellow Island.

Approaching Stave Island Harbor from southward, the mariner will find a broad, clear channel between Ironbound and Long Porcupine Islands; the approach northward of the Porcupines is also clear. The passage from Stave Island Harbor to Flanders Bay east of Stave Island is not navigable except for small craft at high water. The north end of the harbor eastward of Stave Island is shoal. There is a narrow channel into the harbor from southward over **Jordan Island Bar,** between Jordan Island and the mainland. The channel which is used only by small local craft has a depth of about 3 feet and is 100 yards off Jordan Island.

Summer Harbor is a small settlement on the east side of **Summer Harbor (Hammond Cove),** in the southeastern part of Stave Island Harbor. The cove is clear with the exception of a rocky ledge, with a depth of 7 feet, making out 200 to 400 yards from shore, the northwestern end of which is marked by a buoy.

South Gouldsboro (P.O.) is a village on the northeastern shore of Stave Island Harbor. A wharf and an inactive fish cannery are in this village, and the stack of the cannery is prominent.

Calf Island, 0.7 mile northwestward of Stave Island, is wooded except on the south where it is low and bare. A house and barn on the southeast side are visible from southward. **Little Calf Island** and **Thrumcap** are partly wooded islands on the extensive shoal extending southward from Calf Island.

Flanders Bay, on the northeast side of Frenchman Bay, is protected by Stave and Calf Islands. An excellent anchorage may be found but the bay is seldom used except by small craft. The villages of West Gouldsboro and East Sullivan are on the eastern shore. The bay can be entered through a narrow channel across Calf Island Bar between Calf and Stave Islands, or around the north end of Calf Island. The channel northwest of Calf Island has the best water, but the channel southeastward of the island, across **Calf Island Bar** is shoal and has a depth of 8 feet in a buoyed channel.

An extensive chain of bare and sunken ledges extends through the middle of Flanders Bay from the north end to near the south end. **Halftide Ledge,** the southerly ledge, is bare at half tide; a buoy is off its southeast end. The channel through the bay is eastward of the buoy.

Long Ledge, 0.4 mile northwest of Halftide Ledge, is partly bare at high water. The ledge southward of Long Ledge has a depth of 5 feet. Between the 5-foot ledge and Long Ledge is an opening having a least found depth of 19 feet.

Soward Island, at the northwest side of Flanders Bay, is connected to **Waukeag Neck** by a fixed bridge having a clearance of 4 feet. The area between Soward Island and Long Ledge is foul. **Junk of Pork,** a small dirt cone of unusual appearance, **Sheldrake Island,** and **Ash Island** are in the area. A buoy is on the eastern side of the foul area.

Hall Point, marked by prominent residences, is on the southeast end of **Schieffelin Point (Ash Neck),** on the northeast side of the bay. An elevated tank on the neck is also prominent.

West Gouldsboro (P.O.) is a village at the head of **Jones Cove,** the southeasterly tributary of Flanders Bay. There is a depth of 4 feet to within 500 yards of the village; above this point the channel is bare at low water. The channel is unmarked and difficult, and seldom used even by local boats.

East Sullivan (P.O.) is a village at the northern end of Flanders Bay. A white church with belfry is conspicuous near the northwestern end of the bay.

Eastern Point Harbor is a sheltered anchorage for small craft between Waukeag Neck and the eastern end of **Preble Island,** 0.3 mile west of Calf Island. The head of the harbor is shallow, and is separated from Sorrento Harbor by a partly dry reef. The cove on the northwest end of the harbor has been dammed up for a lobster pound. On the north side there is a boatyard, with three boat sheds and marine ways, that can build, or haul out for repairs, craft up to 35 feet in length, or provide winter storage.

Sorrento Harbor is a small anchorage, used by small pleasure craft in summer, on the north side of Frenchman Bay north of Preble Island and **Dram Island,** 0.2 mile west of Preble Island. In bad easterly weather the excursion launches from Bar Harbor sometimes anchor here.

The entrance from southward favors Dram Island slightly, and is narrowed by reefs bare and low water extending 100 yards from Preble Island and 50 yards from Dram Island. A fairway bell buoy is off this entrance.

The entrance from westward is narrowed by a reef, partly showing at high water, which extends 175 yards from the north side of the entrance. The best water in

this entrance is found 100 yards north of Dram Island on a **091°** course. A buoy is off **Dram Island Ledge,** 0.2 mile west of Dram Island. A small ledge, nearly bare at low water, has been reported, about 100 yards north of the western end of Preble Island.

Sorrento (P.O.), a summer resort on the north side of Sorrento Harbor, is frequented by small yachts. Some piling of the former steamer wharf are submerged and above water off the north shore opposite the west end of Preble Island. A town wharf and float having about 7 feet alongside is on the point east of the old steamer wharf ruins. The yacht club uses the town wharf, which has water piped to it. Gasoline and provisions can be obtained in the village.

Sullivan Harbor is an arm of Frenchman Bay making northward from the north end. It is the approach to the villages of Hancock Point, Mount Desert Ferry, Sullivan, and Franklin. The least depth to the falls just above Sullivan is about 25 feet. The channel to Sullivan is marked by a daybeacon and buoys.

The main entrance to Sullivan Harbor is between Bean Island and Crabtree Ledge unused lighthouse foundation pier. Vessels also can enter by the buoyed channel eastward of Bean Island, but this channel is seldom used. The channel from the entrance to Sullivan has ledges bare and submerged on either side, but has ample depth and is well marked.

Bean Island, in the middle of the entrance to Sullivan Harbor, is partly wooded. The channel used most frequently is westward of the island. **Bean Ledge,** 0.2 mile eastward of Bean Island, shows at high water.

Crabtree Ledge, on the west side at the entrance to Sullivan Harbor and 0.4 mile west of Bean Island, is marked by the black foundation pier of a former lighthouse. Although the tower has been removed, the foundation pier makes a good daymark. A bell buoy is just east of the ledge.

Hancock Point is the southeastern extremity of Crabtree Neck. The village of **Hancock Point** has many summer residences and a post office open only in summer. There is a town wharf with a float landing, which has 7 feet alongside, about 0.4 mile northward of the point. There is a harbormaster who supervises the moorings.

Mount Desert Ferry, the former terminus of the rail-steamer service to Bar Harbor, is a settlement on McNeill Point, about 1.7 miles northward of Hancock Point. The wharf is in ruins, with only three isolated dolphins remaining, with no connection to shore. There is reported to be a depth of 18 feet at the dolphins. The large building of a former oil distributing plant on the point is conspicuous.

Sullivan (P.O.) is a small village on the north side of Sullivan Harbor, 3 miles above the entrance; the wharves are in ruins.

Sullivan Falls, the contracted section of the river, 0.5 mile above Sullivan, is said to have a depth of about 7 feet, but is obstructed by ledges, and the tidal currents are dangerous. Navigation through the falls is safe at slack water only. Vessels using the channel go in and out at high-water slack. Small boats sometimes go in on the flood but always come out at high-water slack. The cove on the west side just at the bottom of the falls has a lobster pound, and there is a wharf and float landing, with 15 feet alongside, on the north side of the entrance. Gasoline and water are available on the wharf.

The channel is unmarked above Sullivan, has dangerous ledges on both sides, and is unsafe without local knowledge.

The mean range of tide is about 10.5 feet below Sullivan Falls, and about 6.5 feet above. The tidal currents through the falls are dangerous at strength. High-water slack is 1 hour and 20 minutes, and low-water slack 1 hour and 45 minutes later in the falls than below them. Ice obstructs navigation in Sullivan River during January, February, and March.

West Sullivan (P.O.), on the north side of the river just above Sullivan Falls, has several quarries at which vessels formerly loaded. A highway bridge across the river about 0.5 mile above the falls, has a swing span with a clearance of 11 feet; operation regulations are given in **§ 203.3,** Chapter 2. The bridge connects West Sullivan with the town of Hancock and the railroad freight terminus of **Waukeag,** where there are gasoline tanks and a freight office. The customs duties for Hancock are handled by an officer from Bar Harbor.

Chart 1202.—Taunton Bay, an expanded section of Sullivan River, is about 6 miles above Bean Island. An unmarked channel with a depth of about 8 feet leads through the bay to near the head. The bay outside of this channel is bare, or nearly so, at low water. The granite quarries along the east side of the bay have been abandoned. **Franklin** (P.O.) is a town on the railroad at the head of **Taunton Bay.**

Chart 306.—Skillings River is an arm of the northern part of Frenchman Bay westward of Sullivan Harbor. The entrance is 1.7 miles wide between **Hancock Point** on the east and **Meadow Point** on the west, but it contracts rapidly to a width of 400 yards at **Pecks Point,** about 2 miles above Crabtree Point. Above this the river leads about 4 miles in a northwesterly direction to North Hancock.

The channel above Pecks Point is narrow and crooked, and has numerous rocks and ledges, making navigation difficult. Strangers wishing to enter the river should anchor 1.5 miles above Hancock Point in depths of 30 to 42 feet and get a pilot from among local boatmen. The river is unmarked, and is seldom used except by local fishing craft. The wharves usually are small and bare at low water. Strangers in small craft can enter with the aid of the chart.

Raccoon Cove is a large shallow cove on the west side of Skillings River, near the entrance. The cove is obstructed by **Shooting Ledge** and other ledges as well as by many fishweirs.

Large commercial lobster pounds have been formed by damming the two bights at and immediately south of **Youngs Point,** 3 miles above Hancock Point, at the entrance to **Youngs Bay.**

Hancock (P.O.), and **North Hancock** are villages along the main road, and have no business by water.

Eastern Bay, together with Mount Desert Narrows, forms a thoroughfare from the head of Frenchman Bay to Blue Hill Bay, north of Mount Desert Island. **Googins Ledge**, nearly 0.5 mile long and bare in the center at low water, is near the center of the bay. A buoy is on the southwest side of the ledge. The channel leads southward of the buoy. Except for Googins Ledge the bay is mostly deep and clear in midchannel to the entrance of Mount Desert Narrows, but the eastern half is open and unprotected in easterly and southeasterly weather.

Good anchorage for deep-draft vessels is available between Googins Ledge and a position northwestward of the ruins of the old Naval coaling station wharf in depths of 36 to 54 feet. There is also good anchorage about 0.3 mile from shore off the entrance of Salsbury and Emery Coves in depths of 42 to 48 feet.

The north shore of Eastern Bay for 0.7 mile west of Meadow Point is foul; a rock baring 9 feet at low water is 0.2 mile offshore.

Lamoine Beach extends about 0.6 mile westward of Meadow Point. At the western end, there is a pier, which dries at low water, and a boatyard. A boatshed with marine railway is on the beach just eastward of the pier. **Lamoine State Park**, which includes the grounds of the old Naval coaling plant, is about 0.8 mile westward of Lamoine Beach. The old coaling pier is in ruins, only steel piling and underpinning remaining. Many rows of the steel piling set in heavy concrete bases have been cut off just below the low water mark. These obstructions are reported to extend up to 50 feet beyond the visible piling, and being unmarked, present a serious hazard. The ruins of the pier should be given a berth of at least 200 feet. The stone foundations of the plant are still visible, and together with three white adjacent buildings, are conspicuous.

Sand Point is on the south shore of Eastern Bay at the entrance. A boatyard at the point can haul out craft up to 75 feet in length and 10-foot draft for hull or engine repairs, or dry open or covered winter storage. Electric and electronic repairs can be made. **Salsbury** and **Emery Coves** are 0.8 mile and 1.1 miles westward of Sand Point. On the point between these two coves is a biological experimental station with a float landing.

At **Hadley Point**, 2.2 miles west of Sand Point, Eastern Bay merges into Mount Desert Narrows. **Berry Cove** makes into the northern shore opposite Hadley Point. Good anchorage can be had in 18 to 24 feet off the entrance to this cove which is shallow at its head. A pier with float landing, a small private marine railway, and a lobster pound are on the east side of Berry Cove.

Chart 307.—Mount Desert Narrows, northward of Mount Desert Island, connects the head of Frenchman Bay with the head of Blue Hill Bay. The passage is crossed by a fixed highway bridge and causeway. The bridge span over the navigation channel has a clearance of 25 feet. Overhead power cables cross on poles on the west side of the bridge.

The channel is nearly bare at low water with scattered boulders and ledges of rock, and is used at high water by boats up to 9-foot draft. It is narrow and difficult, and fringed with reefs. Strangers should not attempt passage with drafts greater than 4 or 5 feet, and should go through on a rising tide. The mean range of tide is about 10.5 feet. The current sets westward on the flood and eastward on the ebb.

Passage through Mount Desert Narrows, from Frenchman Bay to Blue Hill Bay, should not be attempted by strangers without local knowledge. The channel approaches to the bridge from Thomas Island past Trap Rock to deep water in Blue Hill Bay, southward of Haynes Point, is narrow, treacherous, difficult, and unmarked. The most favorable time is at high-water slack, as the current at other times is strong and turbulent.

Jordan River, making northward from Mount Desert Narrows, just west of Berry Cove, has a narrow, crooked, and unmarked channel, and is dry at low water for almost half of its upper length above Lamoine. Local knowledge is necessary for its navigation. The few wharves are in ruins. Bar Harbor Airport is on the west side of the river entrance. The buildings, control tower, and light beacon tower of the airport are conspicuous.

Chart 306.—Cape Levi is on the northeastern shore of Mount Desert Island 1.2 miles east-southeastward of Sand Point. **Sunken Ledge** with a depth of 5 feet is 0.5 mile north-northwestward of the cape, and is marked on its north side by a buoy. From Cape Levi to Lookout Point, 0.6 mile southward, **Halftide Ledge**, a triangular shaped shoal, with scattered boulders, makes out from the shore for about 0.6 mile, where it is marked by a buoy. All craft should avoid it.

Chart 205.—Hulls Cove is a broad open bight on the northeast side of Mount Desert Island. Several dangers are off the cove, but they are marked by buoys. The cove shoals rapidly from the entrance to the head, and the low water line extends about 200 yards from its head. Piling of an old fishweir obstructs most of the cove. There is a small private marine railway and boatshed on the south side of the cove near the head.

The Bar Harbor Yacht Club is at **Canoe Point**, the southern point of the entrance to the cove. A float landing at the club pier is reported to have 20 feet alongside. A shoal, with a least depth of 2 feet, just off the entrance to Hulls Cove, is marked on its south side by a buoy. Passage into the cove is on either side of the shoal.

Bald Rock, 20 feet high, is 1.4 miles east of Lookout Point. A buoy is northward of two rocks just north of Bald Rock. **Bald Rock Ledge**, about 0.5 mile in width, is 0.3 mile southwest of Bald Rock. The high part of the ledge bares at low water. A buoy is on the southwest side of the ledge. The passage between Bald Rock and Bald Rock Ledge is dangerous without complete local knowledge.

The shoreline from Hulls Cove to Bar Harbor is backed

by many large summer residences, and the ruins of several others which were destroyed in the 1947 fire. The area between Bald Rock Ledge and Bar Island is used as a yacht anchorage, it being much safer anchorage than Bar Harbor.

Bar Harbor is an anchorage on the eastern side of Mount Desert Island, 3.5 miles above Egg Rock Light. The east shore of Mount Desert Island is on the west, **Bar Island** and **Sheep Porcupine Island** are on the north, and a breakwater extending southwesterly from **Bald Porcupine Island** across **Porcupine Dry Ledge** to within 250 yards of the shore is on the south. The breakwater is awash at high water and is not marked. All the islands surrounding Bar Harbor are high and wooded, and have no prominent marks. When approaching from southward, Bald Porcupine Island is distinguishable because of its bare rocky slopes. The bar extending between Bar Island and the town consists of scattered boulders on soft bottom. Automobiles drive from the town, at low water, to the national park, which occupies the western half of Bar Island.

The principal entrance is from the eastward, between Bald Porcupine and Sheep Porcupine Islands, and is clear. Local vessels sometimes enter from northward, between Sheep Porcupine Island and the small islet eastward of Bar Island, where the depth is 13 feet in midchannel.

A deep channel, about 150 yards wide, extends into the harbor between the western end of the breakwater and the shore of Mount Desert Island. This passage is used sometimes by local craft. The breakwater is not marked, and extreme caution should be exercised when using this passage. It is reported that in calm weather and smooth sea, the breakwater is entirely covered on the highest tides and gives no indication of its presence by rips or otherwise.

Some shelter from southerly winds is afforded by the breakwater. A swell makes in during southeast winds, and vessels should not attempt to ride out a gale from that direction in Bar Harbor. The usual anchorage is southward and southeastward of the eastern end of Bar Island in depths of 6 to 78 feet, the depths shoaling rapidly toward the bar southward of Bar Island. The southern limit of the anchorage is marked by white barrel buoys placed by the harbormaster to leave a clear channel to the wharves. Large vessels sometimes anchor northward or northwestward of Bar Island, in 42 to 60 feet, soft bottom. The western shore is fairly bold, with the exception of a rock, bare at low water, 0.6 mile westward of Bar Island and 250 yards from the shore at the entrance of **Duck Brook.** Vessels should keep over 0.4 mile southward of a line joining Bald Rock Ledge and Bald Rock, a bare rocky islet. The mean range of the tide is about 10.5 feet.

The town of **Bar Harbor** on the shore of Bar Harbor is an important summer resort and yachting center. It has good highway connections, and during the summer many sightseeing cruises and fishing trips are scheduled daily for the vicinity of Frenchman Bay and Mount Desert Island. There is an auto-passenger ferry service between Bar Harbor and Yarmouth, Nova Scotia, with daily sailings during the summer months, and every other day, for the remainder of the year. Bar Harbor is a **customs port of entry** and marine documents are issued. The **customs** and **immigration** offices are on the ferry pier, which is about 1 mile northwestward of the town.

Bar Harbor has a **harbormaster.** The municipal pier has a depth of 10 feet at its end, and there are floats for yachts and commercial craft on each side of it. Water is piped to the floats, and electric power is available. Other wharves have 4 to 10 feet alongside. Ten free guest moorings for yachts are at the disposal of the harbormaster. Diesel oil, gasoline, water, ice, bottled gas, food, and ship chandlery are available at the wharves.

There are facilities for only minor repairs in the town, but there is a boatyard with marine railway at Sand Point, about 4 miles northwestward where craft up to 75 feet in length and 10-foot draft can be hauled out for repairs or winter storage. There is a compass adjuster available. The town has bus, telegraph, and telephone communication.

Cromwell Cove, westward of the end of the breakwater, has an old private pier, but is seldom used, even as an anchorage.

Chart 306.—Burnt Porcupine Island is about 0.5 mile eastward of Sheep Porcupine Island. A deep clear channel to the upper part of Frenchman Bay is between the islands. Another deep channel is between **Long Porcupine Island,** 0.4 mile east of Burnt Porcupine Island, and Ironbound Island. **Rum Key** is between Burnt Porcupine and Long Porcupine Islands. **The Hop** is off the northeast side of Long Porcupine Island.

The southeast side of Mount Desert Island between Bar Harbor and Seal Harbor is rocky and precipitous. The small coves indenting the shores are of no importance to navigation. Several dangers are off the shore, but the most dangerous either show above water or are marked by buoys.

Thrumcap Island, 1.4 miles southward of Bald Porcupine Island, is a round, rocky island with a clump of trees in its center. It is reported that there are downdraft wind currents around Thrumcap Island, and accordingly, small sailboats should keep offshore.

Caution.—An 8-foot spot is 0.2 mile north-northwest from Thrumcap Island. It is unmarked and has been struck by several yachts navigating along the coast at this point.

Newport Ledge is 400 yards from shore, midway between the Thrumcap and Schooner Head. The ledge is bare at extreme low water; a buoy is on its eastern side. The bottom west of the ledge is broken and should not be crossed by vessels.

Schooner Head, 1.2 miles south of Thrumcap Island, and **Great Head,** 2.1 miles southward of the island, are prominent rocky headlands on the eastern side of Mount Desert Island. On the summit of the eastern hill at Great Head, the ruin of a small round flat-topped stone

building is conspicuous. Numerous boulders lie awash between the two headlands.

Old Whale Ledge (Schooner Ledge), 350 yards from shore, midway between Schooner Head and Great Head, is bare 4 feet at low water. A lighted bell buoy is 300 yards eastward of the ledge.

Newport Cove, a small cove westward of Great Head, is exposed southward, has poor holding ground, and is never used as an anchorage. A bare rock is off the entrance. Because of a prominent sand beach at the head of the cove, the area is known locally as **The Sand Beach.**

Otter Cliff Ledge, bare at half tide, is 400 yards eastward of **Otter Point**, 1.5 miles southward of Great Head. A bell buoy is eastward of the ledge.

Otter Cove, a long cove making northward of the west side of Otter Point, has deep water in the entrance and is bare for 0.4 mile from the head. The cove is exposed southward, but is used by local fishermen who lay to moorings. A causeway and fixed bridge cross the cove 0.7 mile above the entrance.

Chart 206.—Southwest Harbor, Somes Sound, Northeast Harbor, Seal Harbor, and several other coves are in the southeast side of Mount Desert Island, inside a large group of islands and shoals. These waters are the approaches to several important villages and summer resorts, and are frequented by many pleasure craft and fishing boats. Southwest Harbor is used also extensively as a harbor of refuge. The harbors can be approached through the channels on either side of Sutton Island or through Western Way.

Baker Island, 3.7 miles south of Otter Point and the most southeasterly of the group of islands in the vicinity, is mostly wooded, but grassy on its northwest end. There are several houses on the island. **Baker Island Light (44°14.5′ N., 68°12.0′ W.)**, 105 feet above the water and visible 16 miles, is shown from a white stone circular tower, with black lantern, in the center of the island. A whistle buoy is about 1 mile southeastward of the island. The island is surrounded by ledges, bare and submerged, and should be given a berth of at least 0.4 mile.

The Thumper is a ledge, bare at low water, 300 yards southward of the island. Another ledge, partly bare at low water, is 400 to 700 yards off the southwest side. A small Coast Guard boathouse and runway are on the northwest side of the island.

Harding Ledge, with 1 foot over it, off the east end of Little Cranberry Island, **Gilley Ledge**, with 11 feet over it, and the ledges extending northeastward and eastward of Baker Island, are all marked by buoys.

Little Cranberry Island, about 1 mile northwest of Baker Island, is low and wooded. A large white abandoned Coast Guard building with lookout tower is prominent on southeast point of the island. **Islesford** (P.O.) is a village on the west side of the island. Two wharves with float landings, each with 7 feet alongside, are in **Hadlock Cove**, a bight off Islesford. Gasoline, diesel oil, and water are available at these wharves. Some food supplies are obtainable. The ruins of an old stone wharf are close northwestward of the wharves.

The passage between Little Cranberry and Great Cranberry Islands is used at any stage of the tide by small local craft, but it has many unmarked ledges and should not be used by strangers. Small passenger and mail boats maintain service between the Cranberry islands and Southwest Harbor the year around, and between the islands and Seal Harbor during the summer months.

Cranberry Harbor, southward of Sutton Island and between Little Cranberry and Great Cranberry Islands, is frequented by small local vessels. Sometimes small coasting vessels anchor in the harbor, but Southwest Harbor offers much better anchorage. The usual anchorage in Cranberry Harbor is in depths of 14 to 20 feet in the middle of the harbor with the wharves at Islesford bearing about 050°. Care must be taken to keep well clear of the buoy on the end of the ledge which extends 350 yards westward from the east side at the entrance.

The Pool is a large shallow cove on the east side of Great Cranberry Island southwest of Cranberry Harbor. A rock awash is nearly in the midentrance. Several small wharves, dry at low water, are in the pool. There are two boatyards, one active, which can build or haul out for repairs craft up to 45 feet in length and 8 feet in draft. Open and covered storage for from 45 to 60 boats is available at the two boatyards.

Great Cranberry Island, about 2 miles west of Baker Island, is wooded and has no prominent marks visible from southward. **Cranberry Isles** (P.O.) is a village on the island. **Spurling Cove**, on the north side of the island, has a town wharf 280 feet long, with float landing and about 50 yards southeastward a 300-foot commercial wharf, also with float landing. There is reported to be a depth of 8 feet alongside both float landings. Gasoline, diesel oil and water are available at the commercial wharf. **Long Point** is the northeast end of the island. **Crow Island**, northeast of Deadman Point, the southeast point of Great Cranberry Island, is low and grassy with prominent reefs to the east and southeast.

Chart 306.—South Bunker Ledge, 0.7 mile southwest of Great Cranberry Island and in the southern approach to Western Way, is bare 4 feet at low water. A daybeacon is on the ledge.

Long Ledge is a dangerous reef extending 0.5 mile southeastward from Mount Desert Island, on the western side of the southern approach to Western Way. The ledge is mostly bare at low water and has a few rocks which bare at high water. A lighted gong buoy is off the southeastern side.

Chart 206.—Western Way, between the western side of Great Cranberry Island and Mount Desert Island, is a passage frequently used by vessels bound to Southwest Harbor and vicinity. Also, small vessels bound between

points westward and any point in Frenchman Bay use it, except in rough weather. The channel is buoyed, and the least depth is 13 feet on a bar at the northern end, but there are unmarked spots of 10 to 12 feet close to the sailing lines. The passage should not be used by strangers in craft drawing more than 10 feet.

Cranberry Island Ledge, with a least depth of 9 feet near its southwestern end, about 500 yards from the southwestern end of Great Cranberry Island, and with lesser depths closer to shore, is marked by a buoy. **Flynns Ledge,** with a least depth of 2 feet, extends about 0.5 mile southeastward from Seawall Point, where it is marked by a buoy.

Southwest Harbor, an important harbor in the south side of Mount Desert Island, is the approach to the villages of Southwest Harbor and Manset. The harbor affords an excellent, well-sheltered anchorage and can be entered from the eastward by deep-draft vessels. A small islet, about 400 yards from the head of Southwest Harbor, is marked by a daybeacon.

Greening Island, on the north side of the entrance to the harbor, is low and wooded. Several houses are visible on the island and a large house at the eastern end is prominent. Shoals which border the island on all sides are marked on the northern, southeastern, and southwestern ends by buoys. Several private piers with float landings are on Greening Island, and three private boathouses with marine ways are conspicuous.

The well-marked channel approaching Southwest Harbor northward of Sutton Island is deep and has been examined by means of a wire drag. This passage is used by all vessels entering Southwest Harbor from the northward in Frenchman Bay and by most vessels entering from the eastward and southeastward.

The channel southward of Sutton Island, **Gilley Thorofare,** has unmarked rocks with least found depths of 16 and 17 feet. **Spurling Rock,** with a depth of 7 feet, on the south side of the channel, about 0.3 mile off the northeastern end of Great Cranberry Island, is marked by a buoy. This passage has been examined by means of a wire drag. With the aid of the chart it is easy to navigate in the daytime.

Excellent, sheltered anchorage may be found in Southwest Harbor in depths of 12 to 54 feet. Deep-draft vessels can anchor midway between Greening Island and the southern shore in depths of 34 to 54 feet. Smaller vessels can anchor farther in the harbor, the depths shoal gradually to 12 feet at a point 150 yards eastward of the islet near the head of the harbor.

Vessels approaching Southwest Harbor from any direction in good weather should experience no trouble, with strict attention to the chart and following the aids.

Normally navigation in Southwest Harbor and approaches is not restricted by ice. In very severe winters ice is reported to have formed as far out as the Cranberry Islands, but is carried to sea at the first ebb tide by the current out of Somes Sound.

A pilot is not required if entering from eastward in daytime with clear weather. Strangers coming from westward and crossing Bass Harbor Bar and Cranberry Island Bar (Western Way) usually can obtain a pilot at Bass Harbor if desired.

The village of **Southwest Harbor** (P.O.) is on the north side and at the head of the harbor. Customs are handled by an officer from Bar Harbor. The Coast Guard Wharf on **Clark Point** has a depth of 15 feet alongside. See Appendix for **storm warning** displays.

The town wharf and ferry landing has three floats, at which there is reported to be a depth of 15 feet at the outer end. There are other commercial and private wharves, some with float landings, with depths of 4 to 15 feet alongside. Gasoline, diesel oil, water, bottled gas, and ship chandlery are obtainable. The **harbormaster** supervises the mooring in the anchorages.

A boatyard can build craft up to 100 feet in length and can haul out for repairs or storage, on the marine railway, craft of the same length and 12-foot draft. The yard also has a crane with a capacity of over 25 tons. Hull, engine, electrical and electronic repairs can be made. A large cannery, wharf, and pier, with a depth of 5 feet at the head, is at the head of the harbor.

Manset, on the south side of the harbor, has a boatyard which builds yachts and other craft up to 100 feet in length and has a marine railway capable of hauling out craft of similar length and 9-foot draft. Covered boatsheds provide winter storage for a considerable number of yachts. It has a pier with float landing with 10 feet of water at the end.

Close westward is a 300-foot pier and float landing with 8 feet alongside and a boatshed for winter storage. The town wharf with float landing has 5 feet alongside. A large fish wharf has 12 feet alongside. Gasoline, diesel oil, water, ice, provisions, and marine supplies are obtainable. There are a number of private piers with float landings to the westward.

The passage between Greening Island and Clark Point has a least found depth of 14 feet and is extensively used. A daybeacon is on the west side of the channel off Clark Point. The best water from the southward leads 100 to 150 yards westward of the buoy off the southwestern end of Greening Island and 100 yards eastward of the daybeacon.

Somes Sound is a narrow body of water, about 4.5 miles long and 0.2 mile wide, making into the south shore of Mount Desert Island. The sound is between steep, rocky shores, and has a narrow entrance with few dangers. **Middle Rock,** with a depth of 9 feet, on the west side of the entrance to **The Narrows,** is marked by a buoy on its northeast side. Greening Island is in the middle of the approach, with a channel on each side of it. With the aid of the chart good anchorage can be selected in the sound in 54 to 72 feet. Small sailing vessels should be prepared for down-draft winds from the hills.

Norwood Cove, on the west side of the entrance to Somes Sound, is not navigable, and has a causeway and footbridge across its entrance. **Jesuit Spring,** where the first settlers in 1613 obtained their water, is still free

flowing; it is on the north side of **Fernald Cove,** about 200 yards inside **Fernald Point.**

Several private float landings are on the east side of the sound above **Manchester Point,** 0.7 mile north of Greening Island.

Chart 306.—Hall Quarry (P.O.) is a small settlement on the west side of Somes Sound 3 miles above the entrance. The quarry was operating periodically during 1958. **Somes Harbor** is a small cove at the head of Somes Sound. The entrance is narrow and is marked by buoys. The Mount Desert Yacht Club is in the cove. There is a town pier and float landing with 3 feet alongside. Three guest moorings are available. Several other float landings for pleasure craft are in the harbor.

Mount Desert (Somesville) (P.O.) is a village on the west side of Somes Harbor. A church spire in the village is conspicuous. A boatyard in the northeast corner of the sound can haul out, build or repair craft up to 60 feet in length and 7 feet in draft. It has covered storage, a repair shop, marine railway, and a 3-ton crane. Gasoline and water are available.

Chart 206.—Gilpatrick Cove, on the east side of the entrance to Somes Sound, is small and shoal, and the upper end dries at low water. A fixed wooden footbridge across the entrance has a clearance of 4 feet. A pier and float landing of the Northeast Fleet Yacht Club is on the east side of the entrance. Many small yachts moor off the entrance to the cove in summertime. A wharf, about 0.3 mile northwestward of Gilpatrick Cove, has 3 feet alongside and its shed is used for coal storage; there are also oil storage tanks on this pier.

Gilpatrick Ledge, just east of the entrance to the cove, consists of several ledges. Three daybeacons are on the ledges. Vessels should keep south of the daybeacons.

Northeast Harbor, 0.6 mile eastward of Gilpatrick Cove, is 300 yards wide at its entrance and extends into the south shore of Mount Desert Island about 0.8 mile. The harbor is an important yachting center, and there are two large summer hotels on the shores. The upper part of the harbor is shoal, but anchorage for very small vessels is available in depths of 18 to 24 feet in the lower part of the harbor. This anchorage is about 200 yards wide and favors the western shore. In the inner harbor, a Federal project provides for a channel 10 feet deep to the town wharf and two anchorage areas 7 feet deep. In 1957, project depths were obtained.

In the middle of the entrance to Northeast Harbor is a rock bare at low water. A buoy is on each side of the rock. The best passage into the harbor is westward of the rock. In average winters the harbor is reported to be clear of ice except at its head, but in severe winters it is reported to freeze as far out as Bear Island.

The summer resort of **Northeast Harbor** is on the western shore of the harbor.

A dike has been constructed across the mouth of the cove in the southwestern part of the harbor, and the area behind it backfilled from material dredged from the anchorage. A town wharf and marina have been constructed on the outer face of the dike, with float landings and five finger floats for berthing yachts. There is also a wharf for commercial fishing boats. All have depths of 7 to 10 feet alongside. Water is piped to the wharf, and electric power is included in the wharfage. Telephones, washrooms, showers, and laundry machines are available at the town wharf. Gasoline and diesel oil can be obtained; ice, provisions, and yacht supplies are available. A boatyard with shed and a 3-ton crane is adjacent to the town wharf. Craft up to 5 feet in draft can be lifted out for repairs. There are many private piers with float landings about the harbor. The **harbormaster** supervises the town wharf and the anchorage.

The **Clifton Dock** is on the west side of the harbor entrance. It is reported to have 25 feet at its float landing. Gasoline, diesel oil, water, food, ice and some ship chandlery are available at the wharf.

Bear Island, on the eastern side of the entrance to Northeast Harbor, is high and wooded. **Bear Island Light (44°17.0′ N., 68°16.2′ W.),** 100 feet above the water and visible 13 miles, is shown from a white cylindrical tower on the southwestern side of the island; a fog signal is at the light. The Coast Guard wharf and shed on the northwest side is in disrepair. A Coast Guard boat shed and ways is adjacent to the south of the wharf. A private pier with float landing is on the north side of the island. The passage north of the island is almost blocked by rocky ledges and should not be attempted without local knowledge.

Sutton Island, about 1 mile long and wooded, is in the middle of the passage, **Eastern Way,** between the south shore of Mount Desert Island and Cranberry Islands. The channel north of Sutton Island has a depth of 40 feet near the center and depths of 31 and 36 feet near its northern and southern edges, respectively, and is generally used.

On the northern side of this channel opposite Sutton Island and eastward of Bear Island are **Long Pond Shoal** with a least depth of 5 feet, and **Bowden Ledge,** with a depth of 2 feet. Buoys are south of these dangers.

Sutton, a summer resort, is on the western part of Sutton Island. There are several piers with float landings on the island, including a town wharf on the western side. The approach to the town wharf, near Fernald Point, leads between two rock ledges; therefore, care should be exercised in approaching it.

Bracy Cove, 0.5 mile eastward of Bear Island, is exposed to southeast winds, has a rocky and uneven bottom, and is unfit for anchorage. There is a private pier with float landing, on the east side of the cove.

Seal Harbor makes into the south shore of Mount Desert Island about 1 mile east of Bear Island. Anchorage for small vessels may be had in the middle of the harbor in depths of 16 to 18 feet. This anchorage, about 400 yards in diameter, is exposed to southeasterly winds. The approach is between the buoy off Bowden Ledge on the west and a lighted bell buoy on the east. A ledge extends halfway across the entrance from Crowninshield

Point, the western entrance point. A buoy is off the eastern side of the ledge. The head of harbor must be given a berth of over 300 yards.

The village of **Seal Harbor** (P.O.), on the shore of the harbor, has a large hotel and numerous summer residences. The town wharf has a float landing with 9 feet alongside. Gasoline, water, and restrooms are available at the town wharf. Seal Harbor Yacht Club has a pier and float landing, close northward of the town wharf. The town has a **harbormaster.** The former coal wharf on the west side of the harbor is now privately owned and has facilities for hauling out and storing yachts. A compass adjustor is available.

East Bunker Ledge, 1 mile eastward of Sutton Island, is 0.3 mile long and has two sections bare at high water. A white, square, stone daybeacon is near its southwestern end. A buoy is north of **Lewis Rock,** a submerged danger with a depth of 6 feet, 200 yards northwestward of the ledge. A lighted gong buoy is about 0.5 mile southeastward of the ledge.

Chart 308.—Of the many islands off the entrance to Blue Hill Bay, those southward of Bass Harbor Bar and Casco Passage, and westward from Duck Islands to Swans and Marshall Islands are discussed in this chapter. The islands in this area are in general wooded and have few conspicuous marks. The only ones having settlements are Swans, Long, and Great Gott Islands. The area is very broken and rocky, and has numerous bare and submerged ledges, many of them unmarked. The through route by way of Casco Passage and Bass Harbor Bar is used by many vessels, while the passages through the islands southward are seldom used except by local fishermen and yachtsmen.

Great Duck Island, about 5 miles south of Great Cranberry Island, is the most southeasterly of the islands off Blue Hill Bay. The island is partly wooded, and from a distance eastward or westward appears as two islands. The light at the south end of the island and the buildings around it are prominent. **Great Duck Island Light (44°08.5′ N., 68°14.8′ W.),** 67 feet above the water and visible 14 miles, is shown from a white cylindrical tower on the south end of the island; a fog signal is at the light.

Little Duck Island, 0.7 mile northward of Great Duck Island, is partly wooded and has no distinguishing marks.

The Drums, a dangerous ledge 2.5 miles west of Great Duck Island and 2 miles northeastward of Long Island, is bare at low water. A bell buoy is at the southeast end of the ledge. The range formed by the western ends of Green and Placentia Islands leads well westward of this ledge.

Horseshoe Ledge, 1 mile north of The Drums, is bare at low water. A daybeacon is on the ledge.

Green Islands, 4 miles northwestward of Great Duck Island Light and 0.7 mile southward of Black Island, are two rocky islets with grass on top.

Black Island, 4.5 miles northwestward of Great Duck Island Light, is wooded. Three ledges are off the east side of the island; **Inner Dawes Ledge,** bare at high water; **Outer Dawes Ledge,** awash at high water; and **Grindstone Ledge,** bare at about half tide. A daybeacon is on Grindstone Ledge. An unmarked shoal with a cleared depth of 11 feet lies about 500 yards southeastward of the daybeacon. **Little Black Island,** off the southwest side of Black Island, is wooded in the center.

Placentia Island, 0.4 mile northwest of Black Island, is wooded except on its eastern end which is grassy. Two houses are visible on the slope of the hill on the northeastern extremity.

Little Gott and Great Gott Islands, 0.4 and 1 mile northeastward of Black Island, are mostly wooded. **Gott Island** is a small settlement on the west side of Great Gott Island. The approach to the settlement is by the passage between Little Gott and Great Gott Islands. This passage can be entered from southward at low water; but a bar, bare at low water, obstructs the passage at the northwest end. The houses of the settlement are the most prominent marks in this vicinity. There are no wharves.

Bass Harbor Bar and Bass Harbor, northward of Great Gott Island, are described later in this chapter.

Staple Ledge, between Placentia Island and the northeast end of Swans Island, is bare at low water only. A buoy is off the northeast side of the ledge.

Long Island, 4.3 miles west-southwestward of Great Duck Island, is the most southerly of the large islands off Blue Hill Bay. The island is wooded and has no conspicuous marks visible from seaward.

Lunt Harbor is a cove in the north side of Long Island. **Frenchboro** (P.O.) is a village of fishermen on the shore of the cove. The cove has good holding ground and is used as an anchorage by local boats, but it is somewhat exposed in northeasterly weather. Ice seldom interferes with navigation. A crib wharf on the northeast side of the harbor has a depth of 6 to 7 feet alongside. A large fish packing wharf has a depth of 1 to 2 feet alongside. The other wharves are bare before low water. Gasoline and provisions are available. Mail comes by small boat from Swans Island. A new mail, passenger, and auto ferry service is to be instituted between McKinley (Bass Harbor) and Frenchboro, via Swans Island early in 1960.

Northward of Long Island are numerous small islands and ledges. **Harbor Island,** just off Lunt Harbor, is wooded, and a reef bare at low water extends west of the island. A bell buoy is off a 12-foot spot 600 yards west of the island. **Crow Island,** 0.4 mile north of Long Island, is wooded except at its eastern end which is bare rock. **Dry Money Ledge,** 400 yards west of Crow Island, is a white rock islet about 10 feet high. **Sunken Money Ledge,** 400 yards southwest of Dry Money Ledge, is bare at low water. **Northeast Ledge,** 0.5 mile northeast of Long Island, has a depth of 13 feet. **Crow Island Ledge,** 0.3 mile north of Crow Island, has a depth of 9 feet. A fairway lighted gong buoy is northward of Northeast Ledge and eastward of Crow Island Ledge. **Beaumont Ledge,** 0.5 mile north of Crow Island, has a depth of 7 feet. **Otter Ledge,** about 0.8 mile north of Crow Island, is awash at low water.

Sister Islands, 0.5 mile northwestward of Crow Island,

are two wooded islands. **Sister Ledge,** awash at low water, extends 300 yards southward of the westerly of the Sister Islands. **Ram Island,** 0.5 mile north of Sister Islands and 0.2 mile off Swans Island, is marked by a single tree.

A 12-foot spot is 450 yards off **East Point,** the eastern extremity of Swans Island, and 950 yards northeastward of Ram Island.

Westward of Long Island is a deep passage. **Beach Ledge,** about 0.4 mile westward of Long Island, has a depth of 14 feet. A bell buoy is west of the ledge. **John Island,** 1.1 mile west of Long Island, is grassy and has many dead, and a few scrub trees. **John Island Dry Ledge,** 0.5 mile southwest of John Island, is 0.2 mile in diameter and has rocks showing at high water. **John Island Sunken Ledge,** 0.6 mile south of John Island, has a depth of 4 feet; a buoy is south of the ledge.

The passage northward between Long and Swans Islands has deep water but there are many unmarked ledges. The best channel is between John Island and the bell buoy off Beach Ledge, thence between the westerly of the Sister Islands and Ram Island. **Red Point,** on the southeast side of Swans Island 0.4 mile west of Sister Islands, has a low bare reddish bluff. Any of the passages can be used by small craft with the aid of the chart. A 15-foot spot is midchannel between Red Point and the westernmost of the Sister Islands, and a 24-foot spot is about 0.6 mile southwestward of the same islands; both are unmarked.

Swans Island, about 2 miles northwest of Long Island, is the largest of the islands off Blue Hill Bay. The three villages with post offices on the island are Atlantic, Swans Island, and Minturn. The island has several sheltered coves, but all except Mackerel Cove and Burnt Coat Harbor are mostly foul and little used. There is no piped water supply on the island.

Mackerel Cove is a good anchorage on the north side of Swans Island south of the eastern entrance to Casco Passage. There are islets and numerous ledges in the cove, but the entrance from northward is easy of access in the daytime.

North Point, the northernmost point of Swans Island, is on the east side of the northern entrance to the cove. A buoy is off a rock, with a depth of 1 foot, northward of the point.

Crow Island, about 0.6 mile west of North Point, is on the western side of the northern entrance. A buoy is eastward of a ledge, awash at low water, 400 yards east of the island. A buoy is off a shoal, with a least depth of 11 feet, near the center of the harbor.

A narrow channel into Mackerel Cove from York Narrows follows close to the shore of Swans Island, and passes southward of Orono and Round Islands.

The common anchorage in Mackerel Cove is westward of the buoy off the 11-foot spot. Anchorage can be had between this buoy and the buoy off Crow Island in depths of 24 to 32 feet. Care must be taken to give the eastern shore a berth of 300 yards. Another good berth is between the buoy off the 11-foot spot and a bare ledge 0.3 mile southwestward. This ledge is about 0.3 mile northwestward of the wharf at Atlantic. A 4-foot spot is 0.3 mile northwest of the ledge and another 4-foot spot is 500 yards east of the ledge and off the village.

The dangers in the entrance to Mackerel Cove are buoyed and, although there are many dangers inside, it should not be difficult even for a stranger to enter and anchor safely by daylight with the aid of a chart. Enter between the buoy off North Point and the buoy off Crow Island and steer about **181°** so as to pass westward of the buoy marking the 11-foot spot.

Atlantic (P.O.) is a village on the southeast side of Mackerel Cove. The church spire and several houses are prominent from eastward. A dangerous 4-foot spot off the village must be carefully avoided. The wharves are nearly bare at low water. Gasoline and some stores are available. In 1959, auto and passenger ferry service was inaugurated between Atlantic and McKinley at Bass Harbor. The ferry slip is close southward of **Fir Point** on the east side of the cove.

Seal Cove, on the northwest side of Swans Island just south of **Buckle Island** and York Narrows, and **Toothacher Cove,** on the southwest side of Swans Island, have many unmarked dangers and are of importance only to fishermen. A shoal with a depth of 4 feet is in the middle of the approach to Toothacher Cove.

Burnt Coat Harbor is a small, well-sheltered anchorage on the southwestern side of Swans Island. The harbor is much used by fishermen and yachtsmen. **Burnt Coat Harbor Light (44°08.1′ N., 68°26.9′ W.),** 75 feet above the water and visible 14 miles, is shown from a white square tower, connected to a dwelling, on **Hockamock Head,** on the west side of the harbor entrance. A fog signal is at the light.

The anchorage, eastward of the light, is about 500 yards wide, with depths of 21 to 34 feet, soft bottom. A good anchorage for small craft is in the channel northward of the light, in depths of 13 to 24 feet. A crib wharf where mail and supplies are brought from Stonington is on the north side of **Long Cove,** on the east side of the harbor near the entrance.

Swans Island (P.O.) is a village on the west side of Burnt Coat Harbor. The wharf has a depth of 6 feet alongside; the fish wharves have less depth. Gasoline and provisions are available. In 1959 there was daily communication by boat with Stonington and Frenchboro.

Minturn (P.O.) is a small settlement on the east side of Burnt Coat Harbor. There are several fish wharves. Pilots can be obtained from among the local fishermen if desired.

Off the entrance and approach to Burn Coat Harbor are several islands and reefs. **Harbor Island,** in the middle of the entrance, is wooded except for its southwest and southeast sides. There is a house on the northeastern slope, and a pier with float landing on the north shore, eastward of the daybeacon.

Baker Islands, 0.3 mile southeast, and **Scrag Island,** 0.5 mile south, respectively, of Harbor Island, are wooded. **Green Island,** 0.3 mile southwest of Scrag Island, and **Gooseberry Island,** 0.6 mile west of Harbor Island, are bare and grassy. **Gooseberry Island Ledge,** 0.2 mile southeastward of Gooseberry Island and on the north-

western side of the approach to the harbor, is bare at low water only; a buoy is off the ledge. **High Sheriff,** bare at high water, and **Sheriff Ledge,** bare at low water, are westward of Gooseberry Island. A buoy is 0.4 mile southwestward of High Sheriff. A rocky shoal with a depth of 18 feet is 0.6 mile southwest of Gooseberry Island.

The main entrance to Burnt Coat Harbor is from the southwestward, between the daybeacon on the rock off the northwest side of Harbor Island, and Burnt Coat Harbor Light. Strangers should have no trouble entering in daytime with strict attention to the charts and by following the aids. The entrance is marked by a fairway bell buoy.

From a position about 100 yards north of the fairway bell buoy off the entrance, steer for a position midway between the light and the daybeacon. Pass south of the buoy off Gooseberry Island and favor the daybeacon slightly. Anchorage may be selected eastward or northeastward from the light, or in midchannel north of it.

The passage inside Baker Islands is available for small craft entering Burnt Coat Harbor from the eastward. It is used by local craft, but is narrow and difficult, and strangers are advised to use it only after obtaining local knowledge, and on a rising tide.

Marshall Island, 2 miles westward of Harbor Island, is the largest of the group of islands southward of the western end of Swans Island; the island is wooded. A rocky shoal with a depth of 7 feet near its end extends 0.4 mile north of Marshall Island; a buoy is off the end of the shoal.

Hat Island, 0.9 mile north of Marshall Island and just south of the western end of Swans Island, is bare on the summit and wooded elsewhere. A buoy is southwestward of **Hat Island Ledge,** which extends 0.4 mile westward of the island.

Ringtown Island, just off the northeast side of Marshall Island, is wooded. **Yellow Ledge,** southeastward of Ringtown Island, has a rock bare at high water and a considerable area bare at low water. **Brimstone Island,** 1 mile east of Marshall Island, is bare and grassy. **Heron Island,** 0.5 mile south of Brimstone Island, is grassy with trees in the middle.

Many bare and submerged rocks and ledges are southward of Brimstone and Heron Islands and southeastward of Marshall Island. Extreme caution must be used in navigating in this area as most of the dangers are not marked. Two small ledges bare at low water are between Brimstone and Heron Island.

Heron Island Point Ledge, 0.2 mile south of Heron Island, is awash at high water. **Mason Ledge,** 0.4 mile west of Heron Island, and **Black Ledge,** 1.2 miles southwest of Heron Island, are bare at high water. About 0.2 mile northeast of Black Ledge, is a depth of 6 feet. **Seal Ledge,** 0.9 mile south of Heron Island, has a least depth of 10 feet; a buoy is east of the ledge. **Cod Ledge,** 0.3 mile southwest of Mason Ledge, has a depth of 3 feet. A depth of 4 feet is 300 yards southwestward of the ledge. **Jobs Ledge,** 0.6 mile south of Marshall Island, and **Sprague Ledge,** 0.3 mile south, have depths of 9 and 7 feet, respectively, and are unmarked.

Spirit Ledge, 0.7 to 1.2 miles southwestward of Marshall Island, is in two sections. The northeastern section is bare at high water and the southwestern bares at about half tide. **Boxam Ledge,** off the southwest side of Marshall Island, is bare at low water.

These ledges, together with numerous other ledges and islands, extend across Jericho Bay and southwest across the entrance of that bay to Isle au Haut. The other ledges and islands are discussed in Chapter 7.

Jericho Bay is between Swans and Marshall Islands on the east, and Isle au Haut and Deer Isle and adjoining islands on the west. The inside routes from Casco Passage and York Narrows to Deer Island Thorofare and Merchant Row, and the passage north of Pond Island to Eggemoggin Reach, lead across the head of Jericho Bay. This section of the bay is used by many vessels.

The part of the bay southward of these thoroughfares has deep water, but there are many ledges, rocks, and islets. This area is little used except by local fishermen and yachts. The dangers in the bay are described in Chapter 7.

In approaching Jericho Bay from the southeastward, it is advisable to pass between Marshall Island and Swans Island, through Toothacher Bay where most of the dangers are marked; but then only in daytime. In clear weather, strangers should have no trouble navigating any of the passages, or through Merchant Row, or Deer Island Thorofare, by giving strict attention to the chart and following the aids, which are colored and numbered for passages to the northward and westward.

The dangers in the passages into Jericho Bay from the southward, eastward of Isle au Haut, in the channels between that island and Marshall Island, are for the most part not marked. This is the most direct way from sea from that direction. There are, however, a number of unmarked shoal spots which must be avoided.

Chart 227.—Casco Passage and **York Narrows,** northward of Swans Island and between Swans Island and Black and Johns Islands, form a part of the different inland passages between Mount Desert and Whitehead Island. The narrow passage separates into two branches in its western part. The eastern end and northern branch form Casco Passage; the southern branch is York Narrows.

Johns Island, 1.3 miles northwestward of the northern extremity of Swans Island, **Opechee,** and **Black Islands,** on the north side of the passage, and **Orono, Phinney** and **Round Islands,** on the south side of the passage, are in general, low, and wooded. They have the following distinguishing marks: Johns Island has a wooden tripod on its southwestern end; Opechee, whitewashed rocks on its southeastern end; Black Island, white washed rocks on its southeastern and southwestern extremities; and Phinney Island has a distinctive boulder on its northern end.

Buckle Island, on the south side of the western end of York Narrows, has a large area of whitewashed rocks on its northern extremity. **The Triangles,** at the eastern end

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of Casco Passage, is a bare ledge from which a reef, bare at halftide, extends 400 yards northward.

Long and Hawley Ledges, westward of Orono Island, lie between the western part of Casco Passage and York Narrows. **Egg Rock,** off the western entrance, is marked by a daybeacon on the ledge and a bell buoy southwestward of it. **Sunken Egg Rock,** with 8 feet over it, about 0.4 mile south-southwestward from Egg Rock, is marked by a buoy northward of it.

Casco Passage and York Narrows are well marked, the aids being colored and numbered for a passage westward. Little trouble should be experienced in navigating either passage by giving strict attention to the chart and following the aids.

Casco Passage is the straighter and better channel and has a depth of 13 feet for a width of about 100 yards. A rock, bare at low water, is 125 yards off the south side of Black Island, and care should be taken to avoid it. There are rocks with little depth over them on each side of the passage.

The **current** through Casco Passage floods eastward and ebbs westward. The velocity of flood or ebb is about 1 knot. The velocity is influenced greatly by strong winds. For current predictions the Tidal Current Tables should be consulted.

York Narrows has a width of not much over 100 yards, and has dangerous ledges on both sides. It is not recommended for vessels of a greater draft than 9 feet, except with local knowledge.

Chart 307.—Blue Hill Bay, west of Mount Desert Island, is about 14 miles long. In the bay are several large islands and some small ones, between which are good channels with deep water. The dangers are comparatively few; the most prominent are marked by buoys. There are numerous coves on both sides of the bay.

The head of the bay is divided into several large arms, the most important of which is Union River Bay. Blue Hill Bay forms the approach to the villages of McKinley, South Blue Hill, Blue Hill Falls, Blue Hill, East Blue Hill, Surry, and the city of Ellsworth.

The bay is frequented by a few coasting vessels, fishing craft, and yachts. Gasoline and provisions are obtainable at the villages. Repair yards for small vessels are at McKinley, Bernard, and East Blue Hill.

Tides and currents.—The mean range of tide in Blue Hill Bay is about 10 feet. The current floods northward and ebbs southward. Velocities of 2 knots have been observed near Staple Ledge Buoy 1A at the south end of the bay. Current information for locations in Blue Hill Bay and vicinity is contained in the Tidal Current Tables.

Bass Harbor Bar connects Great Gott Island with **Bass Harbor Head,** the southwestern point of Mount Desert Island. **Bass Harbor Head Light (44°13.3′ N., 68°20.3′ W.),** 56 feet above the water and visible 13 miles, is shown from a white tower, connected to a dwelling, on the head; a fog signal is at the light. A depth of about 9 feet is on the bar.

Caution should be exercised in navigating the channel which is about 300 yards southward of Bass Harbor Head Light. A fairway buoy marks the channel across the bar. The channel is on the through route used by most vessels of 9 feet draft or less, and is sometimes used by vessels drawing 18 feet proceeding at high water and with a smooth sea.

In heavy weather breakers occasionally form entirely across the bar. On the bar and off Long Ledge, with the wind contrary to the tidal current, a heavy chop builds up, which might beset small craft and open boats.

Bass Harbor, in the southwest end of Mount Desert Island just westward of Bass Harbor Head, is an important fishing port. The harbor is sometimes used as an anchorage by vessels bound through the inside passage, but the outer harbor is exposed southward. The outer harbor is clear with the exception of **Weaver Ledge,** in the middle, and bare about 2 feet at low water. A buoy is on the southeast side of the ledge and another buoy is on the northwest side.

Vessels can enter on either side of Weaver Ledge and anchor between the ledge and the entrance to the inner harbor, in depths of 30 to 46 feet, bottom soft in places.

The inner harbor is a crooked channel, 100 yards wide, with depths of 13 to 24 feet, and provides a secure anchorage for small craft. Two buoys are on the western side of the entrance. The channel inside is unmarked and there are shoals close to it on either side.

McKinley (P.O.) is a village on the east side of Bass Harbor. It has two fish canneries and is the headquarters for many fishing vessels. The stack and the twin elevated tanks of the large cannery are conspicuous, as is the spire of a church at the head of the harbor. The wharf of the large cannery has 7 feet alongside. The smaller cannery, close northward, is reported to have 10 feet alongside. Diesel oil, gasoline, water, food and some ship chandlery are available.

A boat repair yard and machine shop, about 250 yards above the upper cannery wharf, can haul out craft up to 45 feet in length and 7-foot draft for hull and engine repairs. Welding and electric repairs can also be made, and winter storage is available.

A boatworks with marine railway, wharf and covered boatshed is on the east side of the outer harbor about 400 yards south of the elevated tanks. Craft up to 80 feet in length can be built or hauled out for hull repairs. There is reported to be a depth of 12 feet at the wharf. The slip for the automobile ferry to Swans Island is close northward of this boatyard.

Bernard (P.O.) is a village on the west side of the harbor. There are two old fish cannery wharves, mostly in ruins and with little water alongside, but a commercial wharf with float landing has 5 feet alongside. Gasoline, water, and some supplies can be obtained at the wharf.

A boatworks with covered sheds, and marine ways, about 400 yards northward, can build craft up to 55 feet in length, or haul out for repairs up to 40 feet in length. It has a pier and float landing with 3 feet alongside. Covered storage is available.

Mitchell Cove, about 0.5 mile northwestward of Bass Harbor, is shoal and foul, and has no landings.

Duck Cove, about 1.5 miles northwestward, has a boat-

works with covered sheds which can build or haul out for repairs craft up to 60 feet in length and 8 feet in draft. It has two ways, and covered and open winter storage is available.

Goose Cove, on the eastern side of Blue Hill Bay 2 miles northwestward of Bass Harbor, is frequented by fishing boats. The cove has good holding ground and offers excellent anchorage for small boats, except in heavy southwesterly weather. A shoal in midharbor is marked by a buoy. **West Tremont** (P.O.) is a village at the head of the cove. A church spire at the village is prominent from seaward. There is a wharf, dry at low water, at which gasoline can be obtained, and water can be had from a nearby well.

Goose Cove Rock, 0.6 mile northwest of Goose Cove and 0.2 mile offshore, is a rocky islet with grass on top. **Rumell Island,** 0.6 mile northwestward of Goose Cove Rock, is another rocky islet with grass on top. There are fishweirs between the island and mainland. **Latty Cove** is an indentation between Goose Cove Rock and Rumell Island.

Seal Cove, 4 miles northwestward of Bass Harbor, is a sheltered anchorage for small vessels, except in westerly winds. Rocks awash at high water are about 300 yards offshore just inside **Reed Point,** the northern entrance point, and a ledge partly showing at high water is off the shoal bight just inside **Dodge Point,** on the south side of the entrance. Craft entering midway between the rock and ledge, will find anchorage near the middle of the cove, in depths of 11 to 37 feet. There is a private pier and float landing on the south side of the cove.

Moose Island, north of the entrance to Seal Cove, is grassy. A bar, bare at low water, connects the island to a point 0.3 mile northward of Reed Point. The point has a few buildings, a wharf, and a prominent flagpole with crossarm. Small craft anchor northward of the bar. A rocky ledge, awash at low water, is reported to be 125 yards north of Moose Island.

Hardwood Island, 0.7 mile northwest of Moose Island, is wooded at the north end, and grassy, with scattered trees southward. A bar extends 0.3 mile southwestward from the island; a buoy is off the end of the bar.

Sawyer Cove, on the eastern shore of Blue Hill Bay eastward from the north end of Hardwood Island, is an anchorage for small craft. A ledge awash at high water is on the north side of the cove at the entrance. Several float landings are in the cove.

Pretty Marsh Harbor makes into the eastern shore of Blue Hill Bay northeastward of Hardwood Island. There is good anchorage in depths of 32 to 37 feet, 300 to 500 yards from the eastern shore eastward of **Folly Island,** a grassy island with a few trees. The northern and western sides of the harbor are shoal inside **West Point** on the western side of the harbor 0.6 mile northeast of **Folly Island.** A shoal extends 350 yards southeastward from West Point. A shoal extends 150 yards southeastward from Folly Island, and a ledge with 3 feet over it is 200 to 300 yards eastward from the island; otherwise, there are no dangers away from the shores. Several float landings are on the east side of the harbor.

John Island, an islet 0.4 mile northward of Folly Island, and a lower islet 400 yards northwestward are grassy. **Birch Island,** 0.4 mile northwestward of John Island, is wooded.

Bartlett Island, 0.7 mile northward of Hardwood Island, is mostly wooded, and has a few houses. A pier and float landing are on the east side. A grass-covered islet is close to the northeast end of the island.

Bartlett Narrows is between Mount Desert Island and Bartlett Island. The channel is narrow, but has deep water and few dangers, and is not difficult. The midchannel westward of Folly and John Islands is clear. If passing eastward of Folly Island, give it a berth of about 400 yards, and give the south end of John Island a berth of 200 yards. The eastern shore of the narrows from West Point to its northern end is bold and should be favored. In the narrowest part keep the eastern shore close aboard, distant 100 yards, to avoid a ledge extending 200 yards southward from a group of bare rocks, southeastward of Ledges Point, on Bartlett Island.

A ledge with 2 to 3 feet over it is 400 to 600 yards from the eastern shore 0.4 mile northward of Bartlett Narrows. It will be avoided by keeping westward of a range formed by the northwest tangents of Black and Alley Islands.

Western Bay, northeastward of Bartlett Island, is a part of the waters which separate Mount Desert Island from the mainland northward. Mount Desert Narrows, described previously, is at the head of Western Bay.

Black Island, 1 mile eastward of the north end of Bartlett Island, is thickly wooded. **Green Island,** close to the southern shore of the bay, is 0.5 mile east of Black Island. **Alley Island,** the largest island in Western Bay, is 1.2 miles north of Green Island.

Vessels of any size can select anchorage in the bay southwestward of Alley Island, in depths of 44 to 64 feet; the broken ground with depths of 34 to 36 feet extending 0.4 mile off the southeast side of **Oak Point,** 1.5 mile westward of Alley Island, should be avoided. With the aid of the chart, good anchorage can be selected also in depths of 21 to 38 feet southeastward and eastward of Alley Island.

The range formed by the summit of Bartlett Island and the middle of Black Island clears the shoal extending 500 yards southeastward from Alley Island.

Foul ground extends about 500 yards from the south shore of Western Bay between Green Island and **Indian Point,** 1 mile northeastward. **Northwest Cove,** eastward of Indian Point, has an anchorage in depths of 10 to 20 feet, but a ledge with little water over it extends 500 yards from its southeast shore 600 yards eastward from Indian Point. **Clark Cove,** 1 mile northeast of Indian Point, has a wharf and landing for small boats.

Goose Cove is a large shallow bight on the north side of Western Bay above Alley Island. The village of **Trenton** is on the northern shore. The head of the cove is dry at low water for a distance of 0.5 mile and thence

it deepens gradually to 7 feet 0.5 mile farther down. There are no wharves in the cove.

Mahoney Island, on the west side of Blue Hill Bay 7.5 miles west of Bass Harbor Head and just eastward of the entrance to Eggemoggin Reach, has some scattered trees. **Smutty Nose Island,** 0.5 mile northwestward of Mahoney Island, is grassy. **Mahoney Ledge,** southwestward of Mahoney Island, is partly bare at low water. A buoy is southward of the ledge and another buoy is off the shoal water southeast of Mahoney Island.

Pond Island, 1.3 miles eastward of Mahoney Island, is wooded on its eastern side. The western side is grassy. **Lamp Islet,** 0.2 mile northward of Pond Island, is grassy.

Pond Island Passage, the channel north of Pond Island, is used by vessels entering Blue Hill Bay from westward and sometimes by vessels following the inside route eastward or westward. The passage has a least depth of 19 feet in the buoyed channel, but there are dangers close to the sailing lines. The buoys are colored and numbered for vessels bound westward.

Between Pond Island and Casco Passage, 1.5 miles southward, are several islands. Opechee, Johns, and Black Islands have been previously discussed. **Sheep Island** is grassy and **Eagle Island** is wooded. A reef bare at low water is 500 yards eastward of Eagle Island. The passages between these islands are obstructed by reefs.

Channel Rock, 1 mile northward of Pond Island, has a whitish top about 5 feet above high water. A submerged ledge extends 0.4 mile east-southeastward of the rock.

Green Island is grassy and marked by an abandoned lighthouse tower, white with dwelling, and by **Blue Hill Bay Light (44°14.9′ N., 68°29.9′ W.),** 25 feet above the water and visible 8 miles, shown from a black skeleton tower. The shoal of which Green Island is a part is bare at low water from the island to the shore 1.1 miles northwestward and for a distance of nearly 0.3 mile southward of the island.

Other islands on the shoal include **Flye, Goose,** and **Gander Islands.** A buoy is off the south end of the shoal. **Sand Islet,** 0.3 mile northeastward of the light, is bare and nearly covered at high water. A buoy is westward of the islet and a fairway bell buoy is in the channel between Green Island and Sand Islet.

Flye Island Ledge, having rocks with depths of 7 to 15 feet, extends to a point 1 mile south-southwestward of Blue Hill Bay Light.

Herrick Bay is a shallow and unimportant bight on the western side of Blue Hill Bay northwestward of Blue Hill Bay Light. **Naskeag Point,** 0.8 mile northwest of Mahoney Island, is on the western side of the approach. The bay is dry at low water for nearly 1 mile from its head. There is good anchorage in the approach to the bay 0.5 mile from the western shore northward of Naskeag Point, in depths of 24 to 45 feet. In approaching the anchorage the range formed by the western ends of Flye and Long Islands leads westward of Flye Island Ledge.

Ship, Trumpet, Bar, and **Tinker Islands** are a chain of islands 4 miles long in the middle of Blue Hill Bay, eastward of Blue Hill Bay Light. The islands are joined by shoals bare at low water, except for a channel between Trumpet and Bar Islands; the channel has a depth of 17 feet near a fairway buoy. Ship and Bar Islands are grassy, and Bar Island has three houses on the northern slope. A buoy marks the end of the shoal extending 600 yards from the northeastern side of Bar Island. Trumpet Island is low and grassy. Tinker Island, partially wooded, has a shack on its southeast end.

Ship and Barges Ledge, 0.6 mile southeastward of Ship Island, is 350 yards long and bare at half tide. The ledge is marked on each end by a daybeacon, and by a bell buoy 200 yards off the east side.

West Barge is a flat grass-topped rock 600 yards westward of Ship Island. **East Barge** is a round grassy islet on the end of the shoal extending 200 yards southward from Ship Island.

Cow and Calf Ledge, extending 0.4 mile westward and northward from Tinker Island, has several rocks with little water, and one rock bare at half tide; two buoys are off the ledge.

Allen Cove, on the west side of **Herriman Point** 3.5 miles northwestward of Blue Hill Bay Light, is used as an anchorage. The cove is open northward and the shores are foul. Vessels may anchor in the middle of the cove in depths of 12 to 30 feet.

Long Island, a large uninhabited island in Blue Hill Bay 1.5 miles west of Bartlett Island, is in general wooded with few clear sections. **Long Island Hub,** off the south end of Long Island, is conspicuous because of high trees covering it.

Sand Point is on the west shore of Blue Hill Bay 3.3 miles northward of Herriman Point. **South Blue Hill,** a village on the western side of Blue Hill Bay just south of Sand Point has a wharf with a 50-foot face which is dry at low water. This is all that remains of a former town wharf, the outer 60 yards of which were destroyed in a hurricane. The submerged ruins and foundation, extending about 200 feet out from the present wharf, remain and are dangerous at all stages of the tide. Extreme caution is necessary in approaching the area.

A private stone pier and float landing with 3 feet alongside is just north of the wharf. Fishermen obtain their fuel from oil drums brought to the wharf. The start and finish of the Annual Maine Retired Skippers Sailing Race, usually held in Blue Hill Bay on the last Monday in August, is off Sand Point.

The post office for **Blue Hill Falls** is on the coast road about 1 mile southward of Sand Point.

Salt Pond, entered 1.2 miles northwestward of Sand Point and just south of the entrance to Blue Hill Harbor, has tidal falls at the entrance. The entrance is crossed by a fixed bridge with a clearance of 7 feet. The strength and turbulence of the current is such that passage is not recommended except with local knowledge.

Blue Hill Harbor, northwestward of Long Island, is a large bight in the northwestern part of Blue Hill Bay. **Parker Point,** on the western shore of the harbor 3 miles north of Sand Point, and **Sculpin Point,** on the northern shore of the harbor 0.3 mile northeast of Parker Point,

divide the harbor into an inner and outer harbor. The village of **Blue Hill** (P.O.) is at the head of the inner harbor.

Blue Hill, a prominent rounded hill, which appears blue in the distance, and gives its name to the village, bay and area, is most conspicuous. A fire lookout tower is on the summit.

The approach to the harbor is fringed with ledges with numerous rocks and boulders, some of which are awash. On the western side these ledges extend 200 to 700 yards from the western shore of the outer harbor, and at a point 1 mile southward of Sculpin Point, they extend 0.5 mile from shore.

The northeastern end of these ledges, where they extend eastward of Parker Point, is marked by a daybeacon. There are depths of 5 and 8 feet close northward of the daybeacon.

The ledges along the northern shore of the outer harbor extend from Sculpin Point to **Woods Point,** and at **Closson Point** extend 250 yards from shore.

Sculpin Ledge, on the north side at the entrance to the inner harbor, which bares at three-quarter tide, extends about 120 yards west-southwestward of the point and is marked on its southwestern side by a buoy.

A detached shoal, about 350 yards long, locally known as the **Middle Ground,** is off the entrance to the inner harbor, southeastward of Sculpin Point. It is dangerous, with rocks nearly awash, and is marked on its eastern edge by two buoys.

Vessels may enter the inner harbor by passing on either side of the Middle Ground. The eastern channel is easier and safer, and leads eastward of the two buoys and northward of the shoal.

Caution.—It is reported that some small craft have, at or near low water, attempted to pass between the buoys marking the eastern edge of the Middle Ground. It is advisable at all times to pass east and north of both buoys when using the eastern channel.

The western channel, deep and more direct, leads between the unmarked western edge of the Middle Ground and the daybeacon eastward of Parker Point. Most powered craft use the western channel and sailing craft the eastern.

The entrance to the inner harbor has a depth of about 19 feet. It is only about 50 yards wide southward of Sculpin Point, and so narrow, that a stranger should not depend on carrying a draft of more than 12 feet at low water. Craft entering should pass not more than 20 yards southward of the buoy off Sculpin Ledge before rounding up into the inner harbor.

The channel in the inner harbor is narrow and crooked. Many of the rocks in the inner harbor show except at high water and buoys are off the principal dangers.

Triangles are three rocks, bare at low water only northward of Parker Point; a buoy is off the rocks.

The upper part of the inner harbor is divided into two arms by **Peters Point;** both of the arms are shoal and foul at the heads. The western arm is used by local fishing craft, and coasting cruise schooners usually anchor off a wharf with float landing on the southwestern tip of the point. There is a depth of 12 feet at the float and water is piped to it.

Anchorage.—Anchorage sheltered from northerly and westerly winds will be found in the outer harbor in depths of from 23 to 47 feet.

In the inner harbor anchorage in depths of 12 to 28 feet, soft bottom, is available in midchannel from 200 to 600 yards above Sculpin Point off the yacht club and in the western arm in 19 to 24 feet southward of Peters Point. There are numerous private moorings in the harbor, most under supervision of the harbormaster; when unoccupied they are usually unlighted at night, and care should be taken to avoid them.

Blue Hill (Kollegewidgwok) Yacht Club is on the east side of the inner harbor, about 700 yards northwestward of Sculpin Point. There is a depth of 8 feet at the club float landing, and water and gasoline are piped to it. Rest rooms are available, and the club maintains two guest moorings.

An old stone quarry pier about 150 yards northwestward of the yacht club has 3 feet alongside, but is seldom used except by local fishermen to unload at high water.

The village of **Blue Hill** has a hospital, churches, restaurants, lodging, and telephone communication. Food, water, ice, bottled gas, hardware, and ship chandlery are available. Diesel oil can be supplied at the landings from tank truck.

In severe winters, ice usually closes the harbor from December to April, but during mild winters, it is reported to be comparatively free of ice.

Darling Island, covered with bushes, is just eastward of the entrance to Blue Hill Harbor. **Darling Ledge,** the top of which shows at low water, extends 0.3 mile southward of the island. The ground is foul between the ledge and the shore. A buoy is on the southeast side of the ledge. There is a granite wharf with float landing, now used for pleasure craft, on the mainland westward of Darling Island.

McHeard Cove is 0.7 mile north of Darling Island. Mink Island and a reef bare at high water are in the center of the cove. A crib wharf, nearly bare at low water, is at **East Blue Hill** (P.O.), a village at the head of the cove. A church spire is prominent, as are several large homes on the slope of the hill, on the east side of the cove.

A boatyard, with marine railway, in the cove, can build craft up to 75 feet in length, and can haul out vessels up to 110 feet in length and 10-foot draft. Hull, engine and electrical repairs can be made, and the yard has a 2-ton crane. Open and covered storage is available. Gas and water are obtainable at the yard or at the fish wharf close southward. Diesel oil can be obtained by tank truck. Both the yard wharf and the fish wharf are dry at low water.

Morgan Bay, northeastward of Long Island and on the west side of **Newbury Neck,** is about 3 miles long. The bay is seldom used by yachts, as there are no landings in it.

The entrance to Morgan Bay is obstructed by **Jed Islands** and the surrounding ledges, leaving a deep, nar-

row channel close to the western shore on either side of Conary Nub. **Conary Nub,** 0.2 mile off the western shore at the entrance, is a rock with a clump of scrub. **Seal Ledge,** 0.3 mile northeast of Conary Nub, is awash at high water. **Black Rock,** bare 3 feet at low tide, is on a shoal with depths of 7 to 10 feet extending 0.4 mile northeastward of Seal Ledge. **Bird Rock,** westward of Jed Islands, is about 3 feet high. **South Ledge,** 0.2 mile southward of Jed Islands, is covered at half flood. A rock with a depth of 4 feet over it is 0.2 mile southwestward of South Ledge; a buoy is west of the rock. Danger will be avoided by keeping westward of a line from Conary Nub to the southwest end of Newbury Neck.

To enter Morgan Bay, using the chart as a guide, pass westward of the buoy marking the 4-foot shoal, southwestward of South Ledge; then in midchannel westward of Conary Nub, keeping about 200 yards off the western shore, until abreast of Seal Ledge. Good anchorage can be selected in the bay in depths of from 8 to 36 feet. It is not advisable to use the channel eastward of Conary Nub without local knowledge.

Webber Cove, on the west side of Morgan Bay, about 1.3 miles above Conary Nub, is used as an anchorage by small craft. There is a private boatshed and marine railway at the cove.

Union River Bay, at the head of Blue Hill Bay, is large and extends about 5 miles in a northerly direction between Oak Point on the east and Newbury Neck on the west. The bay is free from dangers, except near its northern end. The head of the bay is separated into two arms; Union River, the eastern arm, leads to the city of Ellsworth; and Patten Bay, the western arm, leads to the town of Surry.

Patten Bay is a long, narrow arm making northwestward from Union River Bay. The town of **Surry** (P.O.) is at its head. The deepest draft entering is 10 feet, but the channel up to the town bares at low water. Good anchorage is at the entrance near midchannel, and as far as 1.5 miles above the entrance, in depths of 20 to 38 feet. A ledge partly bare at half tide extends 400 yards from the northern shore 0.7 mile westward of Weymouth Point, the head of Union River Bay. A buoy is south of the ledge. Between this buoy and a point 1 mile above, the northern shore of Patten Bay is fairly bold, while the opposite shore should be given a berth of 300 yards. Ice closes the upper end of the bay during January, February, and March. About 1 mile westward at Weymouth Point there is a pier and float landing. Gasoline and fresh water are piped to the float. A wharf, bare at low water, at the town of Surrey is in ruins.

Union River empties into the head of Union River Bay from northward and forms the approach to the city of Ellsworth, 4 miles above the entrance. The river is about a mile wide at the entrance but contracts to 100 yards 1.3 miles above. In August 1955 the controlling depth was 3.5 feet to Ellsworth, but in August 1958, it was reported locally that the channel had silted up so as to make passage impossible, even for small boats, at or near low water. Freshets occur in the spring occasionally. Ice usually closes the river from December to April.

Mill Cove, on the eastern side of Union River at the entrance, is small and shoal. Off the entrance are several rocks, the most prominent of which are buoyed. **Tupper Ledge,** with a rock baring at low water and from which broken bottom extends northward, is off the river entrance. A buoy is off the west side and another buoy is off the southeast side of the ledge. **Lord Rock,** with 9 feet over it, is close to the eastern shore off the entrance. A buoy is on the west side of the rock.

The channel in Union River is narrow and difficult. Strangers should not enter without a pilot. **Pilotage** is not compulsory, but pilots can be obtained from among local boatmen if desired. With the aid of the chart, small craft should be able to go up to Ellsworth, but should do so only on a rising tide.

The channel is marked by two buoys and a daybeacon for a mile above the entrance. From this point to the entrance to the dredged channel 1 mile below Ellsworth there are no marks, and a general midchannel course is best, although in the bend just before reaching the dredged channel the best water slightly favors the east side. The dredged channel in the upper end does not follow a midchannel course. Three buoys are on the western side of the channel. The chart is the guide.

Ellsworth (P.O.) is a city at the head of navigation on Union River. The city has a hospital and is on the main coastal highway. It has a railroad freight terminal and some industry in the manufacture of yarn, wooden toys, furniture, and sporting goods. The canning of blueberries and clams is carried on in season. There is no shipping. Fuel is transported by truck from Bangor or by pipeline. It has telephone and telegraph communication. There is one wharf, where diesel oil, gasoline, and water may be obtained, which is dry at low water. The old wharves are in ruins. The sheds of a former boatyard, on the east bank of the river, about 0.5 mile below the bridge, are now used for storage and a wood-working plant. The river is fresh at low water.

Charts 307, 308.—Routes for entering Blue Hill Bay.—Blue Hill Bay is approached from eastward across Bass Harbor Bar, from southward between Placentia Island and Swans Island, and from westward through Jericho Bay, which is entered through Merchants Row, Deer Island Thorofare, or Eggemoggin Reach. The channels between Blue Hill and Jericho Bays are Casco Passage, York Narrows, and the passage northward of Pond Island. These approaches are more or less obstructed by islands and ledges, but are sufficiently marked to be safely navigated in clear weather. At high water small boats can also enter the head of Blue Hill Bay from Frenchman Bay through Mount Desert Narrows, which has been previously described.

The inside route across Bass Harbor Bar and through Casco Passage, used most frequently by small craft of 9-foot draft or less, leads across the south end of Blue Hill Bay. Small craft bound to points in Blue Hill Bay seldom exceed 9 feet in draft, and usually follow the

inside passage. In general, they enter from eastward across Bass Harbor Bar, and from westward by the passage between Pond Island and Blue Hill Bay Light.

Vessels of drafts too deep for that route can enter the bay southward of Little Gott and Placentia Islands and northward of Black Island, but this passage is not recommended for drafts greater than 15 feet. This passage also is desirable for vessels of 9-foot draft or less when there is too much easterly or southeasterly swell on Bass Harbor Bar.

Vessels of the deepest draft can enter by the main channel between Black and Placentia Islands on the east, and Long and Swans Islands on the west.

Above the entrance, Blue Hill Bay is deep and generally free from dangers, and several channels are available.

Vessels bound from Bass Harbor Bar to Union River usually use the channel between Tinker and Hardwood Islands, and between Long and Bartlett Islands. This channel is deep and unobstructed, and the chart and buoys are the guides. Small craft sometimes use the more protected passage between Moose and Hardwood Islands and through Bartlett Narrows.

Bound to Blue Hill Harbor from Bass Harbor Bar, the most direct route leads eastward of the chain of islands and reefs extending from Ship and Barges Ledges to Tinker Island, and southward and westward of Long Island. This passage is deep and clear, and the chart is the guide.

Entering between Black and Placentia Islands, this passage has a rock with a cleared depth of 16 feet, about 250 yards off the southwest end of Little Gott Island, and a rock with a cleared depth of 13 feet, about 350 yards off the southeastern side of Placentia Island. Vessels of 15-foot draft, or less, may use it by favoring the north shore of Black Island, 250 yards off, after passing Inner Dawes Ledge, a rock islet, and round the north end of Black Island at a distance of 200 yards. Then steer west-southwestward and round the southwestern end of Placentia Island at a distance of 400 to 500 yards. The course then can be shaped northward into Blue Hill Bay, or if bound to Casco Passage, north-northwestward to pass northeastward of the buoys off Staple Ledge and North Point of Swans Island.

The preceding paragraphs describing the area give the simplest directions, by pointing out the islands, dangers, prominent features and landmarks, and where necessary, the need for local knowledge. The navigator should have no difficulty in entering the bay from any direction, in daytime and clear weather. The chart must be carefully followed.

7. JERICHO BAY TO PENOBSCOT BAY, MAINE

Chart 309.—Between Jericho Bay and East Penobscot Bay are numerous islands. **Deer Isle,** 10 miles westward of Mount Desert Island, is the largest. Eggemoggin Reach, Deer Island Thorofare, and Merchant Row are the three principal passages between the bays. **Eggemoggin Reach,** between Deer Isle and the mainland, connects Blue Hill Bay and the head of Jericho Bay with Penobscot Bay near its head. The reach is 11 miles long and has a least width of about 0.4 mile at Byard Point. There are several villages along its shores.

The eastern entrance to Eggemoggin Reach is well marked by **Devils Head,** a prominent, high rocky bluff on the south end of **Hog Island,** 2.8 miles west of Pond Island. Off the western entrance are **Cape Rosier,** high and thickly wooded; a light on Green Ledge, 1.3 miles south of Cape Rosier; and an abandoned lighthouse tower on **Pumpkin Island,** 3.6 miles east of Cape Rosier.

The depth in the main channel through Eggemoggin Reach is sufficient for deep-draft vessels, but the channel is narrow and the bottom is irregular in places. The principal dangers are buoyed and can be easily avoided in the daytime and in clear weather. An unmarked rocky shoal, with 27 feet over it, lies about 250 yards southeastward of the north tower of the Deer Isle-Sedgwick Bridge.

Vessels can anchor anywhere in the reach where the depth is suitable and the bottom soft, making a lee of either shore, according to the wind. Small craft anchor in the coves off the reach. The mean range of tide is about 10 feet.

Devils Head Ledge, extending 0.3 mile southeastward from Devils Head at the eastern end of Eggemoggin Reach, is partly bare at high water; a buoy is off the end of the ledge. **Hay Island Ledge,** 0.5 mile southeastward of Devils Head, has a depth of 7 feet; a buoy is off its southern side.

Channel Rock, 900 yards south of Devils Head, is bare at extreme low water and marked by a buoy. **The Boulders,** 400 yards northwestward of Channel Rock, are bare at low water. A fairway bell buoy is off the eastern entrance between Devils Head Ledge and Hay Island Ledge on the north and Channel Rock and The Boulders on the south.

Greenlaw Cove, on the southwest side of the eastern entrance to Eggemoggin Reach, has a narrow unmarked channel with shoals on both sides, and is suitable only for small craft with local knowledge. **Mountainville** is a village near the head of the cove. The landing is nearly bare at low water.

White, Bear, and **Conary Islands** are off the entrance to Greenlaw Cove and on the southern side of the passage through Eggemoggin Reach. **Conary Ledge,** 0.4 mile north of Conary Island, is awash at low water. A buoy is north of the ledge.

Naskeag Harbor is north of Hog Island and **Harbor Island,** which is 0.3 mile east of Hog Island. The village of **Naskeag** is on the north side. The harbor can be entered from eastward or westward, but there are many unmarked dangers and strangers should not attempt to enter except in small craft.

At the eastern approach to the harbor, the bar from the northern shore extends two-thirds of the way across. Between the end of this bar and Harbor Island is a rock bare at half tide with deep water on either side. At half tide the bar is distinguishable by ripples.

At the western entrance a submerged rock has been reported about 60 yards north of Hog Island. Between Naskaeg and Center Harbors are several private float landings.

Center Harbor, an anchorage for small craft only, is a small cove on the eastern side of the reach northeastward of **Torrey Islands,** 2.2 miles northwest of Hog Island. The town of **Brooklin** (P.O.) is at the head of the harbor. A church spire in the town is conspicuous. A rock marked by a daybeacon is in the middle of the entrance northward of **Chatto Island,** 0.6 mile northeast of Torrey Islands. The channel is close southward of the rock. Between the daybeacon and the fish factory on the north side of the cove, the channel has depths of 6 to 10 feet; above this is mostly dry at low water. Good **anchorage** is available off the entrance in depths of 22 to 24 feet, soft in places.

The main approach to Center Harbor is from westward, but local vessels enter by the channel eastward of Torrey Islands, passing in midchannel on either side of the bare rock 350 yards eastward of the easterly of the islands. This passage should not be attempted by strangers.

The fish factory wharf, in disrepair in August 1958, has 2 feet of water at the outer end. The yacht yard west of the fish pier has a marine railway and can build craft up to 35 feet in length, or haul out for repairs, or for dry, open, and covered winter storage, craft up to 18 tons, 50 feet in length, and 7-foot draft. Hull and engine repairs can be made. Food and some supplies may be obtained, and there is lodging and a good restaurant in Brooklin. The ruins of an old stone pier, covered at high water, extend about 100 feet off the yacht yard.

The Center Harbor Yacht Club pier and float landing, with 6 feet alongside, is on the north side of the entrance. Water is piped to the landing. The signal mast and clubhouse are conspicuous. There are several private

float landings in the harbor. **Anchorage** in soft mud bottom may also be had, as appropriate, south of a line between the yacht yard and the daybeacon.

Benjamin River, the approach to the town of **Sedgwick** (P.O.), makes into the eastern shore 2 miles northward of Center Harbor. The channel at the entrance, northward of **Cape Carter,** has a least depth of 19 feet, but is restricted on both sides, leaving a passage 100 yards wide at its narrowest part. A rock bare at low water is at the outer end of the ledge and sand shoal extending into the harbor from the east side 0.6 mile north of Cape Carter; it is marked by local interests in the summer. Sedgwick can be reached only at high water as the river runs dry some distance below.

On the east side of the river about 1 mile above Cape Carter, there is a yacht yard and marine railway capable of building craft up to 40 feet in length, or hauling out for repairs, or for dry, open, and covered winter storage, craft of 40 tons up to 50 feet in length and 8-foot draft. The yard has a complete machine shop, and hull and engine repairs can be made.

Water is available at the wharf; gasoline and diesel oil can be obtained from tank truck. Some supplies and provisions are available at a store in the village or at Sedgwick. The yard has a 10-ton crane lift, but the wharf dries at low water. A number of moorings are available off the yard.

The village of **West Brooklin** is near the yard. A church steeple in the village is conspicuous. A community float landing on the west side of the river about opposite the yard has 7 feet alongside. There are no facilities at the float.

North Deer Isle is a village at the north end of Deer Isle. The old ferry wharf 0.4 mile westward of **Tinker Ledges** is in ruins. There is a rock crib breakwater just east of the old wharf, and the enclosed space between the two is sometimes used for beaching local small craft. The breakwater extends about 200 feet out from shore and is covered for most of its length at high water. It is not marked and is a danger to all craft approaching close to shore.

A highway fill, extending from the northwest corner of Deer Isle to the eastern side of **Little Deer Isle,** 0.4 mile northwestward, closes this passage to all boats. **Stave Island,** just northward of the eastern end of Little Deer Isle, is wooded.

Billings Cove is on the northern shore of the reach 2.3 miles northwestward of Benjamin River and east of **Byard Point.** Anchorage can be had in the middle of the cove just inside the entrance in depths of about 25 feet. **Sargentville** (P.O.), a village near the eastern shore of the cove, has a town wharf and float landing with 8 feet alongside. An old clam factory wharf adjacent to the eastward is in disrepair. A good beach for hauling out or launching small craft is just eastward of the clam factory wharf.

The **Deer Isle-Sedgwick Bridge,** a suspension type, crosses Eggemoggin Reach between Byard Point and Little Deer Isle. The bridge has a clearance of 87 feet at the center, 85 feet for 100 feet, and 80 feet for 200 feet, respectively, each side of the center. **Howard Ledges,** about 1.4 miles westward of the bridge, are marked by a buoy on the northwestern end.

Eggemoggin is a summer resort with a float landing at the north end of Little Deer Isle, southwestward of Pumpkin Island. Several boatsheds, where small craft are hauled out for winter storage on skids, are at Eggemoggin. **Little Deer Isle** (P.O.) is a village near the south end of the bridge.

Buck Harbor, on the north side of the reach oposite Pumpkin Island, affords excellent anchorage and is often used by small vessels. **Harbor Island,** in the middle of the harbor, has a good channel around it which forms the anchorage. Shoals extend 250 yards off the northeast side of Harbor Island, and the channel is narrow between them and the shore northeastward. **Harbor Ledge,** at the north end of the shoals, is marked by a buoy. The channel between the ledge and the north end of Harbor Island has a depth of 12 feet. Small craft can anchor in the bight on the northeast side of Harbor Island. The best anchorage is west and northwestward of Harbor Island in depths of 28 to 37 feet.

South Brooksville (P.O.), a village at the head of Buck Harbor, has a stone landing with 10 feet alongside, Bucks Harbor Yacht Club float landing with 12 feet alongside, several private float landings, and a service pier with float landing, with 11 feet at the head, where gasoline, diesel oil, water, ice, and some boat supplies are obtainable and rest rooms are available.

A number of moorings are available for hire. A general store, guest house with restaurant, and ship chandlery are available in the village. Engine repairs and electric welding can be made by a garage in the village. Restrooms are also available at the yacht club.

Orcutt Harbor, just westward of Buck Harbor, is about 1.3 miles long and 500 yards wide. Good anchorage is available in depths of 20 to 52 feet in the middle of the harbor just above a small wooded islet on the western side near the entrance. A reef, bare at low water, extends 300 yards southward from **Condon Point,** on the east side of the entrance. When inside this reef, favor the eastern side of the entrance to avoid a sunken rock nearly 200 yards from the western shore and the same distance southward of the wooded islet. In the slight expansion 0.5 mile above the islet, care must be taken to avoid two sunken rocks, one of which is 200 yards from the western shore and the other 150 yards from the southeast side of the expansion. There are several private float landings at the head of the harbor.

Horseshoe Cove is a long, narrow cove, the entrance to which is 0.6 mile southwestward of Orcutt Harbor. The cove is navigable only for small craft with local knowledge. There are no wharves. Privately maintained aids mark the channel to a yacht yard located on the west side about 1 mile above the entrance daybeacon. The yard has a marine railway and can build, or haul out for hull and engine repairs, craft up to 35 feet in length, and 7-foot draft. Covered and open dry winter storage are available. The yard maintains a number of moorings off the yard, which are available for hire. The best anchorage, in 15

feet, mud bottom, northward of the inner daybeacon, is secure in all weathers.

Weir Cove, about 0.7 mile southwestward of Horseshoe Cove, has a private float landing on the east side and two on the west side. **Buck Island,** a wooded islet, is off the entrance to the cove, and a ledge, awash at low water, off the east point of the entrance, is unmarked. The upper half of the cove is mostly dry at low water.

Thrumcap Island, 1 mile northwestward of Pumpkin Island, is grassy and low. **Thrumcap Ledge,** southwestward of Thrumcap Island, is partly bare at high water. **Spectacle Island Ledge,** 0.8 mile southwestward of Thrumcap Island, has a least depth of 6 feet; a buoy is south of the ledge. **Two Bush Ledge,** 1.2 miles south of Thrumcap Island, has a depth of 2 feet; a buoy is off its west side. **Merriman Ledge,** bare only at low water, is 0.4 mile westward of Pumpkin Island; a buoy is on its north side.

About midway between Merriman Ledge and Spectacle Island Ledge is a 13-foot spot marked by a buoy. **Pumpkin Island Ledge,** 0.4 mile northwestward of Pumpkin Island, has a least depth of 12 feet; a buoy is on its west side. A daybeacon is on the shoal just north of Pumpkin Island. **The Triangles,** 0.4 mile northeastward of Pumpkin Island, has a least depth of 2 feet and is marked by buoys on its north and west sides.

Of the islands near the western entrance to Eggemoggin Reach, **Spectacle Islands,** 1.7 miles westward of Pumpkin Island, are grassy; **Two Bush Island,** 1.8 miles southwestward of Pumpkin Island, is bare; **Hog Island,** 2.5 miles southwest of Pumpkin Island, has scattered trees, a house, and barn in the center; **Pond Island,** 0.4 mile northwest of Hog Island, is grassy and has a small clump of trees on the northeast side and a shanty at the south end; **Western Island,** 0.5 mile west of Pond Island, is grassy on its eastern end and has a thick clump of trees on its western end. **Green Ledge,** west of Western Island, is marked by **Green Ledge Light (44°17.4′ N., 68°49.7′ W.),** 31 feet above the water and visible 8 miles, is shown from a white skeleton tower on the ledge. A bell buoy is 600 yards southwestward of the light.

Chart 227.—Deer Island Thorofare is a narrow passage leading along the south side of Deer Isle, between it and the numerous islands southward. The passage joins Jericho Bay on the east and Penobscot Bay on the west, and is a link in the chain of inland passages. Stonington is the principal town on the passage. The thorofare is used occasionally by steamers and extensively by small craft bound through the inland passages. It has a least width of 150 yards in several places, and a least depth of 15 feet in a dredged channel 300 feet wide through the bar between Moose and Crotch Islands. Vessels up to 18 feet in draft are reported to use the passage, but there are unmarked rocks with depths of 9 to 14 feet close to the channel, and local knowledge is required to carry a greater draft than 9 feet at low water. The more important dangers for vessels of this draft are marked, and the channel is easily followed in the daytime in clear weather.

The standpipe at Stonington, the high brick stack on the north end of Crotch Island, and the derricks on Crotch Island are prominent from all directons.

The best **anchorage** for vessels bound through the thorofare and overtaken by night or bad weather is in Southeast Harbor. When overtaken by fog, they may anchor anywhere near the channel where the bottom is soft and the depth suitable. Small vessels anchor on the north side of the channel abreast Stonington, the anchorage most used being north of **Round Island** and between the wharves off Staple Point and the buoy 800 yards eastward. There are a considerable number of moorings off the wharves. A berth at one of these can usually be obtained on application to the **harbormaster.**

Tides and currents.—The mean range of the tide at Stonington is about 9.7 feet. The **tidal currents** follow the general direction of the channel and are not strong. The direction of the currents is influenced by the wind; with strong easterly winds both the flood and ebb set westward, and with westerly winds they set eastward. When not influenced by the wind, the flood sets eastward and the ebb westward, and continues to run about 0.8 hour after high and low waters.

Ice closes Deer Island Thorofare and Southeast Harbor for about a month each winter. During severe winters, solid ice has existed from Stonington to Isle au Haut.

There are two well-marked channels into Deer Island Thorofare from the eastward. The northern channel passes east and south of the buoys marking the ledges off **Green Ledge,** 0.8 mile eastward of Stinson Neck, and enters the thorofare between **Long Ledge,** 0.5 mile south of Green Ledge, and **Potato Ledge,** which extends 0.6 mile northeastward from **Shabby Island,** which is wooded. A daybeacon is on Long Ledge, and a bell buoy is south of the ledge. A buoy is north of Potato Ledge. The channel then leads westward, passing **Lazygut Ledge,** 0.6 mile west of Long Ledge; **Eastern Mark Island Ledge,** 1.4 miles west of Potato Ledge; between **Sheldrake Ledge** and **Haycock Rock,** 0.6 mile southwest of Eastern Mark Island Ledge; **Haskell Ledge,** 0.8 mile west of Haycock Rock, and several other dangers, most of which are buoyed. The northern channel then joins the other channel in the thorofare west of Bold Island Ledges, 3 miles west-southwestward of Potato Ledge.

The southern entrance channel passes south of **Whaleback Ledge,** about 0.8 mile southward of Shabby Island, and runs nearly due west, between **Shingle Island,** 1.1 miles southwest of Shabby Island, and **Saddleback Island,** 0.5 mile south of Shingle Island. The channel then swings northwestward and passes between **Bold Island,** 1.3 miles west of Shingle Island, and **Bold Island Ledges.** This channel is well marked by buoys to its juncture with the other channels. Its eastern entrance is marked by a fairway bell buoy, about 700 yards east-northeastward of Saddleback Island.

Entering from the westward, the principal leading mark is **Deer Island Thorofare Light (44°08.0′ N., 68°42.2′ W.),** 52 feet above the water and visible 13 miles, is shown from a white square tower, on the west side of Mark

Island; a fog signal is at the light. Westward of the light care must be taken to avoid **The Brown Cow**, a rock awash at high water 1.3 miles west-southwestward from the light, and **West Mark Island Ledge**, with a depth of 4 feet over it, about 0.7 mile northwestward of the light; a buoy is south of the ledge. Passing north of the light and south of **Western Deer Island Ledge** and **Bay Ledge**, 0.4 mile north of Mark Island, there should be no difficulty in following the aids, which are colored and numbered for passage westward.

Southeast Harbor is northwestward of the eastern end of Deer Island Thorofare, between **Stinson Neck** on the east and **Whitmore Neck** on the west. The entire harbor is shown on charts 308 and 309, but the entrance and eastern part are shown on chart 227, of larger scale. The harbor is an excellent anchorage for vessels using the thorofare. The entrance is easily distinguished and the principal dangers are marked by buoys. **Oceanville** is a village on the south side of the harbor. The stone wharf at the village is in ruins.

Webb Cove, on the north side of Deer Island Thorofare, has rocks in the entrance but good anchorage inside in depths of 8 to 12 feet. The best water favors the west side of the entrance. **Grog Island**, **Grog Ledge**, and **Humpkins Ledge**, are off the entrance to the cove, and **Channel Rock** is about in the middle of the entrance. A stone quarry with long wharf, with a reported depth of 8 feet alongside, is on the northeast side, at the entrance to the inner half of the cove. In August 1958, the quarry was being reopened and the wharf repaired.

Stonington (P.O.), the principal town on the north shore of Deer Island Thorofare, is the headquarters for the large granite quarries on the adjacent islands. The town wharf has a float landing with 15 feet alongside. The ferry to Isle au Haut leaves daily from the town wharf. Other wharves with service facilities have 6 to 10 feet alongside or at float landings. Gasoline, oil, diesel oil, water, ice, provisions and ship chandlery are available. Bait and fishing tackle can be obtained. The town has a harbormaster.

The fish factory wharf off **Staple Point**, on the east side of the bight off the town, has a depth of about 4 feet at the outer end. The quarry wharf, 200 yards east of the fish factory, has depths of 8 feet and less. A ledge off this wharf has very little water over it. In the cove just east of **Greens Head**, there are several fish wharves, the outer one, on Greens Head, has a float landing with 8 feet alongside. There are highway, telephone, and telegraph communication with the mainland.

Allen Cove, just west of Stonington and east of **Moose Island**, is protected by a pier and breakwater built out from the southeast end of Moose Island. It is known locally as **Yacht Basin**. Sheds of a shipyard on the southeast end of Moose Island are prominent from westward. A fill and roadway connect Moose Island with the mainland. Large lobster pounds occupy the heads of the coves on either side of the fill.

The shipyard builds, or hauls out for repairs, vessels up to 110 feet in length, 11-foot draft, and 250 tons. General hull, engine, electric, and electronic repairs can be made at the yard. Marine hardware, ship chandlery, provisions, ice, and water can be obtained. Gasoline, oil, and diesel oil can be obtained at the end of the breakwater.

Craft up to 85-foot length and 10-foot draft can be hauled out for dry covered and open storage. There is docking space with 10 feet alongside the piers at the yard.

Crotch Island, on the south side of Deer Island Thorofare opposite Moose Island, is the site of an extensive granite quarry. The large quarry wharf on the north side of the island is reported to have a depth of 12 feet alongside. A 75-ton crane is on the wharf.

On the northern side of the western entrance to the thorofare is **Andrews Island**, 60 feet high. Northward of Andrews Island and extending 0.5 mile south of **Fifield Point**, are **Fort** and **Second Islands**, surrounded by off-lying reefs. The 9-foot spot 700 yards westward and the 15-foot spot 700 yards southwestward of Second Island should be avoided. A rock awash at low water is in midchannel between Fort Island and Fifield Point.

Burnt Cove, northeastward of Fifield Point, is secure in all weathers except westerlies. Good **anchorage** is found in mud bottom in midchannel just inside the entrance. The upper half of the cove is shoal and foul. A church spire in the village of **West Deer Isle (West Stonington)**, at the head of the cove, is conspicuous. Oil tanks on the point at the head of the cove make a good mark for entering. A pier and float landing, with 8 feet alongside, is on the south side of the entrance. Gasoline, oil, and some supplies are available and water can be obtained from a nearby well. Diesel oil can be obtained in cans from a float landing on the point at the head of the cove. There are several other private wharves in the cove but these are mostly dry at low water.

Crockett Cove, northwestward of Burnt Cove, is shoal and foul in its upper half. There is reported to be a good small-craft anchorage, secure in all weather, in 18 feet of water about 0.6 mile inside the entrance. It should be approached only after 3 hours after low water on a rising tide, and by favoring the western side of the cove.

Goose Cove, a small bight close westward of Crockett Cove is also reported to be good, though restricted anchorage, except in heavy southerly weather. The cove is foul with awash and sunken rocks in the center, and great care should be taken in entering.

Two rocks awash at low water are off the entrance to the cove, eastward of Barred Island, and another one farther eastward is off the entrance to Crockett Cove.

South of Deer Island Thorofare and north of Merchant Row are many small islands, the more important of which are mentioned below. Navigation among these islands must be considered dangerous for there are many ledges and the channels are unmarked.

Halibut Rocks, in Jericho Bay, 0.8 mile northwest of Marshall Island, are two in number. **Halibut Rocks**

Light (44°08.0′ N., 68°31.6′ W.) 28 feet above the water and visible 6 miles, is shown from a red skeleton tower on the northerly rock; a bell buoy is about 250 yards northward of the light.

West Halibut Rock, 1 mile westward of Halibut Rocks, has a depth of 2 feet over it; a buoy is off the rock. A rock with a depth of 9 feet is 400 yards northeastward of the buoy.

Southern Mark Island Ledge, 2.3 miles west of Halibut Rocks, has a rock bare at high water.

Colby Ledge, 0.8 mile southwest of Southern Mark Island Ledge, is bare at half tide. A daybeacon is on the ledge. A ledge with 15 feet over it is 400 yards southward of the daybeacon. **Colby Pup,** with a depth of 3 feet over it and marked by a buoy, is 0.5 mile south of the daybeacon.

McGlathery Island, 2.5 miles southeast of Stonington, is the largest island on the north side of Merchant Row. A rocky ledge with at least two rocks awash and a sunken rock, extends between the east end of the island and **Gooseberry Island.** The area is foul and passage through it should be avoided.

Barter Island Ledges, 0.5 mile west of McGlathery Island, are covered at high water; a daybeacon is on the ledges.

Harbor Island Ledge is 0.8 mile southward of **George Head Island,** a wooded island 1.4 mile west of McGlathery Island. A buoy is north of the ledge, which has a depth of 3 feet. A 14-foot spot in midchannel 0.5 mile southwest of George Head Island has a buoy off its south side.

Farrel Island, 2.6 miles west of McGlathery Island, and **Scraggy Island,** 0.8 mile west of Farrel Island, are wooded. There are several grassy rocks off the south side of Scraggy Island. **Sparrow Island,** 0.5 mile southwest of Farrel Island, is wooded. **Sparrow Island Ledges** extend 0.5 mile west of the island.

Of the remaining islands in the area, **Bare** and **Round Islands** are wooded, **Buckle, Little Camp,** and **Potato Islands** are bare. **No Mans Island** is wooded on the western end and grassy elsewhere. **Enchanted Island** has scattered trees. **Camp, Rock,** and **Russ Islands** are partly wooded. **Phoebe, Millet, Spruce, Coot, Wreck, St. Helena, Green, Sand,** and **John Islands** are wooded.

Charts 308, 309.—Merchant Row is a passage from Jericho Bay to East Penobscot Bay between the islands and ledges between Deer Isle and Isle au Haut. This passage is used by vessels in winter when Deer Island Thorofare is closed by ice, and by deep-draft vessels at all times. It is not quite as direct as Deer Island Thorofare, but the channel is wider and much deeper. There are numerous ledges and rocks on both sides of the passage, but the principal dangers are marked by buoys or daybeacons, and the channel can be readily followed in clear weather and daylight.

Deep-draft vessels can enter from the eastward, through the passages between Marshall and Swans Islands, and from Jericho Bay. Close attention should be given to the chart and the aids, with due regard for unmarked dangers. The description of the dangers, when entering Merchant Row from the southwestward, in Isle au Haut Bay, is given later in this chapter.

The islands and reefs on the north side of Merchant Row, including many of those in the channel, have been previously described under Chart 227. In fact, Merchant Row could be navigated on that chart for the greater part, but it is better to use Charts 308 or 309 which, although on a smaller scale, show the islands and reefs on both sides of the channel, as well as the approaches. There are two entrances to Merchant Row from the eastward which are separated by the islands and reefs in Jericho Bay.

South of Hailibut Rocks and west of Marshall Island, a series of islands and reefs extends to the eastern entrance to the passage. **Southern Mark Island,** 2.1 miles southwest of Halibut Rocks, is about 30 feet high and grassy. About 1 mile south of Southern Mark Island is **Fog Island,** which is wooded. The numerous ledges east of Fog Island, and between it and Marshall Island, are all bare. The more important of these, since they are closest to the channels, are **North Popplestone Ledge** and **Saddleback** on the north, and **Green, White,** and **Drunkard Ledges** to the south. **Saddleback Island,** in the summer, shows some grass on its two humps, which are conspicuous.

Torrey Ledge, with 17 feet over it, about 0.6 mile southward of Drunkard Ledge, is unmarked. **Blue Hill Rock,** with 7 feet over it about 1.2 miles eastward of Green Ledge, is marked on its southeast side by a buoy.

Of the islands and ledges on the south side of Merchant Row, **Burnt, Pell, Bills, Merchant,** and **Ewe Islands** are wooded. **Hardwood Island** is round and heavily wooded, **Ram Island,** 0.3 mile southwestward of Hardwood Island, is wooded.

Channel Rock, 0.5 mile westward of Ram Island, is covered at high water and is unmarked, as is **Ram Island Ledge,** bare at low water, about 400 yards southeastward of Channel Rock. **Scraggy Ledge** is a bare ledge 700 yards westward of Channel Rock. There is foul ground between Scraggy Ledge and **West Halibut Ledges,** bare ledges 0.3 mile northward. **Outer Scrag Ledge,** 1 mile northwestward of Scraggy Ledge, is partly bare at high water. **The Brown Cow,** 1 mile northwestward of Outer Scrag Ledge, is awash at high water and is the westernmost danger at the western end of Merchant Row. A whistle buoy is about 0.6 mile south-southwestward of the ledge.

Isle au Haut, a large wooded island about 3.5 miles southward of Deer Isle, is one of the principal landmarks of the locality, its maximum elevation being 543 feet. It is quite isolated, and has few inhabitants. The coast is mostly foul and must be approached with caution.

York Island is about 0.3 mile on the eastern side of Isle au Haut near its northern end. A ridge of shoals and reef extends about 1 mile northward from York Island, ending in **Airy Ledge,** which has a buoy off its eastern side.

The channel between York Island and Isle au Haut is almost blocked by a group of rocks. Between **Richs Point,** the northeastern end of Isle au Haut, and York Island,

are numerous reefs and rocks, most of which are marked by heavy growths of kelp. This area should be avoided by all except those having local knowledge.

Foul ground also extends southward of York Island. **Turnip Yard, Halfway Rock,** and **Horseman Ledge,** parts of which bare at low water, extend about a mile south of the island, and are unmarked. An unmarked shoal, cleared to a depth of 15 feet is about 500 yards eastward of Horseman Ledge; and a cleared depth of 12 feet, in midchannel between Halfway Rock and Little Spoon Island is also unmarked.

Little Spoon Island, Great Spoon Island, White Horse, and **Black Horse** comprise a group of grass-covered islands about 1.5 miles south-southeast of York Island. **Great Spoon Ledge,** awash at low water, is 0.3 mile northeast of Great Spoon Island. **Colt Ledge,** 0.6 mile south of White Horse, has a depth of 8 feet. It is marked by a buoy south of it. The chart should be carefully followed in this locality.

Eastern Ear Ledge, with a rock awash at low water, is 0.6 mile southward of **Eastern Ear,** a small island close to the southeast corner of Isle au Haut. A buoy is to the southeastward of the ledge.

Head Harbor is a small bight in the south shore of Isle au Haut, just west of **Eastern Head,** the southeast point of the island. The harbor is used mostly by lobstermen and affords good protection for small boats except in southwest weather. In normal weather, the off-lying ledges break up the swell, causing the water in the northeastern part of the harbor to be fairly calm. The bottom is rocky in general, but some parts are clay. Depths are 9 to 21 feet in the northeastern semi-protected part, and 60 feet and more outside. There are a few houses on the shore in the northeastern part.

The harbor should not be entered without local knowledge, except in periods of good visibility. There are three wharves in the harbor, which dry at low water. A gasoline pump and storage tank is on the innermost of the wharves on the west side of the harbor.

Roaring Bull Ledge, 1 mile south-southwestward of Head Harbor, is bare at low tide. A daybeacon is on the ledge, and a lighted whistle buoy is 2.6 miles southward of the ledge.

Western Ear is a wooded island at the southwest end of Isle au Haut. **Western Ear Ledge,** 0.2 mile southward of Western Ear, is bare at low water.

The western side of Isle au Haut is fringed with many rocks and shoals, bare and submerged. The westernmost ones visible at high water include one of the three bare rocks of **The Brandies,** 1 mile westward of the southern part of Isle au Haut, and **Kimball Rock,** awash at high water 0.6 mile westward of **Kimball Island,** off the northwest side of Isle au Haut.

Several rocky spots with depths of 18 to 30 feet are outside the line joining these rocks. An obstruction, cleared to a depth of 10 feet, is about 0.2 mile westward of Kimball Head, and a rock awash is about 200 yards west of the northern extremity of the head.

Marsh Cove Ledges, drying ledges which extend about 0.4 mile southwestward of **Marsh Cove,** Kimball Island, are marked by a buoy off the southwest end.

Moore Harbor is a cove on the western side of Isle au Haut about 2.5 miles north of Western Ear. This harbor has many outlying ledges off the entrance and in the harbor, and is an unsafe anchorage.

Isle au Haut Thorofare is on the northwestern side of Isle au Haut, between Isle au Haut and Kimball Island. Though called a thorofare, it has a bar at the northeast entrance.

A Federal project provides for a dredged channel 6 feet deep across the bar. In September 1958, the controlling depth was 6 feet.

The thorofare has a width of 100 to 500 yards, being widest at the western end. Secure anchorage for small craft or very small vessels can be had in depths of 33 feet near the town.

Isle au Haut Light (44°03.9′N., 68°39.1′ W.), 48 feet above the water and visible 7 miles, is shown from a tower with its lower part conical, gray in color, and the upper part cylindrical, white in color, at Robinson Point on the south side of the western entrance. There is a white bridge to the shore. The white sector of the light from 034° to 060° covers the fairway to the thorofare. A buoy and daybeacon are off the two principal dangers on the north side near the western entrance, and buoys mark both ends of the dredged channel.

Opposite the town of Isle au Haut and near the southeast end of **Moxie Island,** the channel is narrowed by a ledge with a depth of only 2 to 4 feet. The ledge is so close to the charted 16-foot depth that boats either run on it unawares or come to anchor and are set aground by the falling tide.

Enter Isle au Haut Thorofare between Isle au Haut Light and Sawyer Ledge buoy, and pass southward of Inner Ledge Daybeacon, giving it a berth of over 50 yards. Then keep in midchannel except in the choke at the entrance of the anchorage, where the northern side should be favored slightly. Avoid a rock, bare only at low water, which is 90 yards from the northwest side of the anchorage.

Isle au Haut (P.O.), the village on the south side of Isle au Haut Thorofare, has a town wharf and float landing with 6 feet alongside. Gasoline is available and provisions and some supplies can be obtained from the village store. Water can be procured from a nearby well. The harbor is reported to be free of ice in winter.

In August 1958 a rocky ledge with 2 feet over it was reported in the anchorage off the town wharf. Several other landings in the harbor dry at low water. A white church spire in the village is conspicuous, as is a large hotel on Point Lookout. A motorboat ferry carries mail and passengers daily between Isle au Haut and Stonington.

Lookout (P.O.) is a village and summer resort at the eastern end of Isle au Haut Thorofare. A buoyed channel to the wharf from Merchant Row leads between Merchant and Hardwood Islands. A private spindle marks the eastern extremity of the ledge extending eastward

from **Flake Island**, a grassy island off the village. The wharf has a reported depth of 8 feet alongside.

Chart 1203.—Penobscot Bay, the largest and most important of the many indentations on the coast of Maine, is about 20 miles wide from Isle au Haut on the east to Whitehead Island on the west and 28 miles long from its entrance to the mouth of Penobscot River. A chain of large and small islands divides the bay into two parts, **East Penobscot Bay** and **West Penobscot Bay.** The southern part of East Penobscot Bay is Isle au Haut Bay. **Vinalhaven** and **North Haven Islands** are large islands dividing the southern part of the bay. Long Island divides the bay near its head. Numerous harbors indent the shores of Penobscot Bay, the most important being Rockland, Rockport, Camden, Belfast, and Searsport on the western shore, Castine and Stonington on the eastern shore, and Vinalhaven and North Haven in the center of the bay. The bay is the approach to Penobscot River, on which are several towns and the city of Bangor at the head of navigation.

The sea approaches to the bay are well marked by the lights on Monhegan Island and Matinicus Rock; the entrance by Saddleback Ledge Light on the east and Whitehead and Two Bush Island Lights on the west side of the bay. The harbors are well lighted and the more important dangers are indicated by buoys or daybeacons. Some coasting vessel enter the bay, especially in summer. In winter many of the harbors are obstructed by ice, and the Penobscot River sometimes is entirely closed by it. The thorofares are only occasionally obstructed by ice and are much used by vessels bound along the coast.

Penobscot Bay, a region of rocks and ledges, requires extreme caution in navigating. It can be entered from eastward through Eggemoggin Reach, Deer Island Thorofare, or Merchant Row, and from westward through Muscle Ridge Channel or Two Bush Channel.

Large vessels approaching Penobscot Bay from southward, either from Boston, Cape Cod Canal, or from eastward of Cape Cod, usually make the whistle buoy off Cape Ann, and then shape the course for Manana Island lighted whistle buoy, and then enter through Two Bush or Muscle Ridge Channels. Approaching from westward along the coast, they usually make Bantam Rock lighted whistle buoy. Two Bush Channel is used by most large vessels and tows, and by all except small local vessels when the visibility is not good. Muscle Ridge Channel has good water, and most of the dangers are marked, but it is narrow in places and has a number of unmarked 16 to 22-foot spots near the track. It is not recommended for deep-draft vessels.

The preceding paragraphs give the simplest directions by pointing out the difficulties and the dangers, and especially, when necessary, the need for local knowledge. The channels are well buoyed, most of the dangers well marked and the approaches clear. No difficulty should be experienced in approaching and entering the bay in clear weather, with the aid of the chart and by following the aids.

Boundary lines of inland waters.—The lines established for Penobscot Bay and approaches are described in § **82.5**, Chapter 2.

The mean range of the **tide** varies from about 9 feet near the entrance to about 10 feet in Eggemoggin Reach and near the head of Penobscot Bay. The rise and fall increases in passing up Penobscot River, the mean range at Bangor being about 13 feet.

Pilotage is not compusory for vessels entering Penobscot Bay, but is advisable for those not familiar with the area. Most vessels, including those under coastwise enrollment or license, take a pilot.

Pilots are available at Camden, Belfast, Rockland, or Bucksport. On 36 hours' advance notice, they will meet vessels off Port Clyde, Monhegan Island, Mosquito Island, or Rockland, as requested.

The pilot boat, a lobster boat, equipped with voice radio, can be called on 2182 kc; by the whistle signal of three long and two short blasts, or by the code letters PT on signal light at night.

River and docking pilots are available at Verona Island, Bucksport, or Brewer.

Three modern tugs are available at Belfast. The assistance of tugs in docking at Searsport is advisable and necessary at Bucksport. A tug usually accompanies vessels bound upriver to Bangor and other river points. The services of pilots and tugs are available at all times in the area.

Chart 322.—There is no secure harbor for vessels at any of the islands southward off Penobscot Bay, but the small craft of local fishermen moor in Matinicus Harbor, the cove on the eastern side of Matinicus Island northward of Wheaton Island. The waters of this area are well surveyed; deep passages exist between the islands, as shown on the chart. Because of the broken nature of the bottom, vessels, particularly deep-draft ones, should avoid all broken ground having depths less than 60 feet. These waters are frequented mostly by local fishermen. The only settlements are on Matinicus and Ragged Islands, to which there is communication by launch from Rockland.

Seal Island, the easternmost of the islands off Penobscot Bay, is bare, rocky, about 60 feet high, and 1 mile long. **Eastern Ledge**, on which the sea usually breaks, extends 350 yards off the east end of the island. **Three Fathom Ledge**, 1.4 miles northeastward of Seal Island, has been cleared by a wire drag set at 16 feet. **Gully Ledge**, with a depth of 24 feet, is about 650 yards south of Western Head, the westernmost point of the island.

Seal Island is within the **danger zone** of a naval aircraft bombing target area, centered in 44°53′ N., 68°44′ W., just eastward of the island; limits and **regulations** are given in § **204.1**, Chapter 2.

Snipperahan Ledge, about 3.7 miles north-northwestward of Seal Island, has been cleared by wire drag to a depth of 36 feet.

Malcolm Ledge, midway between Seal Island and

Wooden Ball Island, is 0.4 mile long. The north end of the ledge is awash at high water; the south end is bare at half tide.

Wooden Ball Island, 3 miles southwest of Seal Island, is bare, rocky, about 60 feet high, and 1 mile long. The eastern point of the island is a prominent knob about 80 feet high. There are a few small abandoned houses at the low place in the western part of the island.

Matinicus Rock, the southernmost islet in the approach to Penobscot Bay, is about 40 feet high, and is marked near its south end by **Matinicus Rock Light (43°47.0′ N., 68°51.3′ W.),** 90 feet above the water, visible 15 miles, and shown from the southernmost of two cylindrical granite towers. The radiobeacon and fog signal are synchronized for distance finding.

About 2.3 miles northwest of Matinicus Rock, a group of islands and rocks extends about 5 miles northward. Ragged, Tenpound, and Matinicus Islands and No Mans Land are the principal islands of the group.

Ragged (Criehaven) Island, the southernmost of the group, is partly wooded. There are numerous high bare rocks, including **Green** and **Brig Ledges,** on the east and south sides of the island. Broken ground extends 0.8 mile southward from the island to **Inner Breaker,** which has a depth of 3 feet and is marked by a buoy.

South Breaker is on a small rock, awash at lowest tides, 1.7 miles southward of Ragged Island and 1.6 miles northwestward of Matinicus Rock Light. A buoy is south of the rock. A bell buoy is west of **Southwest Ledge,** 0.4 mile southwest of the island.

Criehaven (P.O.) is a village of fishermen on **Criehaven Harbor,** on the western side of the island. A breakwater extends northward from the southern entrance point; marked by **Criehaven Breakwater Light,** 32 feet above the water, visible 8 miles, and shown from a red skeleton tower. A buoy is 700 yards off the harbor entrance. Shoals are on the south side just outside the entrance to the harbor, and the best water favors the north side. The fish wharf has depths of 7 feet alongside; gasoline and provisions are available. The harbor affords anchorage for lobster boats, but there is no protection from northwesterly blows. The bottom slopes gently except for one dangerous rock, bare 1.5 feet at low water, on the southwest side just inside the breakwater.

Seal Cove, on the opposite side of the island from Criehaven Harbor, is used by the Rockland boats when the harbor is rough. The wharf has almost no depth alongside at low water. Fairly good anchorage is available off Seal Cove in depths of 70 feet, flat sand and shell bottom, for vessels up to 100 feet in length; this anchorage is sometimes used by trawlers during northerly blows.

Shag Ledge, close to the northeast end of Ragged Island, is high, bare, and rocky. **The Hogshead,** 0.2 mile northward of Shag Ledge, is a small bare rock.

Tenpound Island, 0.4 mile north of Ragged Island and 0.3 mile off the southeast side of Matinicus Island, is grassy and has a few trees. **Matinicus Roads,** between Ragged Island and Tenpound Island, has a controlling depth of about 18 feet.

Matinicus Island, 0.8 mile northward of Ragged Island, is partly wooded, and is the largest of the group. **Western** and **Eastern Black Ledges** are bare rocks 0.6 and 0.9 mile eastward of Matinicus Island. **Tuckanuck Ledge,** 200 yards eastward of Eastern Black Ledge, is covered at high water.

Mackerel Ledge, 700 yards north-northeastward of Eastern Black Ledge, is bare at half tide. A buoy is north of the ledge. A rock with a depth of 10 feet is 0.2 mile southward of Eastern Black Ledge.

Wheaton Island is just off the east side of Matinicus Island. The passage between the islands is bare at low water. There are small wharves, and small craft sometimes anchor here. **Old Cove,** westward of the south end of Wheaton Island, is seldom used as an anchorage.

The narrow passage between Wheaton Island and Matinicus Island is used considerably by lobstermen at half tide or better. A small boat attempting this passage should hug the Matinicus side—no more than 5 feet from shore—because of the rounded ledge, bare 3.5 feet at low water, near midchannel.

Matinicus Harbor is on the east side of Matinicus Island behind Wheaton Island; a breakwater extends out from the north side of the harbor to **Indian Ledge.** Small vessels anchor in depths of 11 feet south-southwestward of the ledge but the swinging room is only about 150 feet east and west; the mooring is quite calm except during easterly weather. Numerous lobster boats anchor in depths of 6 feet, sand bottom, at the inner end of the harbor where they are protected from all weather by the breakwater and by the ledge in the center of the harbor.

Matinicus (P.O.), the village at the head of Matinicus Harbor, has facilities for obtaining fuel and other supplies although the principal pier has depths of only 2 feet along the face. A fishing boat ferries passengers, mail, and supplies from Rockland to Matinicus and Criehaven daily during the summer and twice weekly the rest of the year.

Harbor Ledge is a rock with a depth of 4 feet, 300 yards northeastward of the entrance to Matinicus Harbor. A bell buoy is south of the rock. **The Barrel,** 300 yards northeastward of Harbor Ledge, is a rock bare at half tide at the south end of a sunken ledge 300 yards long.

No Mans Land, the largest of the rocks and islets northeastward of Matinicus Island, is grassy and has a shanty on its west side. **Two Bush Islet** is grassy on top and is joined to the northeast end of Matinicus Island by a sunken ledge. **Two Bush Ledge,** high and bare, is 0.2 mile southeastward of the islet. Sunken rocks extend 350 yards eastward and northeastward from the ledge.

Beach Ledges are two rocks, bare at a little below high water, between Two Bush Ledge and Matinicus Island. A buoy marks the southeast end of the ledge. **Whaleback** is a rock, bare at low water, 0.3 mile westward of No Mans Land. A buoy is on the northwest side of the rock.

Zephyr Ledges are two rocks, bare at low water, 0.3

mile northeastward of No Mans Land. **Zephyr Rock,** the northeast end of the group, is a rock with a depth of 5 feet over it, 0.6 mile northeastward of No Mans Land. A buoy is on the northerly side of the rock.

A lighted bell buoy is 0.5 mile north of Matinicus Island and westward of the dangers northeastward of the island.

Local boats bound to Matinicus Harbor from northward carry a draft of 6 feet at low water through the channel between Matinicus Island on the west and Two Bush Island and Beach Ledges on the east. Strangers should use this passage only in small boats and with a smooth sea, being careful to avoid the various ledges.

Black Rocks, several rocks covered at high water, are 0.3 mile westward of Matinicus Island.

Bantam Ledge, a rock bare at half tide surrounded by deep water, is 2.5 miles westward of Ragged Island. A buoy is southeastward of the ledge.

Foster Ledges, 2 miles westward of Matinicus Island, are rocks with depths of 6 and 13 feet over them; the southwestern and shoalest rock has a buoy off its west side. A ledge with a depth of 26 feet is about 0.8 mile northward of the buoy.

Bay Ledge, with a depth of 3 feet, is about 5 miles northward of No Mans Land. A whistle buoy is on the southwest side of the ledge, and a fairway lighted bell buoy is about 1.3 miles southward of it. A ledge, with a least depth of 22 feet, is about 0.5 mile southwestward of Bay Ledge.

Pigeon Ground, 3.5 miles west of Matinicus Island and 2 miles southward of Large Green Island, is broken ground about 2 miles long in an east-northeasterly direction. A least depth of 15 feet is on the western part of the broken ground and a least depth of 21 feet on the eastern part.

Large Green Island, 5 miles northwestward of Martinicus Island, is low and grassy, and has some houses on its northern part. **Herring Ledge,** partly bare at low water, extends 0.3 mile southward from the island.

Green Island Seal Ledges are 0.6 and 0.9 mile south-southeastward of Large Green Island, with broken ground between. The southern part of the ledges is awash at high water; the north end is covered at half tide. A fairway whistle buoy is about 0.8 mile east of the ledge.

Collins Rock, about 1 mile north of Large Green Island, has a depth of 5 feet on it. **Junken Ledge,** with a depth of 18 feet and marked by a buoy on its south side, is about 5 miles north-northeastward of Large Green Island. A fairway lighted whistle buoy is 1.3 miles southwest of Junken Ledge.

Little Green Island, about 1 mile northwestward of Large Green Island, is low and grassy. Fishermen summer on the island.

Northern Triangles, 1 mile northward of Little Green Island, is a reef about 1 mile long in an east-southeasterly direction. In the western half of the reef are some ledges bare at low water. A buoy is about 0.7 mile northward of the eastern end of the reef. A ledge with a depth of 15 feet is 2 miles northward of Little Green Island and 2 miles southeastward of Two Bush Island Light; the ledge is marked by a buoy.

Alden Rock, with a depth of 4 feet over it and marked by a buoy, is 1.4 miles northwestward of Little Green Island. An unmarked rock with a depth of 14 feet is 0.8 mile west-northwestward of Alden Rock. The 14-foot rock is at the eastern end of broken ground nearly 1 mile long and having depths of 25 to 28 feet.

Southern Triangles are three rocks, awash at low water, located midway between Little Green and Metinic Islands. The southwestern rock is 0.6 mile from the other two. A buoy is 75 yards southeastward of the easternmost rock.

Metinic Island, 5 miles west-southwestward of Large Green Island, is nearly 2 miles long, 70 feet high near its nothern end, and partly wooded. The island is occupied during the summer by fishermen. There are no wharves. No supplies are available, or mail service. **Metinic Green Island,** low and grassy, is 0.4 mile southward of Metinic Island, with foul ground between.

There is a passage for small craft drawing about 7 feet, between Metinic and Metinic Green Islands. A rock with a depth of 2 feet is 300 yards southwest of Metinic Green Island.

A bell buoy, about 0.6 mile northward of Metinic Island, guards **Wheeler Rock,** with a depth of 5 feet over it, about 0.3 mile northward of the island; and **Wheeler Big Rock,** awash at high water, is 300 yards northward. **Green Point Shoal,** with a depth of 17 feet, is 0.8 mile eastward of Metinic Island.

Chart 313.—Broken ground extends 2 to 3 miles westward and southwestward from Metinic Island. **Black Rock,** covered at high water, is 0.7 mile westward of Metinic Island. A rock with a depth of 14 feet is 0.3 mile southwestward of Black Rock.

Metinic Island Ledge, with a depth of 8 feet over it and marked by a buoy at its southwest end, is 1.8 miles westward of Metinic Island, on the range of the north end of Metinic Island and the middle of Large Green Island. Kelp is reported on Metinic Island Ledge. A rock with a depth of 26 feet is 0.6 mile northeastward of the ledge. **Hooper Shoal,** with a depth of 17 feet over it, is 0.6 mile southwestward from the ledge.

Roaring Bull, awash at low water and generally marked by breakers, is 2.8 miles westward of Metinic Green Island. A buoy is off the northwest side. A ledge with a least depth of 27 feet is 0.6 mile northwestward of Roaring Bull.

Southeast Breaker is on a ledge about 0.5 mile long in a northeast direction, the higher part of which is bare at half tide. The ledge is 2 miles southwestward of Metinic Green Island, on the range of the south end of Metinic Green Island and the north end of Large Green Island.

Haddock Ledge, with a least depth of 11 feet, is 1.3 miles southward of Southeast Breaker and 2.5 miles southwestward of Metinic Green Island; it is not marked.

Monhegan Island, 9 miles off the mainland and 20 miles westward of Matinicus Rock, is one of the important landmarks for vessels bound along the coast. The island is 1.4 miles long, 160 feet high, and presents a rocky shore with high bluffs in places.

Monhegan Island Light (43°45.9′ N., 69°19.0′ W.), 178 feet above the water and visible 20 miles, is shown from a gray conical tower, connected with a white building, on the middle of the island. Within 3 miles of the island, the light is obscured between west and southwest. The fog signal and radiobeacon, which are synchronized for distance finding, are on **Manana Island,** a small rocky island, about 110 feet high, close westward of Monhegan Island. A lighted whistle buoy is 2 miles westward of the island.

Monhegan Harbor, between Monhegan and Manana Islands, is an anchorage, exposed southward, for small craft. The harbor is used principally by local fishermen, and has depths of 15 to 25 feet with poor holding ground and scant room at the anchorage for a small vessel to swing.

The deeper water in the harbor favors Manana Island. A depth of 6 feet can be taken through the northern entrance, between Monhegan Island and the grass-covered rock on the end of the ledge making out from Manana Island.

In entering, the best water leads close to the end of the wharf. Even small craft should not attempt to ride out bad weather in this roadstead. During heavy weather the daily mail boat frequently is unable to land at the wharf.

Monhegan (P.O.) is a village of fishermen and summer residents on the east side of Monhegan Harbor. The principal wharf has a depth of about 12 feet at the end. The village has telephone communication with the mainland, and communication by a launch carrying mail, freight, and passengers with Boothbay and Port Clyde. Gasoline and provisions are obtainable.

Eastern Duck Rock, 400 yards off the north end of Monhegan Island, is a large, bare rock with some grass on top; the narrow channel between the rock and the island is near the rock. A gong buoy is about 250 yards northwest of the rock.

Duck Rocks, 0.6 mile off the northwest side of Monhegan Island, are two large, bare rocks; on the western rock is a daybeacon. **Sunken Duck Rock,** with a depth of 5 feet, is 350 yards north-northeastward of the daybeacon; a bell buoy is northwest of the sunken rock.

Allen Shoal, 1.9 miles northeastward of Monhegan Island, and cleared to a depth of 22 feet, is unmarked.

Gull Rock Ledge, with a depth of 23 feet, is 1 mile south-southeastward of Monhegan Island Light. Kelp has been reported on this shoal. A bell buoy is on the ledge.

Chart 309.—East Penobscot Bay is that part of Penobscot Bay located eastward of Vinalhaven, North Haven, and Long Islands. The southern part of it, between Isle au Haut and Vinalhaven Island, is called **Isle au Haut Bay.**

There are many islands and numerous unmarked ledges in East Penobscot Bay. The islands have numerous coves and small harbors, but few of these are available as anchorages, except for small craft, because of their shoal depths or obstructed entrances.

The principal traffic through East Penobscot Bay moves in an east-west direction, with access through Eggemoggin Reach, Deer Island Thorofare, or Merchant Row, from the eastward; or through Fox Islands Thorofare, or the channel northward of North Haven Island, from the westward.

A clear channel, good for the deepest-draft vessels, leads from Saddleback Ledge Light to the head of the bay, passing eastward of Eagle Island, marked by a light, and a gong buoy northeastward of the light; thence in a northwesterly direction through the islands, northward of Eagle Island, and thence northward passing close westward of Cape Rosier.

The principal dangers in this channel are marked, and the main part of it, with the exception of the areas near the shores, has been wire dragged. The principal thorofares east and west have also been wire dragged.

Saddleback Ledge Light, the principal guide to the bay, 54 feet above the water and visible 13 miles, is shown from a gray conical tower with white dwelling attached, on a rocky islet in the middle of the southerly entrance to East Penobscot Bay. There is broken ground between the light and Vinalhaven, and deep-draft vessels should enter eastward of the light.

A fairway gong buoy is 0.9 mile southwestward of the light, and a fairway whistle buoy is 0.5 mile eastward of the light.

The islands and dangers on the east side of East Penobscot Bay from the entrance to Barred Island, off the southwestern side of Deer Isle, are nearly all described previously in this chapter under the discussion of Deer Island Thorofare, Merchant Row, and Isle au Haut. Between Deer Island Thorofare and Eggemoggin Reach, the eastern side of the bay is formed by the western shores of Deer Isle and Little Deer Isle.

The only offlying dangers from Barred Island to Southwest Harbor are **Sellers Rock,** part of which bares at low water, and which is marked by a buoy, and the 18-foot spot 700 yards west of it.

Southwest Harbor is on the western side of Deer Isle, about 4 miles north of Deer Island Thorofare Light. The harbor is about 0.3 mile wide at the entrance and 1 mile long. The anchorage in depths of 18 to 28 feet is not used much, being open southward. The village of **Sunset** (P.O.) is on the eastern shore of the harbor; there are no wharves. The western side of the harbor is formed by Sheephead Island, from which **Sheephead Ledges** extend 0.3 mile southward.

Mill Pond, northward of Southwest Harbor, is of little importance. **Sylvester Cove** is northwestward of Mill Pond. The Deer Isle Yacht Club pier and float landing, with 13 feet alongside, and a fish wharf, dry at low water, are on the north side of the cove. A private pier and float landing is on the south side. Eastward of the yacht club landing the cove shoals rapidly to a fine shelving beach. A motorboat ferry carries mail and passengers daily to Eagle, Butter, Bear, and Great Spruce Head Islands.

The anchorage in the entrance of the cove is partly sheltered by a long reef on the south side of the entrance; the reef bares at about half tide. A buoy is on the north

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ern side of the reef. Caution should be used in rounding this reef, by passing northward of the buoy; it is reported that several small craft have grounded on the reef.

The yacht club maintains a guest mooring in the anchorage, but there are no other services available at the landing.

Dunham Point, 0.8 mile northwest of Sylvester Cove, is the westernmost point on Deer Isle. **Dunham Point Ledge** extends 300 yards offshore from the point.

Pressey Cove, about 1 mile northeastward of Dunham Point, is shoal and foul. There are islets on either side and in the middle of the entrance to the cove. The eastern and middle ones are wooded, and the western one has a lone tree and some brush and is connected with the shore by a sand bar. A number of private homes are around the cove.

A ledge, part of which bares at low water, extends 500 yards northwestward from the southern entrance point to Northwest Harbor, 1.4 miles northeast of Dunham Point. Its outer limit is marked by a buoy.

Gull Ledge, partly bare at high water, is 0.4 mile northwest of the southern entrance point to Northwest Harbor. Between Gull Ledge and the buoy off the shoal extending from the point is a narrow channel. Westward of Gull Ledge is a reef which must be avoided even by small boats if using this channel. Its southwest end is marked by a buoy, about 0.5 mile from Gull Ledge and 0.4 mile off the main shore.

Northwest Harbor, on the northwestern side of Deer Isle, is about 0.3 mile wide and over 1 mile long. A large part of the upper half of the harbor is bare at low water. Good anchorage will be found for small vessels in midharbor in depths of 13 to 17 feet, soft bottom. The harbor is sheltered from all but northwesterly winds. Good anchorage also is off the entrance of the harbor, between Gull Ledge and Heart Island, in depths of 19 to 30 feet. During January and February the harbor is closed by ice.

The village of **Deer Isle** (P.O.) is at the head of the harbor. A church steeple in the village is conspicuous. The remains and stone foundation of the old steamer wharf extend about 50 to 100 feet off the northeastern shore of the harbor and are dangerous at all stages of the tide. A crib wharf, with two lumber sheds and three oil storage tanks on it, at the west end of the bridge at the head of the harbor, dries at low water.

The harbor is seldom used save by pleasure craft as an overnight anchorage in fair weather. With the aid of the chart, little trouble should be experienced in approaching and finding anchorage in midchannel up to 0.4 mile inside the entrance, as the entrance is wide and clear. **Heart Island,** about 60 feet high and wooded, is 0.5 mile northward of the entrance.

North of Northwest Harbor, the western shore of Deer Isle extends in a northeasterly direction to **Eggemoggin Reach.** It was formerly possible for small boats to follow this shore and pass between Little Deer Isle and Deer Isle directly into Eggemoggin Reach. This passage now is closed by the highway fill.

The islands off the western end of Eggemoggin Reach were previously described in this chapter. Between Little Deer Isle and North Haven Island, there is a chain of islands through which are many passes; these passes must be used with care because of the many reefs between the islands.

Pickering Island, 1 mile southwest of Little Deer Isle and about 90 feet high, and **Bradbury Island,** 2.5 miles southwest of Little Deer Isle and about 170 feet high, are both wooded, and are the two principal islands north of the main ship channel through East Penobscot Bay.

Hardhead Island, a grassy islet about 90 feet high, is 1 mile southward off Bradbury Island. About 0.7 mile south of Bradbury Island and 0.4 mile northwest of Hardhead Island, is **Middle Rock,** a 10-foot spot on the north side of the main ship channel. A buoy is off the southwest side of the rock.

Southwest of the main ship channel, and between it and North Haven Island, the passes between the islands are nearly obstructed by reefs in many cases. Navigation between these islands, even by small craft, must be done with caution. A few of the reefs are buoyed. Most of the islands are wooded and, with the exception of Eagle Island, have no prominent marks. The more important of these islands are as follows:

Eagle Island, 1.5 miles west of Dunham Point, is wooded. **Eagle Island Light (44°13.1′ N., 68°46.2′ W.),** 106 feet above the water and visible 16 miles, is shown from a white tower attached to a dwelling on the northeast end of the island. A gong buoy is 320 yards east-northeastward of the light. **Eagle** is a small settlement on the island.

Great Spruce Head Island, 2.1 miles northwest of Eagle Island, is the highest island in the group, having an elevation of about 220 feet at the north end. **Bear Island,** just south of Great Spruce Head Island, has a protected anchorage in a cove at its north end in depths of 12 to 30 feet, rocky bottom. A wharf and float in the cove have a depth of about 9 feet alongside.

Butter Island, 0.5 mile northwest of Eagle Island, is partly wooded. The passage between Butter Island and the northeast island of the **Barred Islands,** 300 yards westward, is reported to bare at two-thirds tide. **Oak Island,** 1.5 miles southwestward of Eagle Island, is grassy and uninhabited. **Burnt Island,** just south of Oak Island, is wooded except for its northeast end which is grass covered.

There is a passage northward of North Haven Island which is used in winter when Fox Islands Thorofare is closed by ice. To go through this passage, pass about 300 yards southward of Eagle Island and steer for **Spoon Ledge,** high with grass on top, about 0.5 mile northwest of Oak Island. On this course pass 400 yards northward of **Grass Ledge,** high and grass-covered, 0.9 mile east of Oak Island, to a position about 400 yards northward of Oak Island. Then, pass midway between Oak Island and Spoon Ledge and steer for Rockland Breakwater Light. The least charted depth in this passage is 25 feet.

The western side of the southern part of East Penobscot Bay is very foul. **Saddleback Ledge Shoal,** with a depth of 2 feet and marked by a buoy, is 0.8 mile northwest

of Saddleback Ledge Light. The mile-wide channel west of this shoal and east of **Diamond Rock** and Diamond Rock Ledge has several shoal spots with depths ranging from 14 to 28 feet. The fairway gong buoy, about 0.9 mile southwestward of Saddleback Ledge Light, marks the southern entrance to this channel. **Diamond Rock Ledge,** with a depth of 2 feet, is marked by a buoy.

Between this channel and the southeast shore of Vinalhaven Island are many islands and reefs dangerous to navigation. A buoyed channel through these islands and reefs enables vessels of moderate size to run parallel to the shore, at distances of from 0.5 to 1 mile, in daylight and with good visibility, on a partially protected route around the south end of Vinalhaven Island, to Carvers Harbor, or West Penobscot Bay.

On the north and northwest edges of this channel, along the southeast side of Vinalhaven Island, and marked by buoys, are **Triangle, Halibut, Crosby, Sheep Island,** and **Bunker Ledges,** and **Point Ledge,** off the entrance to Indian Creek which is marked by a daybeacon.

Farther inshore, and unmarked, are **Green, Narrows,** and **Sheep Islands,** and **Point, House, Griffin, Green, Clam, Wreck,** and **Folly Ledges.** Southward of the buoyed channel are the **Brimstone, Hay,** and **Roberts Islands,** and **Carvers** and **Otter Islands.**

Surrounding and interspersed between these islands are numerous rocks and ledges, unmarked and dangerous to navigation. **Arey, Colt,** and **Heron Neck Ledges,** and **The Breakers,** dangerous ledges only partially marked by buoys, lie to the westward, in the southern approach to Carvers Harbor.

Arey Cove and **Roberts Harbor,** on the southeast side of Vinalhaven Island, are much obstructed by rocks and ledges, and are unsafe for strangers.

The coast northward to Bluff Head and the eastern entrance to Fox Islands Thorofare has many off-lying islands and reefs, extending in some places nearly a mile offshore. The coves are small and foul, and of no value as harbors.

Winter Harbor, Seal Bay, and **Smith Cove** make into the northeastern part of Vinalhaven Island, south of the eastern entrance to Fox Islands Thorofare. They are not safe for a stranger to enter, and are of little commercial importance.

Carver Cove and Kent Cove are two excellent anchorages, easily entered by strangers, in Fox Islands Thorofare near its eastern entrance.

The preceding paragraphs give the simplest directions for East Penobscot Bay by pointing out the difficulties and the dangers, and especially, when necessary, the need for local knowledge. By close attention to the chart and by following the aids, no difficulty should be experienced in navigating the bay in daylight and in clear weather.

Chart 235.—Fox Islands Thorofare, leading from East Penobscot Bay to West Penobscot Bay, between North Haven and Vinalhaven Islands, is one of the chain of inshore passages commencing at Bass Harbor and ending at Whitehead. Fox Islands Thorofare is about 7 miles long, and the channel, with a depth of 16 feet, or more, has a least width of about 150 yards in several places.

The principal dangers are marked by buoys or daybeacons which can be easily followed in the daytime with clear weather. Although the least depth in the channel is 16 feet, the thorofare is seldom used by vessels of over 14 feet draft at low water. The main channel has been examined by means of a wire drag.

Prominent features.—Widow Island, inside the eastern entrance to Fox Islands Thorofare, is marked by a small cottage.

Goose Rocks Light (44°08.1′ N., 68°49.9′ W.), 51 feet above the water and visible 13 miles, is shown from a white conical tower on a black cylindrical foundation; a fog signal is at the light. A white sector in the light, from 291° to 307° marks the fairway for the eastern approach to the thorofare.

Browns Head Light (44°06.7′ N., 68°54.6′ W.), 39 feet above the water and visible 11 miles, is shown from a white cylindrical tower connected with a dwelling; a fog signal is at the light. A white sector in the light, from 050° to 061°, with a red sector on either side of it, marks the fairway for the western approach to the thorofare. A fairway lighted bell buoy, about 2.4 miles southwestward of the light, marks the western entrance.

Sugar Loaves, a group of prominent high rocks surrounded by a ledge, is 600 yards northwestward of Browns Head Light. **Fiddler Ledge Daybeacon,** a gray, square stone shaft with a pyramidal top, 1.4 miles westward of Browns Head Light, is a conspicuous mark when approaching from the westward. A daybeacon is on **Drunkard Ledge,** 0.5 mile westward of Fiddler Ledge Daybeacon. Broken ground, which should be avoided, extends 0.2 mile southward of the line joining the daybeacons. A gong buoy is on the southern extremity of the broken ground.

A large standpipe on the high ground just back of North Haven shows up prominently in approaching from either direction.

Tides and Currents.—The currents in Fox Islands Thorofare are not strong; they meet at **Iron Point,** in the middle of the thorofare, the flood setting in from both ends and the ebb setting out. The mean range of the tide is about 9.5 feet.

The thorofare is sometimes closed by ice in the winter season.

On the north side of the eastern entrance to Fox Islands Thorofare are **Babbidge, Calderwood,** and **Stimpsons Islands.** North of these islands is Little Thorofare which can be used by small craft with local knowledge. Ledges extend for over 0.3 mile south and southeast of these islands. A buoy, 0.6 mile off Babbidge Island, is on the north side of the east entrance to Fox Islands Thorofare.

Of the several reefs south of these islands, the most important are **Black Ledge, Sunken Black Ledge,** and **Channel Rock.** A buoy is just south of Sunken Black Ledge. Channel Rock is marked by a bell buoy and a daybeacon.

Carver Cove, in the south shore of Fox Islands Thorofare, near its eastern end, is a secure anchorage, easy of

access, and convenient for vessels windbound in East Penobscot Bay or passing through the thorofares. The anchorage, in depths of 16 to 20 feet, good holding ground, is about 0.5 mile from the head of the cove, and 197° from the cottage on Widow Island. When entering the shores should be given a berth of about 300 yards. An unmarked 18-foot rocky patch is about in the middle of the eastern entrance.

Kent Cove, in the north shore of the thorofare north of Widow Island, is a secure anchorage with depths of 15 to 24 feet, good holding ground. Goose Rocks Light is the prominent guide for entering either in the daytime or at night, the entrance being westward of the light. **Kent Ledge,** the only outlying danger, has a depth of 5 feet over it and is 500 yards from the northwest shore of the cove off the entrance.

Waterman Cove, in the north shore of the thorofare west of Kent Cove, is a good anchorage for small vessels. The water shoals gradually from a depth of 18 feet at the entrance to 4 feet near the head, where a narrow channel leads into the **Cubby Hole,** a shallow cove. **Waterman Ledge,** with a depth of 4 feet and marked by a buoy, is in the mouth of Waterman Cove 500 yards from the western shore.

Fish Point Ledge, partly bare at half tide and marked at its southeast end by a buoy, is 400 to 600 yards southeastward of **Fish Point,** on the eastern side of the cove. Foul ground is between the point and the ledge. The better entrance to the cove is between the buoys off Fish Point Ledge and Waterman Ledge.

Seal Cove is a large arm extending 1.5 miles southward from Fox Islands Thorofare southeastward and on the opposite side of the channel from the village of North Haven. Large areas in the cove have depths of 8 to 12 feet, bottom soft in places, but shoaling has been reported in the middle of the cove.

Good anchorage can be selected in the channel of the thorofare between the entrance of Seal Cove and the western end of the village of North Haven, in depths of 23 to 33 feet, soft bottom.

Perry Creek, a long narrow arm making westward on the west shore of Seal Cove, is of no importance as an anchorage, and should be avoided by strangers. Overhead power cables cross the creek in three places, as shown on the chart.

Southern Harbor makes northeastward between the **Dumpling Islands** and **Amesbury Point,** near the western end of the thorofare. Good anchorage in depths of 19 to 23 feet, soft bottom, is in the middle of the harbor. The water shoals gradually toward the head.

Good anchorage for vessels of any draft, in depths of 32 to 42 feet, soft bottom, is in the western entrance of Fox Islands Thorofare, westward or northward of Sugar Loaves, and between Amesbury Point and **Crabtree Point Ledge,** 1.7 miles southwestward.

North Haven (P.O.) is an important yacht center on the north shore of Fox Islands Thorofare. Small craft can anchor on the north side of the channel, taking care to leave a clear channel to the town wharf and ferry slip. Two ledges off the town, both marked by buoys, must be avoided. The town wharf has a depth of about 12 feet, and the other wharves less.

The yacht club and several wharves have float landings with depths of 4 to 5 feet alongside, and restrooms and showers are available at the club. Diesel oil, gasoline, coal, fresh water, ice, provisions, and other supplies are available at the other float landings.

There is a marine railway capable of hauling out boats up to 60 feet in length for repairs or winter storage. Automobile, mail, and passenger ferry service to Rockland is maintained the year around, and an automobile ferry plies between North Haven and Vinalhaven Island. Telephone and telegraph communication are available with the mainland. There is an inn and restaurant in the village.

The north shore of Vinalhaven Island, across the thorofare from North Haven, has numerous summer residences with private landing floats.

In the western approach to Fox Island Thorofare, on the south side, are **Dogfish Ledges,** marked by a daybeacon; **Seal Ledge,** the north end of which is marked by a buoy; and **Inner Bay Ledges,** forming the westernmost danger in the western approach and marked by several buoys. The main entrance channel is north of these ledges and is well buoyed. The channel southeast, between these ledges, is also well buoyed for the guidance of those vessels going to Hurricane Sound and the southern part of Vinalhaven Island.

Crockett Cove is just eastward of Crockett Point, the southeastern point at the western entrance to Fox Islands Thorofare. The cove is about 1 mile long and 200 yards wide near the entrance, is obstructed by ledges, and is suitable only for small craft with local knowledge.

Dogfish Island, 0.4 mile south of Crockett Point and northwestward of Leadbetter Narrows, has a stone wharf at its eastern end.

Leadbetter Narrows is a narrow passage between Vinalhaven Island on the north and **Leadbetter Island,** 0.3 mile southeast of Dogfish Island, on the south. Continuing south of the eastern side of Leadbetter Island, a passage leads in the northern end of Hurricane Sound. When passing through the narrows, the northern shore of Vinalhaven Island shore should be favored.

A small stone wharf is on Leadbetter Island at the narrows. There is also an inactive quarry and wharf on the shore of Vinalhaven Island eastward from the narrows. Leadbetter Narrows should not be attempted by strangers except in the case of launches or small craft.

Charts 310, 322.—Laireys Narrows, between Leadbetter Island on the north and Laireys and Cedar Islands on the south, is a part of the route between Carvers Harbor and Rockland. The principal dangers are buoyed. **Crotch, Crane,** and **Spectacle Islands** lie southward of Laireys and Cedar Islands. A safe anchorage is reported to be had in 6 to 8 feet, between Crotch Island and the northwestern end of Crane Island.

The Basin is a large irregular bight in the west side of Vinalhaven Island, about 2 miles southeast of Crockett Cove. **Barton Island** is in the middle of the

entrance, leaving a narrow, crooked, and shallow channel north of it. The depth of water in the basin varies from 10 to 111 feet.

Carvers Harbor is a secure anchorage for small vessels on the southwest side of Vinalhaven Island. There are general depths of 6 to 12 feet in the anchorage.

Carvers Harbor Entrance light (44°02.1′ N., 68° 50.7′ W.), 19 feet above the water and shown from a red spindle on the west end of **Green Ledge,** marks the entrance to the harbor. **Ice** seldom closes the harbor.

Mail, automobile, passenger, and freight service is maintained with Rockland. **Pilots** can be obtained from among the fishermen. The best anchorage for small craft is reported to be on the east and southeast side of the harbor, as the center of the harbor is reported to be foul with kelp, and the western side is principally used by commercial craft and fishermen. The north side is reported to be foul with rubbish, and shoal.

There is a harbormaster. A speed limit of 5 miles per hour is enforced within the harbor.

Vinalhaven (P.O.), a town at the head of the harbor, is of some importance for its shipment of frozen fish. A standpipe back of the town is prominent. The deepest draft vessel, a buoy tender, entering, is 16 feet. The depths at the ferry wharf and float landings vary from 4 to 12 feet. Diesel oil, gasoline, bottled gas, water, provisions, and ship chandlery are available at the landings. There are four boatyards on Vinalhaven Island. Craft up to 35-foot length and 6-foot draft can be hauled out for hull or engine repairs or dry open or covered winter storage. Electric and electronic repairs can be made. There is telephone communication with the mainland.

Sand Cove, making northward from Carvers Harbor, is foul. There are several wharves at the head at which vessels lie aground at low water while loading pulpwood.

Indian Creek, just eastward of Carvers Harbor, has an entrance from the sea and also a connecting passage to Carvers Harbor. A fixed highway bridge crossing the passage has clearance of 8 feet. The passage is not safe for strangers. The island forming the west side of Indian Creek is known locally as **Lane Island.** The island is grassy with two prominent white houses visible from the southward.

Heron Neck Light (44°01.5′ N., 68°51.7′ W.) 92 feet above the water and visible 15 miles, is shown from a white tower connected to a dwelling on the southern extremity of **Green Island,** on the eastern side of the entrance to West Penobscot Bay. The light is obscured close-to between 312° and 318°; it has a white sector from 030° to 063° which marks the fairway of the approach to Carvers Harbor from the southwest; a fog signal is at the light. **Folly Ledge,** bare at high water, a dangerous unmarked ledge, is off the eastern end of Green Island, and on the western side of the southern approach to Carvers Harbor.

The Reach is a narrow, much-obstructed channel leading northwestward from the entrance of Carvers Harbor, between Green Island and Vinalhaven Island. The passage is buoyed and used by vessels bound between Carvers Harbor and Rockland. The channel at its narrowest is only 100 feet wide, between the northeastern edge of the ledge marked by a daybeacon and a rock with 3 feet over it, about 200 feet northeastward of the daybeacon. Great care is required in passing this point.

Old Harbor is a small cove at the northern end of The Reach and on the opposite side of the channel from the northern end of Green Island. Caution is necessary in using this harbor because of the many old fish stakes, and a ledge of drying rocks extending southward of the island in the entrance of the harbor.

Hurricane Sound is bounded on the east by Vinalhaven and Green Islands and on the west by **Hurricane Island,** 0.7 mile west of Green Island, and **White Islands,** a group of islands about 1.5 miles northwest of Green Island. The sound has deep water. Several passages lead into the sound, but there are no good anchorages.

It is reported that there is a good black pebble beach in the cove on the south side of Hurricane Island, and that the old stone quarry pier on the northeast side of the island affords a good landing place in good weather.

Along this part of West Penobscot Bay, numerous rocks and reefs extend over 2 miles offshore from Vinalhaven Island and the bottom of the bay is irregular with many spots of 10 to 18 feet for about 2 miles farther offshore. The better passes among the islands are buoyed. Great care must be used to avoid the numerous reefs.

The preceding paragraphs give the simplest directions by pointing out the difficulties and the dangers, and especially when necessary, the need for local knowledge. Pilots can be obtained from among the local fishermen. Vessels of 12-foot draft or less should experience no difficulty, in daytime and in clear weather, in approaching and entering. Strangers should bear in mind that many unmarked dangers will of necessity have to be passed close-to, and should exercise extreme caution by giving strict attention to the chart, and following the aids.

Chart 310.—The western entrance to Fox Islands Thorofare and the off-lying dangers are described under the discussion of the thorofare.

Bartlett Harbor is a small cove with deep water and good anchorage sheltered from all but westerly and northerly winds. The harbor on the western shore of North Haven Island is about 2 miles above **Stand-in Point,** the southwestern point of North Haven Island. A rock with a depth of 9 feet over it is in the middle of the entrance; deep water is close-to around the rock.

Pulpit Harbor, on the northwest side of North Haven Island, is 4 miles northeastward of Stand-in Point and 2.5 miles southwestward of **Webster Head,** the high and partly wooded head at the north end of the island. The entrance has a clear width of over 100 yards, and the harbor is a secure anchorage for small vessels of about 13-foot or less draft.

Pulpit Rock, high and pointed, is near the end of the reef extending 250 yards northeastward from the western point at the entrance. The rock is a good mark. To enter,

give the north side of Pulpit Rock and the eastern shore just northward of the entrance a berth of over 100 yards, and enter in midchannel eastward of Pulpit Rock. Keep in midchannel and anchor in its broad part in depths of 18 to 33 feet.

Another good all weather anchorage for small craft is reported to be in the southwesterly prong, just inside the entrance, in 18 to 27 feet. More sheltered anchorage in 8 to 10 feet is toward the northeast end of the harbor, where there is a public float landing with 3 feet alongside. There is a telephone at the landing. Gasoline, provisions and most supplies can be obtained by phoning to North Haven from the landing.

Pilots for these waters usually can be obtained at Rockland, North Haven, or Vinalhaven, or from local fishing boats.

North of North Haven Island are numerous islands and reefs, extending to Cape Rosier. Most of these have been described previously. The most westerly of the islands and reefs is **Egg Rock,** which is small and grass-covered, and 2 miles north of Pulpit Harbor. **Egg Rock Ledge,** 0.3 mile southwest of Egg Rock, has a least depth of 2 feet. A buoy is on the northeast side of the ledge.

Compass Island Ledge, 1.4 miles northeastward of Egg Rock, has a depth of 8 feet; a buoy is off the ledge. A rock awash is about 300 yards northeastward of **Compass Island,** which is 0.7 mile northward of Compass Island Ledge. Ledges extend up to 0.3 miles eastward of the island. **Grass Ledge,** a group of dry rocks, rocks awash, and sunken rocks, is between Compass Island, **Scrag Island,** and **Little Spruce Head Island,** which is westward of **Great Spruce Head Island.**

Horse Head Island is about 0.6 mile northward of Little Spruce Head Island. **Colt Head Island,** and still another group of **Barred Islands,** are westward and northwestward, respectively, of **Beach Island,** which is 0.9 mile northward of Great Spruce Head Island. **Resolution Island,** the northwesterly island of this group of islands between North Haven Island and Cape Rosier, is about 93 feet high and wooded.

The passage through these islands, just north of North Haven Island, has been described previously.

Chart 1203.—Long Island (Islesboro) and the adjacent islands and shoals are about 15 miles long, and separate East and West Penobscot Bays near their heads. Long Island is nearly divided in the middle. The island is an important summer resort, and is frequented by many pleasure boats in summer. Dark Harbor, Islesboro, North Islesboro, and Pripet are villages on the island. An automobile ferry is operated between Lincolnville, on the mainland, and Grindel Point.

Chart 310.—A chain of islands and rocks, through which are several channels, extends for 5 miles southward from Long Island. **McIntosh Ledge,** the most southerly of the dangers and about 0.7 mile southeastward of Robinson Rock, is awash at low water. A buoy is on the southeast side of the ledge.

Robinson Rock, the most southerly visible danger, is a grassy rock with several smaller bare rocks around it. Ledges extend for 0.6 mile north-northeast and south-southwest of the rock. There is a whistle buoy south of the southern end of these ledges.

Mark Island, the most southerly wooded island, is high, rounded, and prominent. A daybeacon is on the reef, which extends southward from the island.

East Goose Rock, 0.5 mile northward of Mark Island, is about 15 feet high and grassy. **Saddle Island,** 0.7 mile east-northeastward of Mark Island is thickly wooded.

Lasell Island, 1.2 miles northeast of Mark Island, is high and wooded except at its north end. **Goose** and **Mouse Islands,** eastward of Saddle and Lassell Islands, are rocky islets with grass on top. Several bare and submerged rocks are between Goose and Mouse Islands. A daybeacon is on the ledge northeastward of Mouse Island, and a buoy is eastward of the rocks east of Goose Island.

Lime Island, 0.2 mile northeastward of Lasell Island, is low and generally wooded. A bare rock is 0.2 mile northeastward of Lime Island. **Job Island,** 0.7 mile northeastward of Lime Island, is thickly wooded. The southerly of the **Ensign Islands,** 0.7 mile west of Job Island, is wooded, and the northerly is wooded in the center with a house on the west side. A landing is on the east side.

The channel between Mark, Lasell, and Lime Islands on the west, and Saddle, Goose, and Mouse Islands on the east, is used by some vessels bound from Rockland or westward to Eggemoggin Reach or points in the northern part of East Penobscot Bay. The least found depth is 29 feet, and the principal dangers are marked.

Dark Harbor (P.O.) is a village with many summer homes, on the southern part of Long Island. There are grocery, drug and hardware stores, a snack bar, and gas station. The cove of **Dark Harbor** on the eastern side of the island is crossed by a dam and footbridge just inside the entrance, and is seldom used. Small craft visiting the resort tie up at the yacht club or other private floats in Gilkey Harbor.

Gilkey Harbor, on the western side of the southern part of Long Island, is between Long Island and **Seven Hundred Acre, Warren,** and **Spruce Islands.** The harbor is a secure anchorage with good holding ground, and is frequented by many yachts in summer. There are a number of private float landings for small craft but no commercial wharves. The harbor frequently is closed by ice in winter.

The Tarritine Yacht Club is on the east side of **Ames Cove,** near Dark Harbor; the clubhouse has a float landing with a depth of 4 feet alongside. Some supplies can be obtained from the village and water is piped to the float.

Cradle Cove is a shallow indentation on the northeast side of Seven Hundred Ace Island. A boatyard, near the head of the cove, has a machine shop, and a marine railway capable of hauling out craft up to 60 feet in length for hull and engine repairs, and dry covered or open winter storage. Electric and electronic repairs can be made, and the yard has a small crane and pile driver.

Gasoline is piped to the pier and float landing, which has 3 feet alongside. Water, some provisions, hardware, and ship chandlery are available, and the yard maintains guest moorings. Launch service to the ferry at Grindel Point can also be had.

The main entrance to Gilkey Harbor is from southwestward, between Job Island and Ensign Islands, and has a least depth of about 27 feet in midchannel. Unmarked rocks of less depth are near the sides. The channel is partially buoyed and easily entered. The entrance from the northward is marked by **Grindel Point Light,** 21 feet above the water and visible 6 miles, shown from a black skeleton tower close to an abandoned lighthouse on the north side of the entrance. The ferry slip, and a float landing with 12 feet alongside, are close southeastward of the light. A bell buoy is west of the entrance, and the channel into Gilkey Harbor is partially marked by buoys.

Provisions and some ship chandlery can be obtained from Islesboro.

Small craft can enter Gilkey Harbor by a narrow crooked channel, **Bracketts Channel,** westward of the south end of Long Island and eastward of Job Island and **Minot Island.** The channel is said to be good for a depth of about 6 feet at low water with local knowledge. The best water favors the east side.

No difficulty should be experienced in entering Gilkey Harbor from the southward or northwestward with close attention to the chart and bearing in mind a number of unmarked 14- to 18-foot spots in the northern half of the harbor. **Thrumcap,** a wooded islet near the middle of the harbor has a reef extending westward from it which is marked by a buoy. **Lobster Rock,** just inside the northern entrance, is unmarked.

Gooseberry Point, 0.6 mile northeastward of Grindel Point, is low and flat, with a clump of trees at its outer end. Crow Cove, 2.4 miles northeast of Grindel Point, is an anchorage for small craft only.

Seal Harbor, on the western side of Long Island about 3 miles northeastward of Grindel Point, offers good anchorage sheltered from all but southwest winds. This harbor, easy of access, is used by vessels bound up or down the bay as an anchorage for the night. Some yachts go to a pier inside the harbor. Vessels of any size can anchor with ample swinging room about 0.5 mile eastward of Flat Island, in depths of 54 to 66 feet. Anchorage can also be had in depths of 48 to 57 feet in the middle of the harbor, keeping the southern and eastern shores distant about 500 yards. The northern side of the harbor is foul. The wreck of a schooner, covered 5 feet at low water, is about 0.2 mile from the head of the harbor.

The entrance to Seal Harbor from the southward is deep and clear. The entrance from northwestward is 400 yards wide, with depths of 18 to 29 feet, between Seal Island and a shelving ledge which extends 500 yards northward from Flat Island.

Flat Island, on the western side of the southern entrance to Seal Harbor, is grassy, with a few trees and scattered brush. **Seal Island,** 0.6 mile north of Flat Island, is wooded and has a white summer residence with red roof on its western side. **Hog Island,** 0.2 mile northward of Seal Island, is wooded. The ledge extending 0.3 mile northward from Hog Island has three rocks bare at half tide.

Islesboro Harbor is an open bight in the east side of Long Island, 2.7 miles westward and on the opposite side of East Penobscot Bay from Cape Rosier. The harbor affords good shelter in westerly winds, and has a depth of about 42 feet. **Hewes Ledge,** off the southern point at the entrance, is partly bare at half tide and is marked by two buoys. Vessels can pass on either side of the ledge, being guided by the buoys. Foul ground extending over 0.2 mile from the western shore will be avoided by keeping the knoll northward of the harbor open from the north point of the harbor.

The village of **Islesboro** (P.O.) is on the south side of the harbor. There are several private float landings in the harbor. The village has a general store where ship chandlery is available.

Sabbathday Harbor is a small cove in the eastern side of Long Island and a little over 2 miles northward of **Hewes Point,** the high point on the south side at the entrance to Isleboro Harbor. Sabbathday Harbor is open southward, and provides anchorage for small vessels in depths of 6 to 20 feet. The village of **North Islesboro** is on the west side of the harbor. There is a filling station and restaurant in the village.

Chart 311.—Sprague Ledge, 0.5 mile north-northeastward of Hog Island and about 0.5 mile off the west shore of Long Island, has a least depth of 2 feet. **Barley Ledge,** 0.3 mile northeastward of Sprague Ledge, is bare at low water.

Marshall Point, near the north end of Long Island, is marked by prominent yellowish bluffs.

Turtle Head Cove, a broad bight in the north end of Long Island, is sheltered from southerly and easterly winds, and has good anchorage in depths of 18 to 37 feet, soft bottom. The anchorage has a clear width of about 700 yards and is in the eastern part of the cove. The eastern shore must be given a berth of 250 yards, and the south end of the cove 500 yards.

In the western half of the cove, a shoal, bare in one spot at low water and with a depth of 9 feet near its north edge, extends 600 yards from shore. The north end of Turtle Head bearing anything eastward of 062° clears the shoal.

Turtle Head, the north end of Long Island, is a prominent wooded head joined to Long Island by a long, narrow, wooded neck. The village of **Pripet** is southward of Turtle Head. A crib wharf at Pripet is reported to have 12 feet alongside.

Parker Cove, on the east side of Long Island 2.2 miles south of Turtle Head, is a shallow cove used only as an anchorage by small local craft. **Long Island Ledge** is eastward of the entrance; a buoy is off the southeast side of the ledge.

Chart 322.—Two Bush Channel and Muscle Ridge Channel are entrances to West Penobscot Bay from westward, the former leading southward and the latter northward of an extensive group of islands and shoals.

Two Bush Channel is broad and deep, and the principal dangers are buoyed. This channel is used in preference to Muscle Ridge Channel by large vessels and tows, and is generally used at night by all except small local vessels.

Two Bush Island, the southeastern island of the group between the two channels, is marked by **Two Bush Island Light (43°57.9′ N., 69°04.5′ W.)**, 65 feet above the water and visible 14 miles, shown from a white square tower on the north side of Two Bush Channel; a fog signal is at the light. The light is obscured between 061° and 196°, and has a red sector from 196° to 247°. The light is the principal guide to the channel.

Halibut Rock, bare at half tide and marked by a buoy, is 1.6 miles northeastward of Two Bush Island Light. **Northeast Pond Ledge,** 0.6 miles northeastward of **Andrews Island** and 1.8 miles northward of Halibut Rock, is bare at half tide.

The larger islands between Two Bush Channel and Muscle Ridge Channel are mostly wooded, and of little importance. The small islands are bare and grassy, and there are many bare and submerged rocks. **Dix Island,** 2.7 miles north of Two Bush Island, is wooded. **High Island,** 0.2 mile northeastward of Dix Island, has an abandoned quarry on it. **Birch Island,** just east of Dix Island and south of High Island, is about 20 feet high. **Fisherman Island,** about 5 miles north-northeast of Two Bush Island, is grassy. **Marblehead Island,** 0.3 mile south of Fisherman Island, is bare.

Muscle Ridge Channel is used in daylight and clear weather because it is sheltered, and affords anchorage in case of bad weather. The channel is good for a depth of 22 feet, but it is narrow in places, especially to the westward of Sheep Island. From the entrance at Whitehead Island, the channel extends in a northeasterly direction about 6 miles to Sheep Island, passing between numerous rocks and ledges. These dangers are well marked, and in daylight and clear weather no difficulty should be experienced.

Whitehead Island is on the west side of the southern entrance to Muscle Ridge channel. **Whitehead Light (43°58.7′ N., 69°07.5′ W.)**, 75 feet above the water and visible 14 miles, is shown from a gray tower attached to a red brick house, on the east end of Whitehead Island; a fog signal is at the light.

There is a small wharf in the cove on the northeast side of the island 300 yards northward from the light. The narrow channel between Whitehead Island and **Norton Island,** 500 yards westward, is blocked by a reef with a depth of 3 feet over it at high tide.

The following information concerning the dangers close to the sailing line through Muscle Ridge Channel is given to identify the dangers. **South Breaker,** 0.4 mile southward and on the opposite side of the channel from Whitehead Light, is awash at low water and marked on the southwest end by a bell buoy. **Yellow Ledge,** about 0.5 mile east, on the opposite side of the channel from Whitehead Light, is awash at high water, and marked by a daybeacon.

Lower Gangway Ledge, 0.4 mile north of Yellow Ledge, has a depth of 6 feet; a buoy is west of the ledge. **Hurricane Ledge,** 1 mile northeastward of Yellow Ledge, is bare at lowest tides and marked on its northwest side by a buoy. **Garden Island,** about 2 miles northeastward of Whitehead Island, is bare except for a little grass on top. **Garden Island Ledge,** 0.3 mile east-northeastward of Garden Island is bare at half tide; a daybeacon is on the ledge. **Sunken Ledge** with a depth of 4 feet, about 0.3 mile southward, is marked by a buoy off its south end.

Wiggins Rock, with a depth of 9 feet, is about 750 yards north-northeastward of Garden Island Ledge and there are two rock patches with 9 and 12 feet, respectively, about 500 yards northwestward of Wiggins Rock. **High Clam Ledge,** 0.8 mile northeast of Hurricane Ledge, is bare and grassy at its south end and bare at low water at its north end. **Channel Rock,** 0.4 mile north of the bare part of High Clam Ledge, is awash at high water and unmarked.

Otter Island, 0.5 mile north of Dix Island, is wooded; a daybeacon is on the northwest end of ths island. **Otter Island Ledge,** 0.3 mile northwestward, on the opposite side of the channel from Otter Island, is bare at half tide; a daybeacon is on the ledge. **Upper Gangway Ledge,** 0.6 mile north of Otter Island, has a depth of 5 feet and is marked by a buoy. **Inner Grindstone Ledge,** bare at low water, is 0.3 mile east of Upper Gangway Ledge; a buoy is north of the ledge.

Seal Harbor, an anchorage formerly much used by coasters, is on the western side of Muscle Ridge Channel, between Whitehead Island and **Sprucehead Island,** 0.8 mile northward.

A causeway and fixed bridge connecting **Elwell Point** with Sprucehead Island has a clearance of 8 feet. The harbor has depths of 18 to 39 feet, with soft bottom.

Spruce Head (P.O.), is a village on the north side of Seal Harbor. The harbor has several service wharves, two with float landings with from 6 to 17 feet alongside. Diesel oil, gasoline, water, ice, groceries, some ship chandlery and supplies, lodging, boat rental and charter boat hire are available. There is telephone communication. A beach suitable for launching small boats at high water is available.

A lobster wharf on the northeast side of Elwell Point has gasoline, ice, and water available but is dry at low water. The harbor is easy of access in daytime and the principal dangers are buoyed. **Seal Island** is about 500 yards northward of Whitehead Island Light and **Seal Island Ledge,** which bares almost 500 yards north of Seal Island, is the principal danger on the south side of the entrance. Buoys mark the east and northeast sides of the ledge. **Long Ledge,** 0.2 to 0.5 mile north of Whitehead Island shows in two places at high water.

Burnt Island, connected to Sprucehead Island by a private bridge, has a number of summer homes. Small craft use the passage between these two islands. Clearance of the bridge is 8 feet. **Burnt Island Ledge,** 150 yards south of Burnt Island and marked by a buoy,

has a depth of 2 feet. The approach to the wharves in Seal Harbor is reported to be clear. The chart is the guide.

Dix Island Harbor is an anchorage on the south side of Muscle Ridge Channel between Andrews, Birch, and Dix Islands. The harbor is entered from southwestward through a narrow and crooked channel leading between the ledges north of **Hewell (Hewett) Island,** 1.5 mile north of Two Bush Island. The channel and harbor are unsafe for strangers to enter.

On the west side of **The Neck,** just westward of Andrews Island, is a wharf with a depth of 2 feet alongside. There is a stone wharf, with good water reported alongside for small craft, on the west side of **High Island.** Care must be exercised in approaching it to clear a rock with 3 feet over it about 200 yards westward of the wharf. A good all-weather anchorage for small craft is reported between High, **Dix** and **Little Green Islands.**

Weskeag River empties into the western side of Muscle Ridge Channel at the head of the bight westward of **Ash Island,** a wooded island, about 3 miles northeast of Sprucehead Island. The channel between Ash Island and Ash Point is shoal and obstructed by fishweirs. **Lark Ledges,** dangerous unmarked ledges with two rocks awash at either end; **Grace Rock,** also unmarked, and a number of other unmarked rocky patches obstruct the approach to Weskeag River.

Spaulding Island, wooded, is about in the middle of the river entrance between **Otter Point** and **Thorndike Point.** There is a stone town wharf, with 2 feet at the head, on the west side, just inside the entrance abreast of Spaulding Island. There are no facilities. The river has a narrow, crooked unmarked channel, which is not safe for strangers.

The village of **South Thomaston** (P.O.) is at the head of navigation, 2 miles above its mouth; the greatest draft taken to the village is 9 feet at high water. Vessels seldom enter. The village has a general store where gasoline, fresh water, provisions, and some supplies can be obtained. There is a small boatyard and marine railway where craft up to 36 feet in length and 4-foot draft are built, or hauled out for hull or engine repairs or dry open winter storage. There is telephone communication and good roads to the interior. Local knowledge is advisable for entering and anchoring.

Fisherman Island Passage leads from Muscle Ridge Channel to Penobscot Bay, between Fisherman Island and Sheep Island. Several dangers are in this passage, but the principal ones are marked by buoys and can be easily avoided in the daytime in clear weather.

Chart 209.—Owls Head Bay is between Sheep and Monroe Islands, about 6.5 miles north-northeastward of Two Bush Island, on the east and the mainland on the west. The bay is a continuation of Muscle Ridge Channel northward of Fisherman Island Passage. The channel through Owls Head Bay is very narrow on the western side of Sheep Island, where it is marked by two buoys. Vessels can anchor in the middle of the bay abreast Monroe Island in depths of 42 to 69 feet.

Small vessels can anchor in the entrance to **Owls Head Harbor,** on the west side of the bay, between **Dodge Point** and the bare ledge southwestward, in depths of 9 to 24 feet. A fish wharf in the harbor bares at low water. Gasoline is available. Well water can be obtained nearby and ice, provisions and some supplies can be obtained at a general store in the village of **Owls Head** (P.O.). There is a good firm beach where small boats may be launched from trailers at any stage of tide. There is telephone communication and good roads to the interior.

Owls Head is a prominent headland at the northeast entrance to Owls Head Bay and the south side of the entrance to Rockland Harbor. **Owls Head Light (44° 05.5′ N., 69°02.7′ W.),** 100 feet above the water and visible 16 miles, is shown from a white tower on the headland; a fog signal is at the light. In 1958, it was reported that dead zones existed to the northeastward and also south-southwestward in Owls Head Bay in which the fog signal is not heard. The light is obscured from 324° to 354° by Monroe Island. See Appendix for **storm warning** displays.

Emery Island is a small islet 0.8 mile west and on the opposite side of the channel from Sheep Island. A rock 350 yards eastward of Emery Island is bare at low water; a daybeacon marks the rock. **Dodge Point Ledge,** eastward of Dodge Point and bare at half tide, is marked by a daybeacon. **Owls Head Ledge,** southeastward of Owls Head and bare at low water, is marked by a buoy.

Monroe Island Light (44°04.8′ N., 69°02.0′W.), 32 feet above water and visible 9 miles, is shown from a white skeleton tower on the east side of Monroe Island. In West Penobscot Bay, eastward of Monroe Island, the **tidal current** has a velocity of about 0.5 knot at strength. See the Tidal Current Tables for predictions.

A **measured nautical mile** on bearing 180°32′ is eastward of Monroe Island; buoys and shore ranges mark the ends of the course. The course is about 7 miles long and vessels must keep clear while trials are in progress.

Rockland Harbor, one of the most important harbors in Penobscot Bay, is on the west shore of West Penobscot Bay between Owls Head on the south and **Jameson Point,** 2.1 miles northwestward, on the north. The harbor offers anchorage for the largest vessels, but is somewhat exposed to easterly winds. Northeasterly winds raise a heavy sea in the southwestern part of the harbor, but shelter may be found behind the breakwater.

The breakwater, about 4 feet above high water, extends 0.7 mile in a southerly direction from Jameson Point. **Rockland Breakwater Light (44°06.2′ N., 69°04.7′ W.),** 39 feet above the water and visible 11 miles, is shown from a white square tower; a fog signal is at the light.

The principal dangers in the harbor are marked and it is easy of access both day and night.

Rockland (P.O.), a city on the western shore of the harbor, has some trade by water in lime, coal, fish, and petroleum products. Diesel-powered mail, freight, automobile and passenger ferries leave the Port District Terminal in **Lermond Cove** daily for North Haven, Vinalhaven, Matinicus, and Criehaven.

Seaplanes can be chartered for trips to the several towns in the bay. The town is a terminus of a branch of the Maine Central Railroad which connects with the main line at Brunswick. A Coast Guard station is located on Tilsons Wharf. See Appendix for **storm warning** displays.

The most prominent objects in approaching Rockland Harbor are the radio tower of Station **WRKD**, which is lighted at night, Rockland Airport Aeronautical Light, the high elevated tank, and the large yellow hotel on Jameson Point. The light on Owls Head and the light at the end of the breakwater are also conspicuous. The two high cement chimneys of the cement works between Rockland and Thomaston are very prominent from off Rockland Harbor.

Channels.—A Federal project provides for an approach channel 18 feet deep and three branch channels 14 feet deep, each with turning basin, leading to the northwestern, western and southwestern parts of the waterfront. In 1958 the controlling depth in the approach channel was 18 feet. In 1957, the controlling depth in the northern branch channel was 9 feet; in the western 12 feet; and in the southwestern 11 feet. In 1959 removal of ledges in the channels to project depth was in progress. A 13-foot channel leads directly to the coal wharf in the northwestern part of the harbor. All channels are buoyed.

Anchorages. There are three prescribed anchorages in the harbor; limits and regulations are given in **§ 202.130**, Chapter 2. Standing westward in the harbor the water shoals gradually toward the wharves. The small craft anchorage is in the southwestern part of the harbor off the municipal landing.

Several rocks and ledges are in the harbor. The visible ones are **Shag Rock**, a cluster of bare rocks, which has a daybeacon on them; **Lowell Ledge**, a cluster of rocks bare at low water on the south shore of the harbor opposite Jameson Point; and **Seal Ledge**, bare at half tide in the southwest end of the bay and marked by a daybeacon. A buoy marks **Spears Rock**, with 5 feet over it, about 300 yards northeastward of Lowell Ledge. A wreck, bare at mean low water, is about 200 yards southwest of Seal Ledge.

Approaching Rockland Harbor, Rockland Breakwater Light may be steered for on any safe course, using the chart as a guide. Enter the harbor southward of the breakwater light, giving it a berth of 100 yards or more.

Tide. The mean range of tide is about 9.7 feet.

Pilotage is not compulsory, or necessary at Rockland. Pilots for Penobscot Bay and River may be obtained at Rockland, Belfast, Camden, or Bucksport. They will meet vessels off Port Clyde, Monhegan or Mosquito Islands, or off Rockland Harbor, as requested, on prior notice of 36 hours or more.

A small motor launch, used for **towing** barges, is available at Rockland and three modern **tugs** are available at all times at Belfast.

Rockland is a **customs port of entry** and marine documents are issued. The harbormaster may be reached through the Snow Marine Basin.

A municipal pier and float landing in the southwestern part of the harbor, has a depth of 6 feet alongside. There are restrooms, telephones, an information booth, and parking at the landing; water is piped to the float. A locally maintained lighted range leads to the landing; its lights are visible 1 mile.

The Rockland Port District Terminal Wharf in Lermond Cove is the ferry landing. The wharf is 260 feet long and has a ferry slip, a lift bridge, gallows frame, and ramp. In December 1958 there was a depth of 11 feet alongside. Rest rooms are available in the terminal building.

In 1958 the following depths were reported at some of the wharves: **Tilsons Wharf**, 15 to 18 feet; oil dock with prominent tanks, 12 feet; coal wharf with unloader, 18 feet alongside, 13 feet in the approach channel and turning basin; shipyard, on **Atlantic Point**, 14 feet at head, 8 to 11 feet on each side; old railroad wharf, which in 1958 was in disrepair, 10 to 15 feet: other wharves had 4 to 12 feet.

Visiting craft can be serviced alongside most of the wharves. Provisions, water, ice, gasoline, oil, diesel oil, coal, bottled gas, ship chandlery, and yacht supplies can be obtained in the port. There are several boatyards with marine railways. Craft up to 100 feet in length and 10-foot draft can be hauled out for hull or engine repairs; electric and electronic repairs can be obtained.

A commercial fishing corporation has two repair yards with marine railways, the largest of which on Atlantic Point, can haul out vessels up to 240 feet in length, 40-foot beam, and 1,500 ton displacement and 15-foot draft. The yard has a 50-ton crane and several smaller ones. The nearest port where large vessels can be drydocked is Boston.

Clam Cove, on the west side of West Penobscot Bay, about 2 miles northward of Rockland Harbor, is shoal at the head, and is not a good anchorage. The ruins of a stone wharf is on the north side of **Brewster Point**, 1.2 miles north of Jameson Point. **Glen Cove** (P.O.) is a village near the head of the cove.

Brewster Point Ledge, extending over 700 yards southeastward from Brewster Point on the south side of the entrance, is covered at its highest point at high water; a buoy is southeastward of the ledge.

Ram Islet is a grass-covered rock 400 yards northeastward of Brewster Point. The shoal that extends northeastward from the islet is marked by a buoy.

Rockport Harbor, on the west side of West Penobscot Bay about 4 miles northward of Rockland Harbor, is a good anchorage for vessels of any size, sheltered from all but southerly winds, and is easy of access. Vessels can anchor anywhere between the entrance and a point 1 mile southward of the head, in depths of 42 to 63 feet, soft bottom. Small vessels and motorboats can find anchorage nearer the head.

The head of the harbor to the entrances of the two coves near the head has been dredged to a depth of 12 feet, but considerable shoaling off the mouth of the river was reported in 1958. A public float landing with a depth of 3 feet is maintained by the town of **Rockport** (P.O.) at the east side of the entrance to Goose River,

at the head of the harbor. The Rockport Yacht Club also maintains a float landing with 3 feet alongside. Restrooms and telephone are available and water is piped to the wharf.

There are no other facilities at the town wharf. Gasoline and diesel oil may be obtained in the town. The nearest waterfront service facilities are at Camden. Provisions, ice, and some ship chandlery are available in the town. There is a small marine railway that can haul out craft up to 30 feet in length and 4-foot draft for minor hull repairs. Covered and open winter storage is available at the yard.

A boat building yard is on the west side of the harbor. The wharf of the fish factory, which was not in operation in 1959, on the west side of the river entrance, has 10 feet alongside. The town has a library, market, and drug store. Bus service is available, locally to Rockland, and through service to Boston, or the east. There are a few private piers with float landings; there is also a public park with picnic area and swimming beach on the west side of the harbor southward of the boatyard.

Porterfield Ledge, in the middle of the entrance to Rockport Harbor is bare several feet at low water; a daybeacon is on the ledge. **Indian Island,** on the eastern side of the entrance, is grassy and marked at its south end by an abandoned lighthouse. **Lowell Rock,** 200 yards south of Indian Island, is bare. **Lowell Rock Light,** 25 feet above the water, visible 4 miles, and shown from a red spindle, on the south end of the rock, marks the entrance to the harbor.

Vessels can enter Rockport Harbor on either side of Porterfield Ledge Daybeacon, giving the daybeacon a berth of at least 150 yards. A fairway bell buoy is off the entrance between Porterfield Ledge and Lowell Rock. When in the harbor stand northward in midharbor until 0.3 mile from the head, then slightly favor the eastern side.

Beauchamp Point is the eastern point of Rockport Harbor, north of Indian Island. Passage is sometimes made by local small craft at high water across the ledge between Indian Island and Beauchamp Point. **Seal Ledge,** bare at low water and marked by a daybeacon, is on the east side of Rockport Harbor about 0.4 mile north of Beauchamp Point. A pier, two marine railways, and a large boatshed, all private, are in the cove, east of Seal Ledge.

Deadman Point is about 0.4 mile northeast of Indian Island. **Hog Cove,** on the north side of Deadman Point has two private piers with float landings. **Hog Cove Ledge** extends about 0.3 mile above Deadman Point and forms the eastern side of the cove. **Goose Rock** is a bare ledge about 0.2 mile north of Hog Cove Ledge.

The Graves, about 1 mile offshore, midway between the entrance to Rockport and Camden Harbors, is a ledge showing bare rocky heads at high water and a large area bare at low water. **The Graves Light (44°10.9′ N., 69°02.1′ W.),** 26 feet above the water and visible 8 miles, is shown from a white skeleton tower on the rocks. A bell buoy is just eastward of The Graves.

Camden Harbor, on the west side of West Penobscot Bay about 6 miles north of Rockland Harbor, is the approach to the town of Camden. The harbor is frequented by many yachts and small craft. The **outer harbor** is easy of access and affords good anchorage in depths of 13 to 33 feet, soft bottom. The **anchorage** is eastward of a line from Eaton Point to the buoy northward of Curtis Island. The **depths** in the outer harbor shoal gradually northward to a depth of 12 feet about 500 yards from the head of **Sherman Cove,** in the northern part of Camden Harbor. Above the 12-foot curve the cove is shoal.

The greater part of the **inner harbor** west of Eaton Point is occupied by small pleasure and fishing craft. There are numerous private moorings. In 1958 the depths in the inner harbor were reported to be from 3 to 10 feet with considerable shoaling at the head. The depths along the wharves range from 2 to 6 feet, and float landings are used at some to obtain adequate depths for small craft. The depth along the fitting-out pier of the shipyard on the east side was reported to be 16 feet in 1958. A shoal extends 80 yards from the north shore off Eaton Point and the shipyard at the entrance of the inner harbor.

The most conspicuous feature seen in entering Camden Harbor is **Mount Battie,** 800 feet high. A small stone memorial tower has been erected on the summit which shows as a long ridge from off the harbor.

Curtis Island, on the southern side of the entrance is prominent. **Curtis Island Light (44°12.1′ N., 69°03.0′ W.),** 52 feet above the water and visible 13 miles, is shown from a white tower on the southeast end of the island; a fog signal is at the light. The passage between Curtis Island and **Dillingham (Metcalf) Point** is shoal and foul. Rocks awash are about 110 yards southwest of the light and about 150 yards northwestward of the island.

Northeast Point, on the northeast side of the entrance, is marked off its south side by **Northeast Point Light (44°12.5′ N., 69°02.8′ W.),** 20 feet above the water and visible 6 miles, shown from a red skeleton tower.

Northeast Ledge, consisting of **Inner** and **Outer Ledges,** is southward of Northeast Point, and constricts the main entrance to Camden Harbor to a width of about 400 yards. The higher parts of Inner and Outer Ledges are bare at half tide. A buoy off the south end of Outer Ledges, and another buoy off the southwest end of Inner Ledges, mark the main entrance southward of the ledges. A buoy northward of Outer Ledges and a daybeacon on Inner Ledges mark the passage north of the ledges. **Dillingham Ledge,** having a buoy off its east side, is 0.5 mile offshore and 1.3 miles northeast of Camden Harbor.

Northeast Passage is a narrow channel, with depths of 12 to 19 feet, leading into Camden Harbor between Northeast Point and Inner Ledges. The deeper water favors the light off Northeast Point. A fairway bell buoy is 0.3 mile northeastward of the entrance. This channel is used by local vessels but should be used with great caution by strangers.

Entering Camden Harbor by the main channel, vessels can steer for Curtis Island Light on any safe course, taking care to avoid The Graves. Pass 200 to 300 yards

eastward of Curtis Island and select anchorage in the outer harbor, eastward of a line joining Eaton Point and the buoy northward of Curtis Island. If going to the inner harbor, pass 100 yards northeastward of the buoy and steer for the entrance of the inner harbor, passing southwestward of the shoal on the north side at the entrance to the inner harbor, and haul northward in midharbor.

To enter by Northeast Channel, from the fairway bell buoy steer for the north end of Curtis Island until close to the buoy at the northerly end of Outer Ledges. Pass northward of this buoy and steer westward between Northeast Point Light and Inner Ledges Daybeacon, favoring the light.

Ice sometimes forms in the harbor from January to March, but is not dangerous for vessels in the outer harbor. Westerly winds clear the harbor of ice if it is broken up.

Camden (P.O.), the town on the inner harbor, is an important yachting center. The nearest railway point is Rockland. The old steamer wharf on Eaton Point was condemned and burned in 1959. Several excursion schooners operate on coastal sailing cruises along the Maine coast from Camden during the summer months. The Camden Yacht Club Wharf is on the western side of the inner harbor. The four-float landing with 4 to 6 feet alongside has water piped to it. Showers, restrooms, buffet and clubrooms are available at the club, and guest moorings are maintained in the outer harbor. The town has a **harbormaster** who can be reached at the yacht club.

There are a number of service wharves on the west side of the inner harbor which have float landings with 6 to 8 feet alongside. Gasoline, diesel oil, water, provisions, ice, marine hardware, fishing tackle and bait can be obtained. A service wharf on the west side is equipped with showers, and restrooms. Laundromat service is available on the waterfront. Ship chandlery is available.

There are several boatyards on the west side of the inner harbor where craft up to 45 feet can be hauled out for hull and engine repairs or winter open or covered storage. Electric and electronic repairs can be made; overnight berthing space and wharfage with electricity are available at several of the service wharves.

A shipyard on Eaton Point has two marine railways, the larger of which can haul out craft up to 100 feet in length, 10-foot draft, and 200 tons, for hull and engine repairs; open and covered winter storage are available to a capacity of 150 boats. The yard has a 20-ton and a 5-ton crane. It can build (under cover) craft up to 100 feet in length, and of unlimited size on outside building ways. The yard has berthing space with 110 to 220 volt a/c current and telephone available, and has complete machine, welding, and plumbing shops. Diesel oil, water, restrooms, showers, laundromat, snack bar, parking, and ship chandlery are available at the yard.

There are bus and telephone communications. There is a public park and picnic area. Swimming, boat rental, parking, country club, churches, hospital, restaurant, and markets are available in the town.

Chart 310.—Mount Megunticook, 1,380 feet high, is 2 miles northward from Camden. The mountain shows as a flat-topped peak with a steep shoulder on its southern side.

Duck Trap Harbor is a broad, open bight in the west shore of West Penobscot Bay, 5 miles northeastward of Camden Harbor. Good anchorage, sheltered from northerly and westerly winds, will be found about 600 yards from the north shore of the harbor, in depths of 31 to 43 feet, bottom soft in places. **Haddock Ledge,** the only outlying danger, is a rock with 4 feet over it about 0.6 mile from the western shore and the same distance southwestward of **Spruce Head,** the northeast point of the harbor. A buoy is on the southwest side of the ledge. With this exception, danger will be avoided by giving the shore of the harbor a berth of about 500 yards.

Lincolnville (P.O.) is a village at southwest end of Duck Trap Harbor. An automobile ferry operates between Lincolnville and Grindel Point, Gilkey Harbor. The ferry wharf and shed are prominent from offshore. A church with a white spire, 0.5 mile northward of Lincolnville, is conspicuous from the bay. The viaduct of the main highway where it crosses the valley at the head of the harbor, is very conspicuous.

Great Spruce Head, 2 miles northward of Spruce Head, is bold.

Saturday Cove is a small cove on the west side of West Penobscot Bay, 9 miles northeastward of Camden Harbor. The village of **Northport** is on the south side of the cove. Private float landings are usually maintained near the entrance.

Chart 311.—Temple Heights is a small summer settlement on the western shore of the northern end of Penobscot Bay, about 0.5 mile north of Saturday Cove.

Northport Camp Ground (Bayside P.O.) is a summer settlement on the west side of West Penobscot Bay 2.5 miles northward of Temple Heights. A water tank on the hill back of the village is prominent. The wharf has a float landing maintained by the Northport Yacht Club. There is reported to be a depth of 16 feet of water at the head of the dock. Water is piped to the wharf and gasoline, oil, provisions, and some supplies are obtainable in the village. The **Main Sailing School** is located here.

Chart 208.—Belfast Bay and **Passagassawakeag River** empty into the head of Penobscot Bay from northwestward and form the approach to the town of Belfast and village of Citypoint, about 2 miles above Belfast. The bay affords good anchorage, exposed to southeasterly winds and is easy of access. The controlling depth is about 13 feet in the main channel to Belfast. The channel is marked by two buoys. The channel from Belfast to **Citypoint** is narrow, crooked, and unmarked, is bare at low water, and can be used by a draft of about 6 feet at high water. This channel is little used except by small craft.

Good **anchorage** can be had off the entrance to the river westward of Steels Ledge, in depths of 19 to 28 feet; also in the river below the old steamboat wharf,

in midchannel, or favoring the western shore, in depths of 11 to 16 feet, soft bottom. Above this wharf, shoals extend halfway across the harbor from the northeast side, and for a short distance below the bridge extend two-thirds of the distance across. Small vessels can anchor about 75 yards off the upper wharves of the city in depths of 10 to 22 feet.

Steels Ledge, on the north side of Belfast Bay, is an extensive ledge with a least depth of 1 foot, marked by **Steels Ledge Monument Light (44°25.2′ N., 68°58.4′ W.),** 20 feet above the water and visible 9 miles, shown from a white lantern on a gray, square stone structure on the southern end of the ledge. The light is most brilliant on the bearing 332°, diminishing around the remainder of the horizon. A bell bouy is southward of the light. The deep water between the ledge and the north shore should not be used as a channel because of shoal obstructions to the eastward.

Bridges.—The highway swing bridge of U.S. Route 1 crosses Passagassawakeag River at Belfast and has a clearance of 6 feet. The midchannel depth through the bridge is 9.5 feet. Arrangements for opening to permit passage through can be made by contacting the city manager at Belfast. In 1959, the fixed Nickerson Bridge, about 0.8 mile upstream, was in disrepair and closed to traffic. It was reported condemned and to be removed. Clearance through this bridge at midchannel was 9 feet. About 3 miles above its mouth, Passagassawakeag River is crossed by two fixed bridges having clearances of 7 feet. The lower of these two was a railroad spur bridge and the upper a highway bridge.

Vessels entering Belfast Bay can shape the course to pass anywhere between the bell bouy southward of Steels Ledge and the western shore, then head north-northwestward in midchannel.

The mean range of the **tide** at Belfast is about 10 feet. Ice obstructs navigation throughout the river and bay in severe winters. The bay has been frozen over to Long Island. During an average winter the harbor is frozen during February.

Belfast (P.O.) a city on the southwest side of Passagassawakeag River at the mouth, has several shoe and clothing factories, food canneries, and fish and poultry packing plants. It is a **customs port of entry** and marine documents are issued. In 1958 only the Belfast Packing Company and Eastern Maine Towage Company wharves were in general use. The former had depths of 7 to 8 feet alongside with shoaling to 1.5 feet on its eastern side; the latter was reported to have 15 feet alongside. It is the principal wharf, and supplies and water can be obtained at it. Diesel oil and gasoline can be obtained from tank truck.

The remainder of the wharves were in ruins, including the old steamer wharf, which was reported condemned. The former Oak Hill Granite Company wharf was being rebuilt as a town wharf and had a float landing with 9 to 12 feet alongside. Gasoline is obtainable at the float.

There are no marine railways, and only minor engine repairs can be obtained at Belfast. There are three modern towboats available at all times. Ice, ship chandlery, and most supplies can be obtained at the port. The Belfast and Moosehead Lake Railroad Company has a terminal at Belfast.

Chart 311.—Searsport Harbor, at the head of Penobscot Bay about 4 miles east of Belfast, is a broad bight open to the southward. The town of **Searsport** (P.O.) is at the head of the harbor. The commercial development of the harbor is at **Mack Point,** 1 mile east of Searsport, where the coal unloading plant and the numerous oil tanks on the point are conspicuous. There is considerable traffic in coal, oil, sulphur, potatoes, fertilizer, paper, scrap iron, and some granite. Good anchorage, used by all classes of vessels may be had in depths of 18 to 32 feet, soft bottom, sheltered from northerly winds.

Dangers.—Long Cove Ledge, awash near its southern end at lowest tides, is 400 to 800 yards south of the west end of Mack Point. A lighted bell buoy is off the southeast side of the ledge, and a buoy is off the southwest side. In 1958 shoaling to 30 feet was reported close eastward of the lighted bell buoy, and the controlling depth to the piers was limited to 23 feet.

The approach to Mack Point piers is between Sears Island and the lighted bell buoy off the southeast side of the ledge. Ledges make off 0.3 mile from the western shore of the southern half of Sears Island; one of these ledges, **Sears Island Ledge,** is bare at low water. A bell buoy is nearly 0.5 mile southwest of Sears Island and at the south end of the ledge. Two other buoys mark the limit of the ledge westward of the island.

Pilotage is not compulsory, but is advisable for deep-draft vessels. Pilots are available at Belfast, Camden, or Bucksport. They will meet vessels off Monhegan or Mosquito Islands, Rockland, or Belfast as requested on 36 hours prior notice. Three tugs are available at Belfast.

Quarantine, Customs, and Immigration.—The port of entry is Belfast; the Immigration Office is at Bangor. Preliminary entry for quarantine, immigration, and customs are usually handled by the customs boarding officer on arrival at the dock.

Terminal facilities.—There are four usable wharves on Mack Point; a fifth one, a former fertilizer wharf is in disrepair and the plant dismantled. The fertilizer wharf near the southwestern end of the point has 14 feet along its eastern side at the outer end. Searsport Terminal, the railroad wharf, and the coal and oil wharf are on the southeastern end of Mack Point. In 1958 the terminal wharf was reported to have 32 feet on its eastern side at the outer berth and spots of 24 feet on the inner berth. On its western side there is reported to be a depth of 30 feet. The coal and oil dock was reported to have 35 feet on its eastern side and 20 feet on its western side. The terminal pier has warehouses and conveyors, and towers for handling bagged cargoes, the coal and oil pier, modern coal unloading equipment and oil pipeline connections. An oil discharging berth is on the eastern side of the point close northward of the terminal pier.

At Searsport there is a town landing with 5 feet reported alongside the float. There are no facilities at the landing.

Supplies.—Coal and oil in large quantities are available. Gasoline, provisions, ice, and some supplies can be obtained at Searsport. Deck and engine stores can be obtained from Belfast and delivered to the wharves. Ordinary voyage repairs can be handled by a firm in Rockland.

Long Cove is eastward of Searsport Harbor, between the northwestern shore of Sears Island and Mack Point. The greater part of the cove is shoal, but good anchorage can be selected just inside the entrance in depths of 10 to 24 feet, sheltered from all but southwesterly winds.

Sears Island, eastward of Searsport Harbor and on the western side of Stockton Harbor, at the entrance, is high and thickly wooded. A small clearing is on the south end of the island. Sears Island is joined to the mainland by a sand bar which dries at low water.

Cape Jellison is 0.5 mile east of Sears Island and forms the eastern shore of Stockton Harbor. A ledge, the outer part bare at half tide, extends 0.4 mile southward from **Squaw Point,** the southern extremity of Cape Jellison and on the eastern side of Stockton Harbor at the entrance. The ledge has a wooded islet in the middle and is marked by a buoy off its southern end. A buoy is off the shoal making westward from Cape Jellison.

Stockton Harbor is between Cape Jellison and Sears Island, westward of the entrance to Penobscot River. It is a secure harbor for vessels of about 22-foot draft or less, and is easy of access. The depths shoal gradually from about 22 feet at its southern end to 9 feet about 0.3 mile above the ruins of the old wharves on the east side. Above this the harbor is shoal. The lead is a good guide.

Stockton Springs (P.O.) is a village at the head of the harbor. The old wharf is in ruins. The extensive wharves on the western side of Cape Jellison are in ruins.

On **Kidder Point,** on the western side of the harbor, is a chemical plant and wharf. In 1958, shipments to and from the plant were by rail, as the wharf, with 10 feet at the head, was in disrepair. The wreck of a barge lies off the east side of the pier some distance inshore from the head. The red brick stack and buildings of the plant are conspicuous.

To enter Stockton Harbor make the lighted gong buoy about 0.7 mile southward of Sears Island, then head up to pass 300 yards eastward of the buoy off the southeast end of the island; thence passing in midchannel through the entrance and westward of the buoys off Cape Jellison.

Anchorage can be selected as desired and as charted depths indicate.

Bagaduce River empties into the eastern side of East Penobscot Bay near its head. The river is the approach to the town of Castine, on the north side just inside the entrance, and to several smaller settlements farther up. The entrance, **Castine Harbor,** has ample depth and is easily entered. There is no commerce by water and some fishing and much yachting. **Dice Head Light (44°22.9′ N., 68°49.2′ W.),** 27 feet above the water and visible 10 miles, is shown from a white skeleton steel tower on the point on the north side of the entrance. The white stone circular tower of the abandoned lighthouse above the light on Dice Head is very conspicuous.

The channel in the river for 5 miles above Castine Harbor is buoyed and is used by small craft. However, the channel is narrow and so constricted by rocks in places that navigation is possible at slack water only, on account of the current. It is unsafe for strangers above the narrows.

Small craft anchor off the town eastward of the float landings, where there are a number of moorings, but the best anchorage is reported to be in **Smith Cove,** southeastward of Castine Harbor. The cove has depths of 19 to 58 feet, soft bottom and shelter can be found there in all winds.

Another small-craft anchorage is in what is locally known as **Hospital Cove** between **Nautilus, Holbrook,** and **Ram Islands** and the northern extremity of Cape Rosier. This cove can be entered from the westward through the channel between Nautilus Island and Holbrook Island. **Nautilus Rock** in the middle of the entrance is marked by a buoy. The southwesterly channel, between Ram and Holbrook Islands, and Cape Rosier, is unmarked and more difficult. **Anchorage,** secure in all weathers, can be had in good holding ground in 13 to 37 feet in the westerly half of the cove.

Henry Point is on the east side of the approach to Smith Cove. Dangers to be avoided in the cove are the middleground ledge, bare at low water, about 0.5 mile south of Henry Point, and a sunken rock with a depth of 3 feet over it, 300 yards west of **Sheep Island,** near the southern part of the cove. The holding ground abreast Castine is not good, and the general depth is about 72 feet.

Craft in entering Castine Harbor will find the eastern shore northward and southward of the entrance is bold, and can be followed at a distance of 0.3 mile. There is a fairway bell buoy in the entrance. Pass close to this buoy on either side, and keeping a reasonable distance offshore and south of the buoy marking **Otter Rock Shoal,** steer into the harbor on a midchannel course. By close attention to the chart, anchorage can be found in Smith Cove about 200 to 500 yards south of Henry Point, or for small craft south of Sheep Island near the head of the cove.

The mean range of the tide is about 10 feet from Castine to the head. The river is usually free from ice at Castine and for some distance above, but in very severe winters the river is entirely closed.

Castine (P.O.) is an important summer resort situated 1 mile eastward of Dice Head Light. The locality is of historical interest, and there are many tablets about the town marking spots of special interest.

The **Maine Maritime Academy** is at Castine. The academy maintains an excellent wharf with 26 feet alongside at which the large training vessel moors. There

are service wharves with float landings with 5 to 12 feet alongside where gasoline, oil, diesel oil, ice, water, and yacht supplies are obtainable. Provisions and ship chandlery are available in the town. There is a town wharf with float landing with 12 feet and Castine Yacht Club landing with 8 feet alongside the float. The stone foundation of an old stone pier is close to the eastward end of the yacht club float, and care should be taken to avoid it in coming alongside.

A marina, with 12 feet alongside the floats, close eastward of the town wharf, has all services available, including restrooms, showers, laundromats, restaurant, and supplies. Row boats and outboards can be hired there, and charter boat hire is available. Party fishing boats operate from the wharves from early spring to late fall. There are several boatyards where craft up to 45 feet in length and 8-foot draft can be built or hauled out for hull or engine repairs or dry covered or open winter storage. There is a ramp where boats can be launched from trailers. The town has restaurants, guest houses, drug store, telephone, telegraph communication and other conveniences.

West Brooksville (P.O.) is a village on the south side of the river 1.5 miles above Castine Harbor, and **North Castine** (P.O.) is a village on the north side 2 miles above the harbor.

North Brooksville (P.O.) is a village on the southern branch of Bagaduce River, about 6 miles above Castine. At high water, small boats sometimes go to the bridge crossing the river at the village, but the channel is unmarked and unsafe for strangers.

Penobscot (P.O.) is a village on **Northern Bay** at the head of navigation on the north branch of Bagaduce River, 6.5 miles above Castine. The approach to the village is bare at low water.

Penobscot River, emptying into the head of Penobscot Bay, forms the approach to the towns of Bucksport, Winterport, and the city of Bangor, the latter situated at the head of navigation about 24 miles above Fort Point Light at the entrance. The deepest draft ordinarily trading to Bangor is about 18 feet.

A Federal project provides for the dredging to a depth of 22 feet between Winterport and Bucksport; for the straightening, widening, and deepening of the channel to a depth of 15 feet near Stearns Mill and Crosbys Narrows, about 4 miles below Bangor; and for deepening the harbor at Bangor to a depth of 14 feet. The controlling depths in 1959 were 20 feet between Bucksport and Winterport, thence 15 feet to Stearns Mill, and thence about 14 feet to Bangor.

The most difficult sections for steamers are off Lawrence and Luce Coves where it is difficult to mark the best water and off Frankfort Flats where large steamers experience difficulty with the sharp turns.

The channel in Penobscot River is crooked and narrow in places and frequent changes occur. Strangers should not attempt to carry drafts greater than 10 feet to Bangor; care and use of the lead are necessary in any case. With a deeper draft a pilot or towboat should be used; 23 feet is carried to Bangor and Brewer at high water, and deeper drafts occasionally to the paper mill and oil berth at South Brewer. The safest time is on a rising tide. The river is not safe, and seldom is run by anyone at night. The preceding paragraphs describing the river give the simplest directions by pointing out the difficulties and the dangers and especially the need for local knowledge. The chart and the aids must be carefully followed.

The usual anchorage for vessels waiting at the river entrance for a towboat or favorable wind and tide is northward of Fort Point on the west side of the channel. Vessels bound up the river anchor anywhere in the channel where soft bottom is found. Vessels towing to Bangor, if the tide does not serve, often anchor off Winterport. On account of the strong ebb current, it is better for vessels going to Bangor, particularly large ones, to anchor off Fort Point and start up the river about 3 hours after low water.

The mean range of the **tide** varies from about 10.3 feet at the entrance to 13.1 feet at Bangor. **Freshets** occur in the river during March and April; at times they are dangerous to vessels. **Ice** obstructs navigation above Winterport for nearly five months each year, beginning about December. During extreme winters the river is closed to the mouth. The most difficult place below Winterport is abreast Fort Knox, where ice jams occur. If vessels can pass this point they usually can go to Winterport. The river is usually opened up in March by an ice breaker which prevents much of the damage that might otherwise be caused by ice and freshets. However, in recent years, according to local information, there has been very little ice, and the river has seldom frozen over below Bangor. The brackish water formed by tidal action, and the river current no doubt have contributed to this.

Pilotage is not compulsory. Pilots for Penobscot River may be had off the south end of Verona Island, just above the mouth of the river, by making a flag signal. Penobscot Bay Pilots are available at Camden, Belfast, and Bucksport. They will board at Port Clyde, Monhegan or Mosquito Island, or at Rockland, as requested.

Towboats are customarily taken by large vessels bound up the river. There are three tugs available at Belfast.

Fort Point, on the west side at the entrance to Penobscot River, is partly wooded. **Fort Point Light (44°28.0′ N., 68°48.7′ W.),** 88 feet above the water and visible 15 miles, is shown from a white square tower connected to a dwelling on the point; a fog signal is at the light. There are several houses farther back on the north side of the point.

Fort Point Ledge, 0.3 to 0.6 mile southward of Fort Point Light, is bare at half tide. A daybeacon on a gray pyramidal stone pier is near the north end of the ledge.

Morse Cove, on the east side at the entrance to the river, is sometimes used by pleasure boats for temporary anchorage in depths of 8 to 18 feet, soft bottom.

Fort Point Cove, on the west side of the river northward of Fort Point, is used frequently as an anchorage. The depths are from 23 to 5 feet, shoaling gradually westward.

About 2.5 miles above Fort Point Light, Penobscot River is divided by **Verona Island** into two channels. The principal channel is on the west side of the island and the **Eastern Channel (Eastern River)** is on the east side. The channels unite north of Verona Island at the town of Bucksport.

Orland River, flowing into Eastern Channel from a northeasterly direction, is a shallow stream navigable for small boats and fishermen at high water to the dam at the village of **Orland** (P.O.), about 2.2 miles above the mouth. The channel is crooked, unmarked, and bare at low water a little below Orland.

Sandypoint (P.O.) is a village on the west bank of the river about 1 mile above **Sandy Point,** the northern entrance of Fort Point Cove. About 0.5 mile northward of Sandy Point there is a large fertilizer plant with a T-head wharf built out to deep water. The face of the wharf in 1958 was reported to have a depth of 30 feet on the north end and 14 feet on the south end. A large overhead conveyor on the pier is conspicuous.

Odom Ledge, in the middle of the main channel 2.7 miles above Fort Point is marked by a daybeacon on a square stone base on the highest point of the ledge, and a buoy off the southwest side.

Verona Park is a small summer settlement on the west side of Verona Island about 1 mile below Bucksport.

The river is crossed by a fixed highway bridge, about 0.8 mile below the town of Bucksport. The bridge has a clearance of 135 feet. The overhead power cable that crosses the river just above Bucksport has a minimum permit clearance of 145 feet. A fixed highway bridge crosses Eastern Channel eastward of the wharves at Bucksport. The center span has a clearance of 17 feet. Only small-boat traffic operates in Eastern Channel. An overhead power cable crossing the channel close eastward of the bridge has a permit clearance of 42 feet.

Bucksport (P.O.), a town on the east bank of the river 6.5 miles above Fort Point, is the terminus of a branch line of the Maine Central Railroad. Paper manufacture and oil distribution are the principal industries. The wharf of the paper mill located on the point just northwest of the town was reported to have a depth of 20 feet in 1958. It is used principally to load barges with paper. An occasional pulp shipment is discharged from ocean vessels. Pulpwood is discharged into a pool formed by log booms southeastward of the paper mill wharf.

A petroleum handling berth, consisting of 5 concrete pile clusters supporting a handling platform, extends from the old railway wharf to the log booms and provides a 700-foot berth for tankers of 35-foot draft. In 1959 the berth had a depth of 34 feet. The old steamship wharf is in ruins, and the other smaller wharves have disappeared with only broken piling and stone foundations remaining.

At the eastern end of town at the north end of the fixed bridge over Eastern Channel there is a float landing with 2 feet alongside, and also a ramp. Gasoline and water are available at the landing. A market at the landing can supply provisions, ice, yacht supplies, and ship chandlery. There are hotels and restaurants in the town, and a motel and picnic area are in the vicinity. There are no marine railways.

Fort Knox, an abandoned fort of imposing appearances across the river from Bucksport, is now a National Park. **Prospect Ferry** is just above Fort Knox. Nothing remains of the old ferry landing but the stone foundation which is visible at low water.

Harriman Cove is on the east side of the river, 1.3 miles above Bucksport. A coal wharf with a depth of 18 feet is just south of the cove. It has a prominent high crane and a conveyor up the hill to the coal piles and a white cylindrical sulphur-storage tank.

Frankfort Flats, marked by buoys, are 3 miles above Bucksport. The channel crosses from the east side of the river to the west side at this point, and it is difficult to carry the best water. Frequent changes occur here, and large steamers experience difficulty making the sharp turns.

Marsh River is a shallow stream flowing into Penobscot River from a southerly direction. A depth of about 2 feet can be carried to a large granite works on the west bank of the river about 1 mile from the entrance. **Frankfort** (P.O.) is a small village on the north fork of the river. The channel is bare at low water and full of boulders a little below the village.

Winterport (P.O.) is a town on the west bank of the river, about 12 miles above Fort Point; it is at the head of winter navigation, as ice closes the river 10 to 12 miles below Bangor. The former upper potato wharf has a depth of 10 feet alongside. The sheds are now used for winter storage of yachts and small craft. A marine railway on the south side of the wharf can haul out for repairs or winter storage, craft up to 50 feet in length. The old wharf about 0.3 mile down river is in ruins. Some supplies and provisions can be obtained in the town, but there are no facilities on the waterfront to supply small craft with gasoline and oil.

Hampden (P.O.), a small town on the west bank of the river, is 19 miles above Fort Point. The village of **Orrington** (P.O.) is on the east bank opposite Hampden. **East Hampden,** on the west bank 2 miles below Bangor, has facilities for small tankers discharging oil.

A large pulp works at **South Brewer** (P.O.) on the east bank opposite East Hampden, has a wharf with depths alongside from 15 feet at the upper end to 19 feet at the lower end. Two high brick stacks are prominent from downriver. About 0.5 mile south of South Brewer is an oil berth with a depth of 23 feet alongside. Shoals are reported in the river below this point.

Brewer (P.O.), a town on the east bank of the river opposite Bangor, has three oil wharves, one with a reported depth of 15 feet alongside. There is a small marine railway capable of hauling out craft up to 40 feet in length for hull and engine repairs or winter covered or open storage. Electric and electronic repairs can be made.

Bangor is an important city on the west bank of the head of navigation. Two fixed highway bridges and a railroad bridge connect Bangor with Brewer. The lower

highway bridge has a clearance of 23 feet. The river between the two highway bridges is used only to moor small craft. There is no navigation above the bridges. A dam crosses the river 1 mile above the railroad bridge. The principal water traffic is in oil and pulpwood. Most of the river in front of the city has been dredged where necessary to obtain a depth of 14 feet. Considerable shoaling was reported in 1958 in some places in the Brewer side. The bottom is rocky and poor holding ground, and there are a few rocks with a little less than 14 feet over them.

Kenduskeag River empties into Penobscot River from westward at the north end of Bangor. A railway drawbridge across the river at the entrance has a swing span with a clearance of 6 feet. Just above it is a fixed highway bridge. There has been no navigation in the river of late years.

Bangor is a **customs port of entry** and marine documents are issued. The customs and immigration offices are in the Federal Building.

There are a number of oil wharves on the west bank with depths of from 10 to 14 feet reported alongside. Two coal wharves are in operation for storage, but little used from the water. The old steamship wharf, now the railroad wharf, has a reported depth of 23 feet alongside. The public float landing on the west side of the entrance to Kenduskeag River has a depth of 3 feet, but no facilities are available. Provisions and ship chandlery can be obtained in the town.

Chart 313.—The following is a description of the coast from Muscle Ridge Channel to Georges Islands. Muscle Ridge Channel and Seal Harbor have been described previously in this chapter.

Norton Island Ledges are 0.6 to 1.2 miles westward of Whitehead Island. A bare rock is near the middle of the south side of the ledge, and rocks bare at low water are 600 yards southeastward and southwestward of the bare rock.

Seavey Ledges, westward of Norton Island Ledges, have four rocks awash at high water. There is a depth of 5 feet north of the ledges marked by a buoy and another 5-foot depth, unmarked at the southern end of the ledges, about 300 yards southwestward of the southerly group of 3 bare rocks.

Wheeler Bay and **Clark Cove,** northward of Seavey Ledges are foul. There are several granite quarries in these coves, but the only one operating in 1958 was on the west side of Wheeler Bay. Depths at their wharves vary from 5 to 8 feet, but are little used by water. One at the head of Wheeler Bay has a float landing with 4 feet alongside. **Clark Island** (P.O.) is a village on the northwest side of Clark Cove, northward of **Clark Island.** There is an inactive granite quarry with stone wharf on Clark Island. The island is joined to the mainland by a causeway.

Makertown Cove on the east side of Wheeler Bay northeastward of **Calf Island** has four fish wharves and a float landing with 4 feet alongside. Gasoline and some provisions are available. The cove is difficult to enter without local knowledge.

Tenants Harbor, 3 miles westward of Whitehead Light, is an excellent anchorage frequently used as a harbor of refuge by small vessels, and is easy of access. **Southern Island,** on the southern side of the entrance, is marked on its east side by an abandoned lighthouse, a white tower connected to a dwelling. A lighted bell buoy is east of the island. **Northern Island** is on the north side of the entrance. There are general depths of from 12 to 25 feet in the harbor.

The **anchorage** with most swinging room in Tenants Harbor is halfway from the western ends of Northern and Southern Islands to the short stone pier on the north side. Small craft anchor more toward the head of the harbor. The bottom is mostly soft mud and good holding ground, and shoals gradually westward. The north side of the harbor eastward of the stone pier is clear, while westward of it are spots with depths of 4 to 9 feet. The south side of the harbor abreast the western point of Long Cove should be given a berth of 200 yards. The harbor is open eastward, and an easterly gale raises a choppy sea in the harbor, but vessels with good ground tackle can ride in safety. **Ice** often obstructs the harbor during February; during extremely cold weather it is sometimes frozen to Southern Island.

Vessels entering Tenants Harbor can pass midway between Southern and Northern Islands, and steer **268°** into the harbor, slightly favoring the northern side.

Tenants Harbor (P.O.), is a village on the northern shore near the head of the harbor. There are a number of wharves with float landings in the harbor with 6 to 8 feet alongside at which gasoline, diesel oil, water, ice, provisions, yacht supplies, and ship chandlery can be obtained. There are two boatyards with marine railways capable of hauling out craft up to 50 feet in length and 5-foot draft for hull and engine repairs; and for open or covered dry winter storage. Overnight berthing can be had at some of the wharves. A restaurant, market, and lodging are available in the village. There is telephone communication and a good road to Thomaston. A seaplane operates from the harbor, spotting fish.

Long Cove, making northward from the entrance to Tenants Harbor, has several stone quarries which were not in operation in 1958. A lobster pound and fish pier is on the west side of the cove. Several private float landings are in the cove.

The entrance to the cove is about 150 yards west of the southwestern end of Northern Island, between reefs partly bare at low water. A buoy marks the east side of the entrance to the cove. A bare rock is on the eastern part of the reef on the western side of the entrance.

Hart Ledge extends nearly 500 yards from shore 0.7 mile southward of Southern Island. A rock covered at high water, is near the northeast end of the ledge and another rock, bare at low water, is near its southwest end. A buoy is off the northeast side of the ledge.

Mosquito Harbor, 2.5 miles southwest of Southern Island and 1.8 miles eastward of Marshall Point Light, is

shoal and used by a few fishing boats. The landings bare at low water. **Martinsville** is a settlement at the head of the harbor. **Mosquito Head**, on the eastern side of the entrance, is high and wooded and looks like an island from a distance.

Mosquito Island, off the entrance to Mosquito Harbor, is wooded. The islets westward of Mosquito Island, including **Hay Ledge, The Brothers**, and **Gunning Rocks**, are rocky with grass on top. **Black Rock**, 0.6 mile southwest of Gunning Rocks, is bare. Hart Bar, extending 0.5 mile northward of **Hart Island**, 1.8 miles west of Mosquito Island, is partly bare at low water. There are many unmarked submerged ledges in this vicinity.

The passage south of Mosquito Island and north of these rocks and islands is part of the inside route used by many vessels drawing 12 feet or less. The principal dangers are buoyed, but there are unmarked rocks with depths of 14 and 19 feet.

Old Cilley Ledge, 1 mile southward of Hart Island, is about 0.5 mile long. The eastern end of the ledge is awash at extreme low water, and its western end is awash at high water. A bell buoy is 0.3 mile eastward of the eastern end.

Marshall Point is 2.2 miles southwestward of Mosquito Head and on the east side of the southern entrance to Port Clyde. **Marshall Point Light (43°55.0′ N., 69°15.7′ W.)**, 30 feet above the water and visible 11 miles, is shown from a white tower, connected to the dwelling by a bridge, on the end of the point; a fog signal is at the light. See Appendix for **storm warning** display.

Port Clyde (Herring Gut) is a small but excellent harbor and anchorage between Marshall Point and Hooper Island, about 9 miles north-northeastward of Monhegan Island. Fishermen and coasters use it as a harbor of refuge. A bar, covered with boulders and with a depth of about 8 feet, obstruct the northern entrance. Vessels of 15-foot draft have been taken over this bar at high water by local pilots, but strangers should not attempt it.

The **anchorage** is anywhere in the channel inside of Marshall Point, in depths of 23 to 35 feet, good holding ground, and has a clear width of 200 to 250 yards. Good anchorage is also found, in southerly weather, northward of Hooper Island eastward of a line between Blubber Island and Hooper Point in depths of 21 to 24 feet.

Ice usually does not interfere with navigation. In very severe winters the harbor may be frozen over for a short time.

Vessels can approach the southern entrance to Port Clyde from eastward, between Mosquito Island and The Brothers, or from westward through Davis Strait. Entering from southward, vessels should pass eastward of the bell buoy eastward of Old Cilley Ledge and steer for Marshall Point Light, passing 0.3 mile eastward of Black Rock to a position over 200 yards westward of Gunning Rocks; then steer for the horizontally-banded buoy marking the shoal off Marshall Point. Pass 200 to 300 yards westward of Marshall Point Light, leaving the horizontally-banded buoy to starboard, and enter the harbor in midchannel. Anchorage may also be had 125 yards off the wharves at Port Clyde, in depths of 21 to 35 feet, soft bottom.

There are entrances from northward on either side of Raspberry Island, a small islet about 20 feet high in the middle of the northern entrance. The passages on both sides of the island have depths of about 5 feet, but they are narrow and difficult and should not be attempted without local knowledge, except in small craft. The easterly channel is best for strangers in small craft. The best water follows the eastern shore at a distance of about 70 yards and passes eastward of a reef which makes eastward from a small islet.

The village of **Port Clyde** (P.O.), on the eastern side of the harbor, has no rail connection, but a highway runs to Thomaston. The village is the headquarters of many fishing boats and has a fish wharf with depths of 12 to 15 feet. A fish cannery, with a depth of 6 feet at its wharf, is on the northwest side of Marshall Point. There are a number of wharves, some with float landings, with depths of 6 to 18 feet alongside. Numerous other wharves are bare. Gasoline, oil, diesel oil, water, ice, and some marine supplies can be obtained. Mail, passenger and freight service is maintained to Monhegan Island and Criehaven from Fields Wharf which has gasoline and diesel oil piped to it.

A general store, hotel, and small restaurant are in the village. There is telephone and telegraph communication. A small private boatyard with machine shop and a marine railway will haul out craft up to 40 feet in length and 6-foot draft in an emergency only.

St. George River entrance is about 9 miles southwestward of Whitehead Island and north-northeastward of Monhegan Island. Marshall Point Light marks the eastern approach, and Franklin Island Light the western. The Georges Islands extend 6 miles south-southwestward from the middle of the entrance which also is obstructed by numerous ledges and rocks, the most prominent of which are marked by buoys or daybeacons. St. George River extends 10 miles in a northeasterly direction to the town of Thomaston, above which, it is shallow and of no commercial importance.

The channel depth in the river up to Broad Cove is 59 feet or more; above this the depth gradually decreases and the channel narrows to a small stream through extensive flats that bare at low water. From a point about 1 mile below Thomaston, a narrow channel, subject to shoaling, was dredged to a depth of 16 feet. The channel in the upper river is marked by buoys, and the sharp bend in the dredged channel near Thomaston is marked by a daybeacon. The controlling depth is about 14 feet with the exception of shoaling to 2 feet in the westerly half of the channel at the bend, and a 2-foot shoal about 0.4 mile below the bend which was reported in 1959. In 1958, it was reported that the shoal in midchannel northeastward of the daybeacon dried at low water, leaving a narrow channel on each side of it. Local knowledge is required to carry the best water.

Good anchorage for vessels of deepest draft is found eastward of Caldwell Island in depths of 33 to 53 feet,

soft bottom; above this, vessels anchor anywhere in the channel where the depth is not too great, or in Turkey, Maple Juice, Otis or Broad Coves.

The mean range of the **tide** at Thomaston is about 9.4 feet. **Ice** closes the river to navigation from December to March in severe winters. In ordinary winters, it is not usually closed entirely for more than one month, although ice sufficient to interfere with navigation may be encountered at any time for a period of three months.

The approach to the entrance of St. George River has very broken and irregular bottom, with numerous ledges bare and submerged. Strangers should proceed with caution and avoid crossing broken areas where the charted depth does not greatly exceed the draft.

In approachng and entering St. George River no difficulty should be experienced by the navigator by closely following the chart and the aids, having due regard for the unmarked dangers most of which have been described in the preceding paragraphs. The anchorages in the lower river have been described previously. Above the narrows there is excellent anchorage near the middle of the river off Otis Cove. Passage in the river above the narrows should be guided by the chart and the buoys. The safest time is at low water and on rising tide when the floats are bare.

Georges Islands are a group of islands and rocks extending about 6.5 miles south-southwestward from the middle of the entrance to St. George River. The larger islands are in general wooded, and the smaller ones grassy or rocky; there are few prominent landmarks. Several channels lead between the islands; the most important are Davis Strait, the channel between McGee and Seavey Islands, and the channel northwestward of Caldwell Island.

Old Man Ledge, the most southerly of the dangers is marked by a daybeacon. A lighted whistle buoy is about 0.3 mile south of the daybeacon. **Old Woman Ledge,** 0.6 mile northward of Old Man Ledge, is bare at half tide.

Burnt Island, the eastern large island at the south end of Georges Islands, is about 160 feet high, wooded, and marked on its summit by a conspicuous Coast Guard lookout tower. There is a Coast Guard station on the northwest side of the island. A wharf and marine railway are on the west side of a small peninsula near the Coast Guard station. At low water there is no passage between Burnt Island and **Little Burnt Island,** just north of the peninsula.

Georges Harbor is between **Allen Island,** 0.5 mile west of Burnt Island, and **Benner Island,** off the northwest side of Allen Island. There is a small settlement of fishermen, and small craft sometimes anchor there. The best water is midchannel in entering the thoroughfare from northeastward. Entering from southwestward, the south side should be favored.

Davis Island, 0.9 mile northwestward of Burnt Island, is grassy, and has two knolls with a saddle between. **Davis Strait** is the passage between Davis Island on the south, and **Thompson Island** and other small islands on the north. The two southernmost islets on the north side of Davis Strait are grassy, and the others are wooded. The passage is part of the through route used by many vessels of 12-foot draft or less. It is reported that barges drawing 16 feet use this strait. It has ample depth, but **Griffin Ledge,** in midchannel, has a depth of 10 feet over it. On the south side of the ledge is a buoy, and the channel, which is south of this buoy, is only 75 yards wide.

Between Thompson and Hooper Islands the bottom is very broken, and there are numerous dangers, most of which are marked or visible at some stage of the tide. **The Sisters,** 1.3 miles east of Thompson Island, are two small ledges awash at low water; a buoy is on the northwest side of the ledges. **Old Horse Ledge,** 0.4 mile northwestward of The Sisters, is bare at low water and marked by a daybeacon.

Outer Shag Ledge, 0.3 mile westward of Old Horse Ledge, is bare at half tide and **Inner Shag Ledge,** 0.3 mile west of Outer Shag Ledge, is awash at high water. **Kelp Ledges,** 300 yards west of Hooper Island, have a small part bare at low water. **Gig Rock,** 0.6 mile southwest of The Sisters, has a depth of 7 feet over it; a bell buoy is off the northwest side of the rock.

Bar Island, 0.7 mile west of Hooper Island, is low and grassy. There is ample depth in the channel between Bar Island and **Seavey Island** on the northeast and larger McGee Island on the southwest. Some of the dangers are buoyed, but there are unmarked dangers close to the channel. The passage is used by small boats. **Jenks Ledge,** the most westerly danger off the passage, is bare at low water and marked by a buoy.

Deep Cove, on the eastern shore just north of the northern entrance to Port Clyde, has good anchorage in depths of 21 to 43 feet, soft bottom. **Caldwell Island** is at the northern end of the Georges Islands, and the middle of the entrance to St. George River.

Gay Cove is a shallow and unimportant cove in the eastern shore of Gay Island, the western point at the entrance of the river.

Pleasant Point Gut separates Gay Island from the mainland. Its western part is bare at low water. **Pleasant Point** (P.O.), a village of fishermen, is along the shore of the mainland. There are several fish wharves, one of which has a depth of 4 feet alongside; the others are bare or have depths of less than 3 feet alongside. Gasoline, oil, and some supplies can be obtained at a float landing with 6 feet alongside. Two private wharves with float landings are on **Gay Island** on the south side of the harbor. A well-equipped machine shop where marine work is done is at the entrance to the harbor. Local small craft are reported to make passage through the western entrance to the gut about half tide. Strangers should not attempt it.

Turkey Cove, on the eastern shore of the river about 1.5 miles above Caldwell Island, has good anchorage in depths of 15 to 27 feet, soft bottom, about midway between the points at the entrance.

Maple Juice Cove is a long, shallow cove on the west shore about 2 miles above Caldwell Island. Good anchorage is found at the entrance in depths of 13 to 24 feet.

Otis Cove, a broad cove shallow at its head, is on the eastern shore about 1.7 miles above Turkey Cove. There is good anchorage off the entrance in depths of 20 to 27 feet. There are no wharves.

Broad Cove, on the western shore about 4.5 miles above Caldwell Island, is shallow. The village of **Cushing** is near the northern shore. There is a wharf which bares at low water. **Bailey Ledge, off** the southern entrance, is bare at low water and marked on the southeast side by a buoy.

Watts Cove is a shallow cove on the eastern shore opposite Broad Cove. The village of **St. George** (P.O.) is at the head of the north arm of the cove.

Abandoned **Fort St. George** is on the east side of the river about 1.5 miles above Broad Cove.

Thomaston (P.O.) is a town on the railroad near the head of navigation on the St. George River. There is no waterborne commerce. The Maine State Prison, an elevated tank, and a radio mast on the bluff in the west end of the town, a church spire, and a railroad bridge across the mouth of Mill Creek on the east end of the town are conspicuous.

A **pilot** for the river can usually be obtained at Port Clyde or from among the fishermen off the entrance, or at Monhegan Island.

There are five boatyards in the town where craft up to 100 feet in length can be built. Three of the yards have marine railways. Hull, engine, electric, and electronic repairs can be made. Welding and steel work can be carried out. Open and covered dry winter storage is available. Two main wharves have 12 feet alongside, but in 1958 were not in good repair. The others are dry at low water. There are no facilities for fueling on the wharves but it can be supplied by tank truck at the two main wharves. Water, ice, provisions, marine hardware, and ship chandlery are available. The **harbormaster** can usually be found at the store near the upper of the two main wharves on the north side just below the bascule highway bridge.

St. George River is crossed at Thomaston, above the wharves, by a bascule highway bridge with a clearance of 6 feet; the nearby overhead power cable has minimum permit clearance of 50 feet.

A short distance above Thomaston are two fixed bridges; a highway and a railroad bridge. The piers of a former wooden bridge just below the railroad bridge are covered at high water and form an obstruction in the channel. There is little traffic, except small boats in this part of the river. The fixed railroad bridge across the mouth of Mill River, east of the town, has clearance sufficient only for very small craft.

8. MUSCONGUS BAY TO CAPE ELIZABETH, MAINE

Chart 1204.—Containd within the limits of this chapter are the descriptions of Muscongus, Booth, Sheepscot, and Casco Bays; Medomak, Damariscotta, Sheepscot, Kennebec, and New Meadows Rivers; and the ports of Portland and Bath. This area has many islands, rocks, and long peninsulas. Many of the islands have been joined by fixed highway bridges; thus, so far as masted vessels are concerned, whole groups become additional long peninsulas. In general, the outer islands and rocks rise from deep water and the lower parts of the rivers are deep.

Boundary lines of inland waters.—The lines established for this section of the New England coast are described in § **82.5,** Chapter 2.

Chart 313.—Muscongus Bay, between the Georges Islands on the east and Pemaquid Neck on the west, forms the approach to Meduncook and Medomak Rivers and Muscongus Sound, the villages of Friendship, Round Pond, and Medomak, and the town of Waldoboro. The bay is frequented by small pleasure and fishing craft. It is obstructed by numerous islands and ledges and much foul ground. Many of the dangers are marked by buoys.

Moser Ledge the outermost of the dangers with a depth of 15 feet, marked by a buoy, lies about in the middle of the entrance to the bay, midway on a line between Monhegan Island Light and Pemaquid Point Light.

Franklin Island Light (43°53.5′ N., 69°22.5′ W.), 57 feet above the water and visible 13 miles, shown from a white tower on the northwestward side of **Franklin Island,** is the principal aid to the approach, and passage through the bay. The light is obscured by trees from 253° to 352°.

Access to the eastern side of the bay, between Allen Island and Franklin Island, is obstructed by an area of islands, and mostly unmarked shoals and ledges. The area, about 3 miles long north and south and 2 miles east and west, is bounded on the west by **South Ledge,** an unmarked 14-foot ledge; **Eastern Egg Rock,** low and bare and marked on its north side by a daybeacon; **Egg Rock North Ledge,** marked on its southeast side by a buoy; **Hough Ledge; Little Franklin Ledge;** and Franklin Island. Its eastern side is bounded by **Shark Island; Little Egg Rock Shoals,** all unmarked; **Seal Ledges,** marked on their north end by a buoy; and **The Kegs,** marked by a daybeacon. On the north end of the area is **Gangway Ledge,** a bare rock and ledge area, which is unmarked.

Three deep, natural, mostly unmarked channels, narrow in places, lead in a northerly and northeasterly direction past, or through the area, and into the St. George River. South Channel leads west of Georges Islands. Western Passage leads westward of the area of islands, shoals, and ledges near the center of Muscongus Bay, and westward of Eastern Egg Rock and Franklin Island. **Old Hump Channel** leads through the center of the area.

A buoyed channel marked for a westerly crossing, known as **Davis Strait Passage,** is used mostly by small craft proceeding between Permaquid Point and Port Clyde or Penobscot Bay, via Muscle Ridge Channel. From a fairway bell buoy off its western entrance between Eastern Egg Rock and Egg Rock North Ledge, this passage crosses Old Hump Channel, then passes between **Old Hump Ledge** and Seal Ledges; thence through Davis Strait; thence northeastward past Gig Rock; thence between Old Horse Ledge and The Sisters; thence southward of Hooper Island and northward of Allen Ledge to the entrance to Port Clyde. Craft proceeding farther eastward continue on passing southward of Marshall Ledge; thence between Gunning Rocks and Mosquito Ledge, and thence southeastward around Mosquito Island and Barter Shoal before rounding up to the northwestward for Muscle Ridge Channel.

The ferry from Port Clyde to Monhegan Island uses Davis Strait Passage when outward bound in westerly weather, as it affords some protection from westerly swells as far as Eastern Egg Rock, with a quartering sea for the run from there through the open sea to the island. Returning to Port Clyde from the island, it usually takes the more direct route through the Allen Islands either through the channel between Allen and Burnt Islands in clear weather, or at other times, to the eastward of Burnt Island.

A group of islands in the middle of the bay, extending 3 miles southwestward from Friendship Island, separates the approaches of the St. George and Meduncook Rivers from the Medomak River. This group includes **Crane, Harbor, Hall, Black, Otter, Cranberry** and **Morse Islands.** Surrounding and interspersed between these islands are numerous rocks and ledges, such as **Harbor Island Rock** marked by a buoy on its west side. **Black Island, Otter Island, Beyer Ship,** and **Morse Ledges,** all unmarked. The passages between these islands and ledges are mostly shoal, foul, and unmarked, and of interest only to local craft.

In the western part of the bay, islands and ledges extend 3 miles southward from Louds (Muscongus) Island. **Bar Island** is grassy and has a cottage in the center, **Haddock Island** is wooded, and **Ross Island** is grassy.

Haddock Island Kelp Ledge is marked on its south side by a buoy. **Webber Dry ledge** is awash at high water.

Webber Sunken Ledge with a rock awash, marked by a buoy, extends 0.3 mile south of it. **Browns Head Ledge,** with 13 feet on it, is marked by a buoy. **Bar Island Ledge,** 0.2 mile long and bare in one place at low water, is marked on its south end by a buoy.

The most southerly of these ledges are **New Harbor Sunken Ledges** marked at their south end by a buoy. The reef extending 0.3 mile eastward of **Western Egg Rock,** the southeasternmost of this group of ledges, is marked by a buoy.

Devils Elbow, which dries 1 foot; **Devils Back,** drying 8 feet; **Devils Limb; Wreck Island** and **Garden Island South Ledges,** all unmarked and dangerous; **Wreck Island;** and **Jones Garden Island,** are all on a line about 1.5 miles eastward of Louds Island; Jones Garden Island being the northeasternmost of the group.

Haddock, Ross, Marsh, Killick Stone, Thief, and **Indian Islands** are all part of the western group and lie southward and eastward of Louds Island.

Meduncook River is an estuary making in a general northeasterly direction, just westward of St. George River; the entrance forms an approach to Friendship Harbor, and is a good anchorage in 24 to 30 feet. The approaches to the entrance are the same as for St. George River, and the anchorage is marked by buoys.

The river above the anchorage is unimportant, has a narrow, crooked channel, and is obstructed by numerous unmarked rocks and ledges, so that local knowledge is necessary for its navigation.

Friendship Harbor is west of Meduncook River, from which it is separated by **Friendship** and **Garrison Islands;** between these two islands a buoyed channel leads from the anchorage in Meduncook River into Friendship Harbor.

A passage, foul and dry at half tide, but used by some local fishermen, leads into the harbor between Garrison Island and the mainland. An overhead power cable crossing the passage has a permit clearance of 20 feet.

Friendship Harbor is about 1 mile long and has good anchorage in 21 to 28 feet. It is used extensively by fishermen and yachtmen. Ice seldom closes the harbor and in 1958, it was reported, that only twice in the past 18 years had ice interfered with navigation, and then only for short periods.

A ledge extends 300 yards southwestward from **Jameson Point** to a rock, bare at low water, which is marked by a daybeacon. On the southern side of the entrance, opposite the daybeacon, a shoal with a cleared depth of 7 feet at its outer end, extends about 300 yards into the channel from Friendship Island, and is unmarked.

Above the wharf the northern and eastern sides of the harbor should be given a berth of over 200 yards. The southeast side of the harbor should be given a berth of over 200 yards. **Murphy Ledge** is a rock bare at half tide and marked by a daybeacon, 200 yards from the southeast side of the harbor abreast Jameson Point. A shoal with a cleared depth of 14 feet, about 200 yards north-northeast of the daybeacon on Murphy Ledge, is unmarked. In the eastern part of the harbor a shoal extends 350 yards northeastward from the northeast end of Friendship Island, and is marked at its end by a buoy.

Friendship (P.O.) is a town on the north shore of the harbor. A church spire is conspicuous. There are a number of wharves with float landings with 6 to 12 feet alongside at which overnight berthing may be had. The town wharf has no float and dries at low water. Gasoline and fresh water are piped to most of the landings, and diesel oil can be obtained by tank truck. There is a boat building yard in the harbor and another in the cove on the northeast end of Friendship Island which can build or haul out for repairs or dry covered or open winter storage, craft up to 45 feet in length. General hull and engine, electric and electronic repairs can be made. Ice, provisions, yacht supplies, and ship chandlery can be obtained. There is a restaurant, hotels, lodging, and parking, and a ramp for launching small craft from trailers are available.

Hatchet Cove is a shallow cove making northward at the western end of Friendship Harbor. A narrow unmarked channel with a least depth of 11 feet leads northeastward into the cove near the western point at its entrance. It is unimportant as an anchorage, and the landings are bare at low water. There are two boatyards with marine railways in the cove, one on the west side and the other on the east side of the head. Craft up to 100 feet in length are built at the latter, and craft up to 45 feet in length are hauled out for repairs. Dry open and covered winter storage is available at both yards.

Gull Rock, in the western entrance to Friendship Harbor, includes two rocks bare at high water. A ledge with a cleared depth of 20 feet at its southwestern end, is about 0.4 mile eastward of Gull Rock.

Medomak River enters the head of Muscongus Bay westward of Martin Point, the western point at the entrance to Friendship Harbor. Strangers wishing to enter the river should take a local pilot on account of the many unmarked dangers, narrow and crooked channels, and strong tidal currents which require local knowledge.

The lower part of the river is about 2 miles wide, but is separated by several islands into two approaches; these have three narrow and crooked channels by which entrance is made to the river proper. The approaches to these channels are through Muscongus Bay or Muscongus Sound.

The eastern approach is 0.5 mile wide and comparatively clear of dangers. At its upper end are two passages leading into the river, one through **Back River Cove** and the other **Flying Passage.** Both of these passages are narrow, having rocky shoals near their middle and on their edges which, together with the strong tidal currents, make them difficult to navigate.

Hockomock Channel, the western approach, has much better water and is the preferred channel despite the

fact that it is narrow in places and has strong tidal currents.

There are several fish wharves on **Keene (Hockomock) Neck,** on the west side of the channel, at which gasoline and some supplies can be obtained. One of these, behind Oar Island, has a lobster pound adjoining it and a float landing with 6 to 8 feet alongside. Some protection from east and southeast winds is afforded this landing by the hulk of the five-masted schooner CORA CRESSY, which has been hauled up on the reef between Oar Island and the neck. A limited supply of fresh water can be obtained at the landing, and provisions and some supplies can be obtained in the village of Medomak.

The channel in Medomak River has ample depth for 5 miles above the entrance. Some of its dangers are marked, but there are unmarked ones close to the channel. For the next 2.5 miles to within 1.6 miles of Waldoboro, the channel leads between flats bare at low water, or nearly so, and shoals gradually to 5 feet.

The **controlling depth** to Waldoboro is about 3½ feet. In 1958 there was no commercial shipping, and limited fishing and small boat activity on the river to Waldoboro. The channel can best be followed at low water when the flats are visible, or on a rising tide. Ice closes the river from December to April above The Narrows.

Currents in **The Narrows,** between **Locust Island** and **Havener Ledge,** are reported to be very strong.

Medomak (P.O.) is a village on the western side of Hockomock Channel. There is a town wharf and float landing with 2 feet alongside and a fish wharf with a depth of 4 feet, about 0.5 mile southward of the village. Gasoline is piped to this wharf and water to the town landing. Provisions and some supplies can be obtained at a general store in the village.

Broad Cove, on the west side of Medomak River, is used by a few fishermen. The channels are unmarked.

Waldoboro (P.O.) is a town on the railroad at the head of navigation on Medomak River. In 1958 there was no commercial shipping by water from the town. The old steamer wharf was in disrepair, and the fish factory had burned down, and its wharf was in ruins. There was a little water alongside either wharf and no facilities. The town has a library, markets, restaurants and hotels; and provisions; ice, and some supplies can be obtained. Gasoline can be obtained from a filling station and diesel oil on order by tank truck.

Pemaquid Neck, a wooded peninsula, is on the west side of Muscongus Bay. **Pemaquid Point,** the south end, is marked by **Pemaquid Point Light (43°50.2′ N., 69° 30.4′ W.),** 79 feet above the water and visible 14 miles. The light is shown from a white pyramidal tower. The town of **Pemaquid Point** (P.O.) is on the southern end of the neck.

A gong buoy is 500 yards south of Pemaquid Point and **Pemaquid Ledge,** nearly 1 mile south of the point, is covered by 10 feet of water, and marked by a buoy on its southeast side.

Pumpkin Cove Ledge, 1 mile east-northeastward of Pemaquid Point Light, is unmarked and has a least depth of about 19 feet. The sea breaks on it in heavy weather.

New Harbor Dry Ledges are 2 miles northeastward of Pemaquid Point Light and extend 0.3 mile from the shore. The ledges are 0.3 mile long, with a bare rock near each end, and no safe passage for strangers between them and the shore. **Little Island,** showing a clump of trees, is 200 yards from the shore 0.2 mile sooothward of New Harbor. It is the highest part of a ledge about 0.3 mile long.

New Harbor (P.O.) is on a cove of the same name on the western shore of Muscongus Bay, about 2.5 miles northeastward of Pemaquid Point Light. It offers anchorage to small craft only and is open eastward. The channel is narrow between a shelving ledge extending northeastward from the south point at the entrance, and a ledge just inside it which extends halfway across from the north side and is marked at its end by a buoy. The channel, about 150 feet wide, then leads northwestward of a daybeacon, where it is constricted to a width of 100 feet by a ledge with 6 to 9 feet over it which extends about 75 feet northwestward of the daybeacon. The daybeacon should be given a berth of 100 feet to avoid the ledge.

There are general depths of 6 to 12 feet in the harbor, which is reported to have shoaled considerably at its upper end. It is reported that ice does not prevent navigation in the winter.

There are several service wharves with float landings with 4 to 6 feet alongside and a fish wharf with 8 feet alongside. Gasoline, diesel oil, and fresh water are piped to the service landings. Ice, provisions, marine hardware, small stores, and ship chandlery are available at the landings. A fleet of seiners operates from the harbor, and ground fish are shipped from the port by truck. Lobsters can be obtained at the landings. The town has markets, restaurants, and lodging. There is no marine railway, but craft are ground out for minor hull and engine repairs. There is one boat building yard where craft up to 50 feet are built. A fish spotting seaplane operates from the harbor.

Back Cove, a southwesterly arm of New Harbor, has good anchorage in from 6 to 25 feet for 100 yards inside its entrance with lesser depths farther up the cove, but is used principally by local pleasure and fishing craft. The head of the cove is shoal and foul. There are a number of private and fish piers but no facilities.

Long Cove, about 0.6 mile northward of New Harbor, is about 0.5 mile long and 250 yards wide at the entrance. It affords good anchorage in from 14 to 53 feet to within 400 yards of its head in all but southerly weather. It is used extensively by local pleasure and fishing craft. There are a number of private and fish piers, and it has a small boatshed and private marine railway at the head. The approach to the cove from the southward is clear from northward of **Salt Pond Ledge,** an unmarked ledge with 8 feet over it, about 0.4 mile south of the entrance. There are no facilities in the cove.

Louds (Muscongus) Island is inhabited mostly by fishermen; there are also some farms on the island.

Loudville (P.O.) is a village on the cove on the east side of the island northwestward of the northern end of Marsh Island. There is reported to be a wharf in the cove, which dries out at low water. Some supplies can be obtained at a store close northward of the wharf.

Marsh Harbor, on the southeast side of Louds Island between it and Marsh Island, is seldom used as an anchorage.

Muscongus Sound is on the western side of Muscongus Bay, between Louds and Hog Islands on the east and the mainland on the west. It is about 0.5 mile wide and 5 miles long, and has several rocks and ledges near its southern entrance, the most prominent of which are marked by buoys. Above the Poland Ledges to abreast Muscongus Harbor, the depths in the sound shoal gradually from 48 to 24 feet, and anchorage can be selected by reference to the chart.

Webber Sunken Ledge, Webber Dry Ledge, Browns Head Ledge, Bar Island Ledge, all previously described, and **Webber North Ledge,** with 15 feet over it and unmarked are dangers in the southern entrance to Muscongus Sound.

Poland South Ledge has a depth of 9 feet, but **Poland North Ledge** bares at low water. Both are marked on the east side by buoys. The better channel leads eastward of them. An unmarked ledge with a depth of 18 feet over it is about 350 yards southeastward of Poland North Ledge.

Round Pond is a small landlocked harbor with 12 to 18 feet in its middle on the west shore of Muscongus Sound, about 2 miles above the southern end of Louds Island. It affords good anchorage for small vessels. **Round Pond** (P.O.), a village with a town landing is at the head of the harbor. The northeast and southwest ends of the harbor should be given a berth of 350 yards, and the west side 200 yards. The best water in entering favors the north side, northward of the buoy marking a 7-foot rock near the end of a reef making northward from the point on the south side of the entrance.

The town landing has 2 feet alongside its float. A submerged pile is about 90 yards southeastward of the landing. Gasoline, oil and some supplies are available at a fish wharf and float landing with 3 feet alongside southward of the town landing. There is a general store and restaurant in the village, and ice can sometimes be had. There is a ramp for launching small craft from trailers, and lodging and parking are available.

Tides and currents.—The mean range of tide is about 9 feet. Off the entrance to Round Pond there is practically no flood current; the ebb has a velocity of about 0.5 knot at strength.

Muscongus Harbor is a small cove and village on the west shore of the sound about 1.5 miles above Round Pond. There are no public landings. During the summer a few fishing boats anchor just inside the entrance in from 5 to 8 feet of water.

Greenland Cove is the extreme northern end of the sound. It is shallow and of no importance. **Bremen** is a small village at the head of the cove.

Lower Narrows, leading into the head of Muscongus Sound north of Hog Island, has a depth of about 13 feet. The principal dangers are marked, but local knowledge is necessary to carry the best water.

The Audubon Society of America maintains a camp on the northeast point of Hog Island, at which there are several buildings and a float landing.

Directions, Muscongus Bay and Sound.—This region is an area of rocks and ledges and very broken bottom. Many of the dangers are unmarked. The preceding paragraphs describing the area, by pointing out the dangers, give the simplest directions and especially where necessary, the need for local knowledge. The chart and the aids must be carefully followed.

Chart 314.—Johns Bay is westward of Pemaquid Neck, between it and **Rutherford Island.** Its entrance is about 1.4 miles wide, and the length of the bay is 2 miles to Johns Island, above which the Pemaquid River empties into the northeastern end and Johns River into the northwestern part. Depths in the bay are very irregular and there are several ledges and rocks.

Though not commercially important, the bay has many summer resorts on its shores and is used as an anchorage by fishermen and yachtsmen. The holding ground is poor except in a few spots near the head of the bay and in the coves. Port Clyde, eastward, and Boothbay Harbor, westward, are preferable at all times.

Pemaquid Harbor is at the entrance to Pemaquid River, northeastward of Johns Island. The bottom is rocky and irregular, but there is a fair anchorage for small vessels in the eastern part of the harbor between **Fish Point** and the entrance of Pemaquid River in 36 feet. The preferred anchorage for small craft is said to be north of the fort where the bottom is soft in places. The village of **Pemaquid Harbor** (P.O.) is on the north side of the entrance to the harbor.

Pemaquid River extends northeastward about 2 miles to the village of **Pemaquid** (P.O.). The river is dry at low water near its head and has a narrow, crooked, and unmarked channel. On the point marking the southern entrance to Pemaquid River there is a prominent stone tower marking the position of the former **Fort William Henry.**

Pemaquid Beach (P.O.) is a village on the south side of Pemaquid River at the entrance. At the old fort is a fish wharf with float, and another is a short distance to the northeastward. Depth at the lower wharf is 10 feet at the float. The upper one has 6 to 10 feet at the float; gasoline, oil, fresh water, ice, provisions, bait, and lobsters are available. Restaurants are on the wharves and picnic and parking areas adjoin them. Docking space is available for overnight berthing, and restrooms and telephones are on the upper wharf. A market is in the village close-by. Boat rental is available.

A reef almost bare in places at low water extends offshore between the two wharves; a buoy is southwestward of it. Several small fish wharves are to the eastward. A fish wharf with 4 to 6 feet at a lobster car float is on the north side of the harbor. Gasoline, oil, diesel oil, and

some supplies are available at the float. There are also a number of private float landings and boatsheds on the north side of the harbor.

Care should be taken to avoid the piling of an old wharf on the western side of the inner harbor.

Thurston Ledges are mostly bare rocks extending 300 yards southward from the north side at the entrance of Pemaquid Harbor, their south edge being 300 yards northward of Beaver Island.

Pemaquid Harbor can be entered from westward by passing 125 to 150 yards northward of **Beaver Island,** the high rounded islet with some trees located 300 yards northward of Johns Island. Or, when 0.5 mile or more southward of Johns Island, steer **355°** so as to pass 150 yards eastward of Johns Island and 125 yards westward of the western bare rocks of **Knowles Rocks.**

A ledge, partly bare at half tide, extends 225 yards north-northeastward from the north end of Johns Island, where it is marked by a spindle, and another shoal with a cleared depth of 12 feet is about 0.3 mile south of the island.

McFarlands Cove is on the western side of Johns Bay, northward and westward of **Witch (Davis) Island.** A steep 150-foot hill is on the west shore of the cove. There is good anchorage in 24 to 36 feet in the cove for a small vessel about 300 yards northward of the island.

McFarlands Ledges, about 450 to 800 yards north-northeastward of Witch Island, have a rock covered at half tide near the north end, and one bare at low water at the west end. A buoy marks the south end of the ledge. **Corvette Ledge,** about 200 yards northeastward of Witch Island, has a depth of 3 feet. A buoy marks the north end of the ledge. When entering the cove from the eastward between the buoys marking these two ledges, care should be taken to avoid the rock awash, lying 200 feet off the northwestern point of Witch Island.

The Gut, a thorofare connecting McFarlands Cove with Damariscotta River, is described under the description of that river.

Johns River extends northward about 2 miles above McFarlands Cove and separates into two branches. **Eastern Branch (Foster Cove)** is the eastern, and **North Branch (Western Branch)** is the western. **Poorhouse Cove (Robinson Cove)** makes into the western shore of Johns River above High Island. Good anchorage is available in depths of 18 to 24 feet southeastward and eastward of **Sproul (Clarke) Point.** The river is little used. Two boatyards which haul out and store yachts up to 35 feet in length are in Poorhouse Cove; one on Sproul Point and the other at the head of **Bradstreet Cove,** a western arm of Poorhouse Cove.

Directions, Johns Bay.—Stand up the middle of the bay, heading for the eastern shoulder of High Island, and pass 300 yards westward of Johns Island and the same distance off the eastern shore northward of Pemaquid Harbor. Then keep in midchannel until abreast of High Island, and then pass about 50 yards westward of the buoy marking a rock with 10 feet over it, about 350 yards northeastward of High Island, anchor near midriver, about 400 yards northward of the buoy, in 18 to 24 feet.

Thread of Life is a narrow, deep channel lying between Thread of Life Ledges and Crow Island on the east, and the southern part of Rutherford Island and Turnip Island on the west. It is used by small local vessels entering Johns Bay from westward, or from Damariscotta River. **Thrumcap Island** is partly wooded in its northern part and has a prominent house. **Thread of Life Ledges** are bare or grassy islets; **Turnip Island,** partly wooded, has a house on it. **Crow Island** is wooded. A shelving ledge awash at low water, marked by a buoy, extends 300 yards southwestward from **Hay Island,** which is wooded. The channel between **Birch Island,** northward of Hay Island, has been dammed off to form lobster pounds. The hulk of an old tug, aground, rests against the southernmost dam, and a fish pier with float landing is at the northernmost dam.

To pass through Thread of Life from westward, after clearing Fisherman Island Passage, steer for the north end of Thrumcap Island with Ram Island Light astern. Pass 400 yards southward of The Bulldog, bare at half tide, and then 500 yards southward of the two rocks, covered at high water, which are 350 yards eastward of Inner Heron Island. When about 400 yards from the north end of Thrumcap Island, round up to the northward keeping 200 yards off Thread of Life Ledges, and pass midway between them and Turnip Island. Continuing in midchannel to the north end of the passage, pass into Johns Bay between the buoy south of Hay Island and the buoy marking the ledge extending 200 yards northward of Crow Island.

The entrance to **Damariscotta River** is about 3 miles westward of Pemaquid Point Light and 1 mile northeastward of Ram Island Light. From its mouth the river trends in a general north-northeast direction for 14 miles to the towns of Damariscotta and Newcastle, at the head of navigation. It has been navigable to these towns for vessels of 18-foot draft at high water, but the tidal currents are strong. Although some of the dangers are marked by buoys, strangers in anything but small craft should not pass through, or above The Narrows at Fort Island without a pilot.

The channel of the river is crooked. In many places it is very narrow, because of the constricting islands and ledges. For a distance of 11 miles above the mouth of the river a least depth of 20 feet may be carried in the channel, although there are many unmarked 16- to 18-foot spots on each side of the channel. Above this point the water shoals to 10 feet just below the town of Damariscotta.

The channel just below the town had a controlling depth of 9 feet in 1958. The channel for 2 miles south of the Damariscotta-Newcastle Bridge is noted for the mud flats on both sides; care should be exercised in piloting. Above the bridge, navigation is impossible except at slack water and with local knowledge.

The islands and shoals southwestward of the entrance are described in connection with Booth Bay.

The **White Islands,** about 1.5 miles south of the entrance to Damariscotta River, are prominent. The northern island is grassy with standing trunks of dead trees which are conspicuous. The southern island is heavily wooded on the northern two-thirds and is bare rock on the southern third. There is a summer home on the island, with a mast with signal yard in front of it. The south end of the island should be given a berth of at least 300 yards because a sunken rock with 2 or 3 feet over it is reported to lie about 150 yards off the southern tip of the island.

Southward and southwestward of the White Islands, **Outer Heron Island,** wooded, and **Pumpkin Island,** together with their off-lying ledges, extend about 2.5 miles. **Outer Heron Island Ledge,** with a depth of 6 feet, about 0.85 mile east-southeastward of Outer Heron Island, is marked on its east side by a buoy. **Southeast Breaker,** with 19 feet over it, about 0.7 mile southeastward, and **Pinkham Shoal,** with 8 feet over it, about 0.5 mile southwestward of Pumpkin Island, are unmarked. An unmarked rocky shoal, cleared to a depth of 10 feet, is about 0.5 mile eastward of the southern tip of the island.

Anchorages.—Vessels bound into the river usually go as far as Meadow Cove, just above East Boothbay, where good anchorage is available in 30 to 48 feet, keeping 150 yards offshore. This is as far as a stranger should attempt to go. Above The Narrows vessels can anchor anywhere in the channel where the bottom and depth are suitable.

Directions.—Extreme caution is necessary in this region which has many rocks and ledges and very broken bottom.

With the aid of the chart enter the river midway between the gong buoy off Little River and the buoy marking Inner Heron Island Ledge, keeping in midriver for about 1.5 miles above Inner Heron Island.

There are unmarked 16-, 20-, and 25-foot spots between **Farnum Point** and Rutherford Island, and care should be taken to pass 150 to 200 yards west of the buoy there; when abeam of Farnum Point bear off to the northwestward and pass not over 100 yards to the eastward of the buoy off Kelp Ledge before rounding up for the buoy off **Montgomery Point;** pass close-to and eastward of that buoy and haul in for the western side of the channel off **Meadow Cove;** anchor in 30 to 48 feet.

Small craft should have no trouble in going to the head of navigation with the aid of the chart. The best time is on a rising tide. It is reported that the buoy at the entrance to The Narrows tows under strength of the current.

Tides and currents.—The mean range of tide is about 9 feet.

The **tidal current** in the constricted sections attains an estimated velocity of 5 knots. The ebb lasts about 2 hours after low water in the upper part of the river and is usually stronger than the flood. The currents follow the general direction of the channel. Off Cavis Point the average velocity at strength of current is about 1 knot. See Tidal Current Tables for predictions.

Ice closes the river for a distance of 4 miles below Damariscotta during Janury, February, and March.

Pilots.—Fishermen at South Bristol or East Boothbay may be engaged as pilots.

Little River, a long narrow inlet in Linekin Neck on the west side of the entrance of Damariscotta River, has a number of private float landings and fish wharves. A junction gong buoy about 350 yards south of **Reeds Island** marks the entrance. The channel is narrow and constricted at the entrance, but a secure anchorage can be found in 10 to 15 feet in the outer section and 18 feet in the inner section of the inlet above the fish wharves on the east side. Small craft anchor near the head of the inlet above the narrows.

A ledge, locally known as **The Bull,** is in the middle of the entrance and is marked by a daybeacon on its east side. There is good water in midchannel on each side of this ledge, but in heavy weather the western channel should not be attempted. The best approach from close aboard the junction gong buoy off the entrance is to head for the daybeacon, passing it close to on the east side; then heading for the middle of the end of the point on the west side of the entrance. When about 100 yards from the point, head up the harbor favoring the western shore.

Treasure Island, with a house on it and connected to the shore by a fixed trestle bridge, is on the northeast side of the entrance to the inner section of the harbor.

There is a good holding ground, in 13 to 18 feet, mud bottom, in midchannel from abreast the first fish wharf on the east side to the private pier with floating landing just above the fish wharf on the west side, about 0.6 mile above the daybeacon. Above that point the harbor shoals rapidly. Local knowledge is advisable. Gasoline may be obtained at the first fish wharf on the east side.

Inner Heron Island, on the eastern side of the entrance to Damariscotta River, is thickly wooded. Two private float landings are on the northeast side; depths of about 12 feet are at their ends. Boats going to the landing must avoid the reef, bare at half tide, extending northward from the island to a buoy.

Inner Heron Island Ledge, 0.2 mile southwestward of the south end of Inner Heron Island, is bare at low water, and marked on the southwest side by a buoy. **The Bulldog,** 300 yards southward of the island, is bare at half tide. The rock 350 yards eastward of the island is bare a little after high water.

Other unmarked dangers exist between Inner Heron Island and the eastern shore, and this passage should not be used by strangers.

Christmas Cove is an anchorage for small craft or a very small vessel on the eastern side of the entrance, 0.7 mile north-northeastward of Inner Heron Island. The narrow entrance to the cove proper is midway between two bare rocks, the one on the southeast side being marked by a red triangle on a white slatted tripod

daybeacon. A spindle daybeacon marks the north side of the channel, and another marks the point of a ledge near the south side close westward of the club landing.

The anchorage with the best swinging room is in the middle of the cove off the landings in 22 feet. About a mile northeastward of the cove, a high square observatory tower, originally built as a summer home, is conspicuous.

To enter Christmas Cove, enter in midharbor, pass midway between the tripod daybeacon and the outer spindle and northward of the inner spindle.

Christmas Cove (P.O.) is a summer resort on the eastern side of the cove. The village residents formed into a village improvement association, maintain a private sport, social, and yachting club with two float landings with 3 and 10 feet alongside. A swimming pool, showers, and rest rooms are at the club. Eight guest moorings are maintained.

An inn across the cove from the club maintains a float landing with 12 feet alongside. Gasoline, water, and diesel oil are piped to the float. There is a ramp for launching small craft. Overnight berthing space is available. Provisions and some supplies can be obtained. Several private float landings are in the cove.

The Gut is a thoroughfare connecting Damariscotta River at South Bristol with McFarlands Cove and Johns Bay. The channel has been improved by dredging to a width of 25 feet and depth of 2 feet near the drawbridge, where the channel has its least depth. The bridge has a swing span with a clearance of 4 feet.

After passing through from eastward, boats must haul southward to avoid a ledge on the north side of the channel just westward of the bridge. The Gut east of the bridge is thickly congested with moorings and lobster pot buoys.

A shipyard on the north side of The Gut, west of the bridge, has a marine railway and can build vessels up to 117 feet in length, under cover, or haul out for hull and engine repairs, craft up to 60 feet in length and 12-foot draft. Berthing space in 5 to 10 feet is available at the 500-foot shipyard pier to which gasoline, diesel oil, and water are piped. Electric and electronic repairs can be made. Winter storage, open, covered, wet or dry is available at the yard and at several smaller yards in the area. Engine repairs can also be obtained at a well-equipped machine shop at a 280-foot pier with 4.5 feet at its float landing in the cove across The Gut from the shipyard.

South Bristol (P.O.) is a village on The Gut, on the east side of Damariscotta River, 2.5 miles above the mouth. There are a number of wharves with float landings. Two on the north shore east of the bridge are lobster wharves; one has gasoline and diesel oil piped to its float, which has 4 feet alongside; the other at the bridge has 12 feet alongside its float and has gasoline and a general store. Some yacht supplies, ice, provisions, and some ship chandlery may be obtained. The town wharf on the south shore close west of the bridge has 3 feet alongside its float landing.

The mean range of tide is 9 feet.

East Boothbay (P.O.) is a village on the west bank of the river, about 3 miles above the mouth. The large buildings of three boatyards, one inactive, are prominent. Three wharves are in general use, and have float landings and berthing space with electricity and with 10 feet alongside. Gasoline, diesel oil, and water are piped to them. There are three marine railways, the largest with a capacity of 100 tons can haul out craft up to 110 feet in length and 12 feet in draft. A mobile 12-ton travel-lift is available, and a 15-ton locomotive crane. Open, and covered, dry, and wet winter storage is available at the yards; craft up to 200 feet in length and 1,000 tons in weight can be built.

The two active yards are equipped with complete facilities for hull and engine repairs, and have machine, carpenter and pipe shops. Twelve guest moorings are maintained, and restrooms are available at the yards. Ice, provisions, marine hardware, and ship chandlery can be obtained. Taxi and bus transportation, car rental, and ramps are available; there is telephone and telegraph communication.

The third yard was inactive in October 1958, its piers being used for layup berthing. There are several wharves with float landings; one, with a seafood restaurant on it, is the landing room which boat trips are made about the area in the summer. There are picnic areas, swimming and parking in the vicinity of the village.

The controlling depth in the harbor is about 7 feet.

Kelp Ledge, just south of the approach to the wharves and 150 yards from the shore, is bare at low water and is marked by a buoy just east of the ledge.

At **The Narrows,** 1.3 miles above East Boothbay, the channel is contracted to a width of 100 to 150 yards, and the tidal currents are strong with swirls. **Western Ledge,** a rock awash 550 yards south of **Fort Point,** in midchannel, is marked by a buoy to the southeast; the buoy tows under at full current strength.

Eastern Ledge, extending 100 yards from the eastern shore, is a rock with 2 feet over it. A buoy marks its west side. This buoy almost tows under during full strength of the current. On the west side of The Narrows is a ledge, mostly sunken, extending 250 yards southwestward and 75 yards eastward from Fort Point. There are other submerged ledges in this vicinity.

At the **Back Narrows** the channel is foul with rocks and is crossed by an overhead power cable with a permit clearance of 40 feet. Fish wharves and private float landings are in the two coves westward of **Fort Island.**

Seal Cove and **Long Cove,** on the east side just above The Narrows, have many unmarked dangers, and are seldom entered. An overhead power line having a permit clearance of 40 feet crosses Seal Cove about 400 yards south of **Hodgsons (Plummer) Island.**

Clark Cove, on the east side, 2.5 miles above The Narrows, is a broad bight, shoal near the shores.

Pleasant Cove is on the western shore of the river opposite Clark Cove, and makes in nearly 1.5 miles southwestward. Good anchorage can be had in the mouth of this cove just northwestward of **Carlisle Point,** in 15

to 30 feet, soft bottom. **Pleasant Cove Ledges,** northward of the cove, are covered at high water and are marked by a buoy just northward of them. There is a private float landing in the cove.

Damariscotta (P.O.), on the east bank, and **Newcastle** (P.O.) on the west bank of the river about 14 miles above the mouth, are connected by a fixed highway bridge with a clearance of 9 feet. The two towns are on a branch of Maine Central Railroad.

There is little traffic by water, except some fishing and yachting. The two remaining wharves were in disrepair in 1958. The float landing of the Twin Village Yacht Club on the west side of the bridge is reported to have 10 feet of water at it. Water and restrooms are available at the club and five guest moorings are maintained.

Gasoline, oil, diesel oil, provisions, ice, and some ship chandlery are available nearby.

The towns have a hospital, markets, and telephone and telegraph communication.

A boatyard on the west bank below **Jenks Point,** has a marine railway and can build or haul out for hull and engine repairs, craft up to 42 feet in length and 8-foot draft. Open and covered dry winter storage is available at the yard; and gasoline, oil, paint, marine hardware, and some supplies are obtainable. The yard has a float landing, dry at low water.

Anchorage can be had southeastward of the yacht club landing in 10 to 20 feet.

Booth and **Linekin Bays** are included between **Linekin Neck** and Fisherman Island on the east and **Southport Island** on the west. They form the approach to the town of Boothbay Harbor and numerous smaller summer resorts. They are frequented by many vessels and by a large number of fishing and pleasure craft in summer.

Islands and rocks extend 4 miles south-southeastward and 7 miles southwestward from the southwest end of Linekin Neck. The ground is very broken, rocks rising abruptly from deep water.

Only the important areas have been examined by means of a wire drag. Accordingly, vessels should avoid crossing this area. A lighted whistle buoy is at the southwest end of the broken ground, and deep-draft vessels passing along the coast should pass outside of it.

Bantam Rock, the most southerly visible danger, is 1.4 miles southwestward of the south end of Damariscove Island. The wreck of the S.S. HARTWELSON, broken in two parts on Bantam Rock, is no longer visible. The rock bares at low water; it is marked on the southwest side by a buoy.

Damariscove Island is 1.7 miles long, bare, and nearly divided in the middle. **Damariscove Harbor,** at the south end, is used as a small-boat harbor by local fishermen. An inactive Coast Guard station is on the west side of the harbor. Two lookout towers are on the highest parts of the southerly section of the island.

A fairway gong buoy is 0.5 mile south of the entrance to the harbor. **The Motions,** extending 0.3 mile south-southwestward of the southwest end of Damariscove Island, bares at low water. An unmarked 32-foot shoal is 0.8 mile southward of the southeast end of the island.

Fisherman Island, northeastward of Damariscove Island is bare. A large stone house on the highest part of the north section of the island shows up prominently from all directions.

Ram Island, on the south side of Fisherman Island Passage, is a grassy island marked on the northwest side by **Ram Island Light (43°48.2′ N., 69°36.0′ W.),** 36 feet above the water and visible 11 miles, shown from a tower with the bottom 20 feet painted gray, and the upper part white, connected to the shore by a bridge; a fog signal is at the light. The light has two white sectors which cover two approaches to Fisherman Island Passage; the eastern from **256°** to **263°,** and the southwestern from **027°** to **049°.**

The Hypocrites are two low, bare rocks eastward of Fisherman Island. **Smedrick Ledge,** extending 0.3 mile south-southwestward from The Hypocrites is marked by a daybeacon near its southern end. A buoy is off the northern end of the ledge extending north of The Hypocrites.

The Cuckolds are two bare islets off **Cape Newagen,** the southern extremity of Southport Island, on the west side of the entrance to Booth Bay. The easterly islet is marked by **The Cuckolds Light (43°46.8′ N., 69°39.0′ W.),** 59 feet above the water and visible 13 miles. It is shown from a white octagonal tower on a dwelling; a fog signal and radiobeacon are at the light. When approaching The Cuckolds, the easterly islet is more prominent and appears to be the larger and higher of the two.

Cape Harbor, between Cape Island and Cape Newagen, accommodates small craft; yachts and fishermen use it mostly. **Cape Island** is wooded in the center. **Newagen** (P.O.) is a village on the harbor. Two entrances serve the harbor. The easterly one, leading between **The Ark** and Cape Newagen, reported to have a depth of 3 feet, is used by fishermen in good weather, but should not be attempted by strangers without local knowledge.

The main entrance from the westward, between Hunting Island Daybeacon and the shore, has a depth of about 10 feet. Pass north of Hunting Island Daybeacon because the passage between **Hunting Island** and Cape Island is foul.

Depths in the harbor are from 6 to 16 feet. There is a town wharf and float landing with 4 feet alongside, and a service pier with gasoline available that has 4 to 6 feet alongside. There is a large summer inn in the village and there are also many summer homes. The inn also maintains a float landing in summer on the southwest side of the harbor.

Squirrel Island (P.O.), in the middle of the entrance of Booth Bay, is an important summer resort. It is wooded and has many large homes. Submerged pipes and cables carry fresh water, power, and telephone lines to the north end of the island from the southern tip of Spruce Point. The ferry from Boothbay Harbor lands passengers, mail, and freight at a float in the northerly

of the two coves on the west side of the island. A ledge extending northwestward from the island is marked by a lighted buoy.

Squirrel Cove, the southerly of the two coves on the west side, is sometimes used as an anchorage by small craft. A float landing in the cove has 8 to 10 feet alongside. A daybeacon marks the ledge at the south side of the entrance.

Linekin Bay is northeastward of Squirrel Island, between Linekin Neck and Spruce Point. The principal dangers are buoyed. Good anchorage can be found, the depths being 60 to 72 feet in the lower part of the bay, and 30 to 36 feet in the upper portion. There are several private float landings.

Spruce Point Ledges, bare at low water, are on the northern side of the entrance; they are marked by two buoys at the south and north ends. The better entrance is between the southern buoy and **Negro Island.**

In the narrow entrance between the northern buoy and Spruce Point, give the point a berth of over 150 yards. A **024°** course with the southeast point of Squirrel Island astern will lead to the head of Linekin Bay.

Ocean Point (P.O.), the point and village at the southern entrance to Linekin Bay, is marked by many summer homes and hotels. A public wharf and float landing with 10 feet alongside is maintained in **Card Cove** 700 yards north of this point. A rock with 2 feet over it is about 50 yards southwestward of the float.

South and southwest of the point, **Card Ledge, Dictator Ledge,** and **Gangway Ledge,** the main dangers in **Fisherman Island Passage,** are buoyed. The broken bottom extending southwest of Dictator Ledge to **Wylie Rock** should be avoided.

The principal dangers of Linekin Bay inside Spruce Point Ledges include: **Cabbage (Independence) Island,** wooded and with a house in the center; **Tibbits Ledge** with 8 feet over it, marked on its southwestern side by a buoy; **Holbrook Ledge,** bare at one third tide and marked on its west side by a buoy; a rock with 12 feet over it 200 yards westward of the south end of Holbrook Ledge; **Seal Rock,** bare at half tide and marked on the east by a buoy; a depth of 19 feet about 150 yards east of the buoy; a rock awash reported 120 yards 032° from Seal Rock, which several boats have reported striking in recent years; and a ledge on the east side surrounding **Perch Island** marked by a buoy at the southwest end.

Fish Hawk Islet has several trees, and a ledge bare at half tide extends southward of it. The narrow channel westward of Seal Rock should be used with caution. There are numerous unmarked rocks at the head in the vicinity of **Bayville** (P.O.) and **Murray Hill. Spruce Point** is wooded.

East of Tibbits Ledge is a yacht yard which builds craft up to 55 feet in length and manufactures marine hardware. The yard has a marine railway and a machine shop but does not solicit repair work. There is a depth of 7 feet at its float landing, and the yard maintains three guest moorings.

Capitol Island, on the west side of Booth Bay, is connected at its northern end by a footbridge to Southport Island. There is a private float landing at the bridge. Capitol Island (P.O.), a colony of summer homes is on the island. Daybeacons mark the ledges off the south and east side of the island.

Pig Cove, between the island and Southport Island has anchorage in 11 to 63 feet for three-fourths of its length but is shoal and foul at its northern end above the narrows. Fish wharves, a lobster pound, and a number of private float landings are in the cove. There are no facilities.

Burnt Island is partly wooded and marked on the southeast side by **Burnt Island Light (43°49.5′ N., 69°38.5′ W.),** 61 feet above the water, visible 13 miles, and shown from a white conical tower with covered way to a dwelling; a fog signal is at the light. White sectors in the light, from **307°** to **316°** cover the fairway in the approach eastward of Squirrel Island from Fisherman Island passage, and from **355°** to **008°,** the approach westward of the island from the south and westward.

Mouse Island, northward of Burnt Island, is wooded; it has a private float landing on the north side with a depth of about 12 feet. There is a pier and float landing on the east side of the island and several houses on the island.

Chart 230.—Boothbay Harbor, a town and harbor, at the head of Booth Bay, is an important summer resort and yachting center. It is one of the best anchorages on the Maine coast. It also has important fishing and boat building industries. A number of excursion, sightseeing, charter and party sport fishing boats operate from the harbor to the outlying islands and surrounding waters in the summer months. The harbor is spacious, has good holding ground, and is well sheltered.

The tower and buildings of the U.S. Fish and Wildlife Service fish hatchery and laboratory on **McKown Point,** the shipyard on **McFarland Point,** the dome of the building resembling a lighthouse on **McFarland Island,** and the foot-bridge across the head of the harbor are all conspicuous.

Anchorage can be found in 24 to 42 feet for large vessels in the outer harbor northward of Tumbler Island and off McKown Point. The inner harbor has depths of from 7 to 24 feet. The anchorage most used by small craft is on the northwest side of the inner harbor, northeastward of McFarland Island, where there are generally depths of from 10 to 12 feet, when clear of the ledge around the island.

Most craft anchor off the wharves, but there are numerous private moorings, guest moorings maintained by the yacht club, and those for hire by the various service facilities. However, it is sometimes difficult to secure adequate swinging room there. Strangers can usually obtain permission to use, or hire, one of the unoccupied moorings.

Dangers.—The approaches to the harbor are generally

deep and clear with most of the dangers marked. **Tumbler Island Ledge,** off the west side of Spruce Point, has 9 feet over it and is marked on its west side by a buoy. A lighted buoy, about 225 yards west-northwestward of **Tumbler Island** marks the ledges extending westward and northwestward of the island. The island is wooded; has a house on it, and a pier with float landing extending from its northeastern end.

The passage between Tumbler Island and Spruce Point should not be attempted, as it is shoal and foul; strangers should not anchor there.

Clam Rock, about 700 yards northeastward of Tumbler Island, close to the shore, is unmarked, as are 10- and 12-foot rocky ledges, 250 yards southwestward, and 150 yards westward, respectively, of the rock. A 14-foot rocky ledge, about 300 yards southwestward of McFarland Island is unmarked, but the ledges surrounding the island are marked on the south and east sides by buoys. In the inner harbor, a ledge extending from the eastern shore is marked by a buoy.

In summer the inner harbor is nearly filled with all types of fishing and pleasure craft. At night, many of these are often unlighted, and great care should be exercised in approaching the anchorage to avoid fouling them or any of the numerous unoccupied moorings, which also are often unlighted. The footbridge across the head of the harbor has a small drawspan with a clearance of 4 feet. The town float landing at the draw has 10 feet alongside.

Channels.—Two deep natural channels lead into the harbor. The easterly and widest leads between Spruce Point, on the east, and Squirrel, Burnt, and Mouse Islands on the west. The westerly one leads between those islands and Southport Island on the west but is narrow in places. Most of the dangers are marked and have been described. The chart and the aids if carefully followed should be sufficient guidance for strangers to enter at any time.

Tides and currents.—Tidal currents have little velocity in the harbor. The mean range of tide is 8.8 feet.

Ice.—In severe winters, ice occasionally obstructs navigation above Tumbler Island during February and March. In normal winters the harbor is free of ice to the footbridge.

See Appendix for **storm warning displays.**

Pilotage is not compulsory, but pilots are available to take strangers through restricted or difficult passages such as the inside passage through Townsend Gut and Sasanoa River to the Kennebec River.

Moorings in the harbor are under the supervision of the **harbormaster** who can be reached through the town office or any of the service facilities along the waterfront.

Supplies.—There are numerous service wharves, almost all with float landings, which have depths of from 4 to 15 feet alongside. Diesel oil, gasoline, and fresh water are piped to most of the wharves; ice, provisions and ship chandlery can be obtained. Overnight berthing can usually be had at most of the service facilities or at one of the moorings maintained by them.

The Boothbay Harbor Yacht Club maintains 10 guest moorings, and there is a depth of 10 feet alongside its float landings. Restrooms and a snack bar are available at the clubhouse. Laundromats and parking are available on the waterfront.

The port is well found and almost any service required by cruising craft is obtainable. There is a post office, library, and hospital in the town; markets, restaurants, hotels, motels and lodging are available. Charter and party boat services are available, and a ramp for launching small boats from trailers. Numerous excursion and sightseeing boats and launches operate from the harbor, and around the outlying islands and waters as far as Pemaquid Point and Monhegan Island.

There are a number of ship, boat building, and repair yards, the largest of which has two marine railways, one with a capacity of 600 tons. Craft up to 170 feet in length and 16-foot draft can be hauled out. General hull, engine, electronic, and electric repair can be made. Dry and wet, open and covered storage is available at the various yards, and most maintain guest moorings. The shipyard has a 25-ton crane and berthing space with depths of 4 to 15 feet alongside.

Telegraph, telephone and bus communications are available. Ferry service to the outlying islands is maintained throughout the year.

The **Inside Passage** from Boothbay Harbor to Bath is about 11 miles long and leads between the islands located between Boothbay Harbor and Kennebec River, forming an inland passage from Boothbay Harbor to Bath. The passage is used by excursion boats, yachts, and fishing boats.

The aids are colored and numbered for passage westward with the exception of Cameron Point Light, on the north end of Southport Island. The structure of the light is painted white. This is one of the most difficult places to make in the thorofare, and craft entering from the westward at this point should be careful to pass southward of the buoy marking the ledge extending southward from Indiantown Island.

The channel is very narrow in places, has strong tidal currents, and is much obstructed by rocks and shoals. Though most dangers are marked, strangers drawing 7 feet or more should not attempt it at low water. The passage leads through Townsend Gut, across Sheepscot River, and through Goose Rock Passage and Knubble Bay into Sasanoa River.

Goose Rock Passage is marked by a directional light. About midway through Sasanoa River, the channel crosses the southern part of Hockomock Bay and then continues through the Sasanoa River, coming out in the Kennebec River opposite the city of Bath. In 1958 the least depth in Sasanoa River was 7 feet at the southern end of Hanson Bay and near the northern entrance to the river. In the spring logs and driftwood may be present.

Two highway bridges cross the thoroughfare. The one at Townsend Gut has a swing span with a clearance of 10 feet; operating regulations are given in § 203.5,

Chapter 2. The fixed bridge over Sasanoa River near its junction with Kennebec River has a clearance of 50 feet.

Directions.—This passage is narrow and crooked, has strong tidal currents, and requires local knowledge to carry the best water. Strangers on larger vessels or yachts should pick up a pilot at Boothbay Harbor or Bath. With the aid of Chart 230, strangers in small craft drawing 7 feet or less should be able to go through. The best time is on a rising tide. The channel is well marked but careful navigation is required.

Caution.—At strength of current in the narrow places the buoys are often run under for short periods.

The thoroughfare is usually closed by ice for about two months but in mild winters has been known to remain open all winter. Several summer resorts and other landings are along this thoroughfare.

Townsend Gut is a narrow, crooked thoroughfare connecting Boothbay Harbor with Sheepscot River. There are unmarked rocks with little depth close to the channel. A rock with 5 feet over it is reported to lie about 75 yards southeastward of the drawbridge, which can be avoided by keeping lined up with the draw and avoiding being set to the eastward while waiting for the draw to open.

Deckers (Thompsons) Cove is crossed by a fixed bridge with a clearance of 7 feet. East of the north end of the bridge is a former fish wharf with a depth of 17 feet alongside, at which large yachts are moored for winter storage. There are several boatsheds in the cove and float landings.

Southport (P.O.) is a village and summer resort on the west side of the gut near the western end. There are numerous float landings on both sides of the gut.

Hodgdon Cove, on the northeast side of the gut opposite Southport, is shoal and foul at the head and around the edges with numerous sunken rocks, but affords good sheltered anchorage in from 12 to 27 feet, mud bottom, in the middle of the outer part of the cove.

Cameron Point Light, 21 feet above the water, shown from a white steel structure with a small white house, marks the ledge extending northward from Cameron Point, the northern extremity of Southport Island. The south end of the drying ledge extending southward from **Indiantown Island** is marked by a buoy.

Isle of Springs is a summer resort on Isle of Springs at the north end of Townsend Gut. The island is wooded and has an elevated tank at its summit. The ledge extending off the north end of the island is marked by a daybeacon. There is a wharf with float landing, with 10 feet alongside, on the northeastern side of the island from which, in summer, a private motorboat ferry runs to the southwest end of Sawyer Island.

Sawyer Island is connected to the mainland by a fixed highway bridge at its southeast corner; the clearance is about 2 feet. The current is strong in this locality. It is also connected at the northeast end to the south end of Hodgdon Island by a fixed highway bridge with clearance of about 2 feet.

Goose Rock Passage leads from Sheepscot River into Sasanoa River northward of MacMahan Island, and forms a part of the inside route. It has ample depth but is narrow in places; principal dangers are marked.

At the western end of the passage, **Goose Rock Passage Light,** 16 feet above the water and shown from a white triangular tower on a caisson, marks the best water through the passage and into Knubble Bay. **MacMahan Island Ledge,** a drying reef off the northeastern point of **MacMahan Island,** is marked by a daybeacon. **Six-foot Rock,** off the northwest corner of ths island, is marked by a buoy on its north side.

Boiler Rock, with 3 feet over it and marked by a buoy on its southeast side, is at the western end of the passage, about 150 yards southeastward of **Goose Rock,** a drying rock, which gives the passage its name. An intensified beam in Goose Rock Passage Light on the bearing **247°** marks the best water past these dangers. Another intensified beam in the light on the bearing **165°** leads up the Sasanoa River from the western end of the passage into Knubble Bay.

Little Sheepscot River is a narrow passage westward of MacMahan Island leading from Sheepscot River into Sasanoa River. The channel is narrow, being less than 50 yards wide at its narrowest part. The best entrance from the southward is south of **Turnip Island.** Craft of more than 4-foot draft should avoid passing through the channel between Turnip Island and the southern end of MacMahan Island as shoaling to depths substantially less than charted has been reported.

Little Sheepscot River is marked by only one buoy, about midway through the passage, marking **MacMahan Ledge.** Another buoy at the northern end, marking **Six-foot Rock** should be passed on the west side when entering Goose Rock Passage from Little Sheepscot River. There is an unmarked drying ledge, with two rocks which bare 4 feet, on the west side of the channel, about 200 yards southwestward of the buoy marking MacMahan Ledge. Two float landings are on MacMahan Island eastward of it.

MacMahan (P.O.) is a summer resort on the west side of MacMahan Island. Communication is available with Robinhood by a small motorboat ferry.

Sasanoa River, an estuary leading from Sheepscot River to Kennebec River, north of Georgetown and Arrowsic Islands, has numerous coves and bays, none of which are of commercial importance, making off northward and southward. The general trend of this river is northwest and southeast.

The principal coves and bays making southward are **Robinhood Cove, Riggs Cove,** and **Hall Bay.** Northward are **Heal Cove** and **Hockomock Bay. Montsweag** and **Brookings Bays** lead northward from Hockomock Bay. Montsweag Bay separates Westport Island from the mainland and joins the Sheepscot River at Wiscasset through Back River.

Knubble Bay is the broadest part of the river after passing Robinhood Cove and **Knubble,** before entering Hockomock Bay when coming from eastward. **Lower**

(Great) Hell Gate is the crooked passage from Knubble Bay into Hockomock Bay. **Upper Hell Gate** is about 2 miles from the western entrance to the river. This, the narrowest part, is only about 60 yards wide.

Halftide Ledge, about 400 yards southeastward of Upper Hell Gate, is marked by a daybeacon. In 1958, shoaling to 4 feet was reported about 50 yards south of the daybeacon. A rock awash at low water was also reported on the southern side of the channel about 150 yards 190° from the daybeacon. Extreme caution should be exercised in this area.

Tides and currents.—The mean range of tide in Sasanoa River is 8.8 feet. Tidal current data for three stations in the river, namely Upper Hell Gate, Lower Hell Gate, and the western end of Goose Rock Passage will be available beginning with the 1961 Edition of Tidal Current Tables, Atlantic Coast of North America. An ebb current, having a velocity of 9 knots, has been observed off the daybeacon marking **The Boilers** in Lower Hell Gate. At Upper Hell Gate, the current usually ebbs for a period of from 8 to 9 hours.

The fixed bridge at the western end of Sasanoa River has been discussed in connection with the Inside Passage from Boothbay Harbor to Bath.

Robinhood (Riggsville) (P.O.) is a village on the western side of the entrance to Robinhood Cove. There is a marina and yacht yard with a mobile 25-ton capacity travel-lift which can haul out for general hull and engine repairs, or dry, open or covered storage, craft up to 55 feet in length, 16-foot beam and depth up to 18 feet; electric and electronic repairs can be made. The yard also has a small two-ton hoist.

Gasoline, diesel oil, and water are available at a service float with 12 feet alongside. Overnight berthing is available at the wharf with 15 feet alongside, or at the floats with 10 to 12 feet alongside. There are three guest moorings usually available. Showers, restrooms and telephone are available at the marina; ice, provisions, bottled gas, and ship chandlery are also available. There is a restaurant and lodging; parking, picnic areas, and swimming are nearby. A small motorboat ferry carries mail and passengers to MacMahan Island.

There is good anchorage in 20 to 35 feet, blue clay bottom, northeastward of the wharf. The harbor is reported to be ice free.

Charts 230, 314.—Back River which also connects Sheepscot River to Kennebec River crosses Sasanoa River at Hockomock Bay. This river has a general north and south direction. South of Hockomock Bay the river separates **Arrowsic** and **Georgetown Islands,** is unmarked, and is crossed by a fixed highway bridge with a clearance of 8 feet. Between the bridge and Hockomock Bay the river is shallow.

North of Hockomock Bay the channel is marked by buoys and daybeacons, and leads through Montsweag Bay, the upper part of the river, and Cowseagan Narrows, separating Westport Island from the mainland, and joins the Sheepscot just below Wiscasset.

It is reported that the incoming tide up Montsweag Bay meets the tide of Back River in the vicinity of **Young Point.**

Currents are strong and erratic through the river, and the ledges and shoals in **Cowseagan Narrows** make the channel quite narrow at this point. A fixed bridge and causeway crossing the narrows has a channel opening with a horizontal clearance of 20 feet and a vertical clearance of 9 feet.

The narrow opening in the causeway has constricted the flow of the river and created a fall of as much as 2 to 3 feet, reducing the vertical clearance through the bridge a like amount. It has also been reported to have affected the tidal flow and created added turbulence as far south as Lower Hell Gate and west to Upper Hell Gate in Sasanoa River. Passage through the narrows should not be attempted without local knowledge, then only by small boats and at slack water.

Westport Island is 12 miles long and about 1.7 miles wide, and is wooded. It has little commercial importance. There are a number of summer homes and camps on the island. A general store is on the main road about 1.5 miles south of the bridge across Cowseagan Narrows. Gasoline, provisions, and some supplies can be obtained there.

Old ferry landing ramps still remain on both sides of Back River about a mile below the bridge. They could be used for launching small boats from trailers, as the road approaches on both sides are hard top, and in 1958 were in good condition, although steep in grade.

Chart 314.—Sheepscot River is the approach to several small villages in the lower end and to the town of Wiscasset, 14 miles above the entrance. The entrance is about 5 miles northeastward of Seguin Island, between The Cuckolds and Griffith Head. The channel has a depth of about 30 feet to Wiscasset and is navigable for small vessels at high water for about 4 miles above Wiscasset to the village of Sheepscot.

Large tankers drawing up to 30 feet occasionally carry oil to the power plant on **Birch Point,** 0.6 mile below Wiscasset. There is a 25-foot shoal in midchannel in the bend below Wiscasset, about 270 yards south-southwestward of the tower of old **Fort Edgecomb** on the southwestern end of **Davis Island.**

Anchorages.—Ebenecook Harbor is the first anchorage available for large vessels entering the river. Above **Stover Ledge,** anchorage can be had in the channel, the depths being usually 72 feet or less. **Colby Cove,** in the west bank about 2.2 miles above Cross River, affords anchorage in 48 to 60 feet; Merrill Ledge Daybeacon is northeastward of the anchorage. The anchorage at Wiscasset is below the bridge near the town wharves.

Pilotage is not compulsory, but pilots are available at Boothbay Harbor and West Southport. They will meet vessels off Seguin Light, or at the lighted bell buoy off the entrance to the river, as requested.

The channel in Sheepscot River is deep and the principal dangers are marked. It is a region of rocks and ledges, many of them rising abruptly from deep water.

There are several unmarked rocky shoals with depths of 20 to 30 feet near the middle of the river southward of Bull Ledge. The river should be navigated with extreme caution. With the aid of the chart and following the aids little trouble should be experienced in reaching Wiscasset.

Tides and currents.—The mean range of tide varies from about 8.9 feet at the entrance to 9.4 feet at Wiscasset.

The tidal currents in the river generally set in the direction of the channel and have considerable velocity in the narrow parts. At the entrance of Cross River the flood sets onto **Quarry Point.** The ebb sets onto **Clough Point.** On the falling tide a strong set to westward is felt near Bull Ledge, and a strong set to the eastward near Middle Ledge. These sets are not noticeable on a rising tide. There is a strong ebb current near the entrance to Cross River. Off Barter Island the tidal current has an average velocity at strength of about 1 knot. See Tidal Current Tables for predictions.

Ice usually does not interfere with navigation below Wiscasset. The river above Wiscasset is usually closed in winter.

The Cuckolds Light and Cape Harbor, on the east side at the entrance, are described in the previous section. Rocks, bare and sunken, extend 0.5 mile westward of the point in this vicinity.

The Sisters, 1.5 miles from the northwestern shore at the entrance to Sheepscot River, are three small, bare rocks with shoals surrounding them. The westerly rock is marked by a daybeacon.

Tom Rock, 0.6 mile south of The Sisters, is bare at low water and marked by a buoy on the southwest side.

The Black Rocks, 1 mile from the northwestern side of the entrance to Sheepscot Bay, are several bare and sunken rocks that extend over a distance of about 0.7 mile. The highest bare rock in the middle of the group has an elevation of 15 feet. The southern part of the ledge is reported to bare just after the start of the ebb and should be given a wide berth.

The channel between The Black Rocks and the buoy marking **Sloop Ledge,** 0.4 mile northwestward, should be used with caution. The area between the buoy and the northern shore is very broken and should not be crossed.

Griffith Head, on the west side, at the entrance of Sheepscot River, is a white, rocky head. **Outer Head,** a bare rocky island, is 200 yards eastward. A buoy, 0.4 mile off the island, marks **Griffith Head Ledge.**

Griffith Head and a considerable amount of the surrounding area are included in **Reid State Park,** a public camping and picnic area, open in the summer months. There are swimming beaches, bath houses, showers, restrooms, and a snack bar. There are no landings. A dam and highway bridge crosses the mouth of the creek at the head of the cove on the north side of the head. The cove is foul.

Lower Mark Island, on the eastern side just inside the entrance to Sheepscot Bay, is wooded, and is a good landmark. A ledge bare at low water is 150 to 350 yards eastward of the island. Broken ground with 22- and 23-foot spots extends about 0.6 mile northwestward of the island. The 23-foot spot is marked by a gong buoy.

Cat Ledges are rocks in a group, the higher ones bare, located 0.5 to 1 mile northward of Lower Mark Island. The outer ones are 0.4 mile from the eastern shore. The coves eastward of the ledges are foul and of no importance.

Harmon Harbor is a long, narrow cove making northward on the western side of the river about 1.5 miles above Griffith Head. It has good anchorage, except during southerly gales, in 24 to 36 feet, but has a very narrow entrance between a bare ledge near the west shore and a dangerous reef, bare at low water, extending 275 yards southwestward from **Wood Island,** on the eastern side of the entrance south of **Dry Point.** A buoy marks the southwest end of the reef. There are no public landings in the harbor. There is a prominent hotel on the west side near the middle of the harbor, and a small settlement at the head.

The best water in entering leads 100 yards eastward of the middle of the bare ledge on the west side at the entrance, close-to and westward of the buoy.

Five Islands Harbor, a narrow passage between Five Islands and the western shore, forms a secure harbor for small craft, with depths of 18 to 30 feet. The main entrance is northward of **Malden Island,** the largest wooded island, which has a colony of summer homes on it and a private float landing on its northwestern side. It is connected to the island close westward of it by a bridge. In the middle of the entrance is a rock covered by 11 feet and marked by a buoy. In entering, craft can pass the buoy close-to on either side, but the best water is reported to be on the north side.

Boats also can enter the harbor from the northwestward, following the western shore and passing inside of all islands and shoals. **Crow Island Ledge,** extending west from Crow Island at the northern entrance is marked by a daybeacon. Northwestward of the daybeacon, an unmarked ledge makes out from the Georgetown Island shore. Care should be taken to avoid it by favoring the Crow Island side of the channel and passing the daybeacon close-to on the west side. The southern entrance is nearly blocked by rocks and ledges that bare at about half tide, and should not be used without local knowledge.

Five Islands (P.O.) is a village on Georgetown Island on the western side of the harbor. There are several float landings. The main wharf, the town landing, has a depth of 16 feet at the float. Gasoline is piped to the float; provisions and some supplies can be obtained at a general store at the landing.

Gotts (White) Cove, close northwestward of Five Islands Harbor, has two float landings at a boatyard that has a marine railway capable of hauling out, for winter open and covered storage, craft up to 35 feet in length and 6-foot draft. Gasoline is piped to one of the floats. There are several private boatsheds in the cove.

Hendricks (Cozy) Harbor is a cove on the eastern side of Sheepscot River. The entrance is 0.4 mile southward of

Hendricks Head Light (43°48.4′ N., 69°41.4′ W.), 43 feet above the water and visible 11 miles, shown from a white square tower on the head.

A Federal project provides for an entrance channel 30 feet wide and 9 feet deep. In 1956 the project was completed and the project depth obtained. The channel is marked by two daybeacons and a buoy.

The harbor is frequented by local pleasure and fishing craft and in summer by many cruising yachts. The harbor, though small, is secure with depths of 3 to 9 feet in the anchorage.

The Southport Yacht Club in the harbor has 4 feet alongside its float landing. Restrooms are available at the yacht club, and guest moorings are maintained. A service wharf adjacent to the club landing, with 2 feet alongside its float landing, has gasoline and fresh water piped to the float.

A general store, restaurant, bowling alley, and telephone are on the wharf. Provisions, bottled gas, lobsters, and some yacht supplies can be obtained. There is a ramp; parking and picnic areas are in the vicinity.

The village of **West Southport** (P.O.) is near the harbor. There are fish wharves and private float landings in the harbor. A causeway and fixed bridge with a clearance of 3 feet connects Southport Island with **Pratts Island** at the south end of the harbor.

Chart 230.—About 6 miles of Sheepscot River is shown on this chart which is a large-scale of the inside passage from Boothbay Harbor to Bath. Chart 314 also shows this section; but its scale is smaller, and Chart 230 should be used if going into Ebenecook Harbor or any of the channels except the main river.

Ebenecook Harbor is an excellent anchorage for vessels up to 20-foot draft. Its entrance, about 1 mile above Hendricks Head on the eastern bank of the river, leads between Dogfish Head on the south and the Green Islands on the north. It is the first large anchorage available for craft entering the river. The entrance is narrow.

The southern part of the harbor divides into 3 arms, the outer sections of which afford good sheltered anchorage; but the inner sections to the heads are shoal and foul, and should be avoided.

Maddock (Middle) Cove, the westerly arm, has a large marina and yacht yard on its eastern shore. The yard has a wharf with float landings that have 8 feet alongside. Gasoline, diesel oil, and fresh water are piped to the floats; ice, provisions, bottled gas, bait, lobsters, some yacht supplies, and ship chandlery are obtainable. Overnight berthing is permitted and the yard maintains 20 guest moorings. Restrooms and showers are also available.

The yard has a 20-ton travel-lift that can haul out craft up to 55 feet in length and 16-foot beam, for open or covered dry winter storage. General hull, engine, electric and electronic repairs can be made, and the yard has complete machine, paint, and carpentry shops. A ramp for launching small craft is at the yard. There is a telephone on the wharf. A fish wharf, restaurant, picnic and parking areas adjoin the yard. Anchorage can be had off and to the northwestward of the marina in from 8 to 16 feet, in midchannel. A fish wharf and lobster pound is on the west side of the cove opposite the marina.

Pierce Cove, the middle arm, has a private float landing on its west side.

Love Cove, the eastern arm, has excellent anchorages in 8 to 12 feet in midchannel southward of the submarine power and telephone cables crossing the entrance to the cove to Little Island, the smaller of the two islands on the western side of the entrance to the cove. Three private float landings are on the cove, and a small private marine railway is at the head of the cove which is shoal and foul.

Entering Ebenecook Harbor vessels should give the eastern shore of Sheepscot River a berth of 300 yards for 1 mile above Henkdricks Head until up with **Dogfish Head,** which is rocky and grass covered with a low neck behind it. Pass in midchannel between Dogfish Head and the southern extremity of Green Islands, avoiding a 7-foot rock patch marked by a buoy just inside the entrance. Choose anchorage in any of the coves in the southern part of the harbor; or, if preferred, anchor in the northern part where desirable. A rocky unmarked ledge with 14 feet over it is about in the middle of the harbor.

Extending northward from Ebenecook Harbor to Sawyer Island is a channel, affording good anchorage in places, which is used by small pleasure craft in summer. The channel is a part of the Inside Passage used by local vessels between Boothbay Harbor and Bath. Navigation of its northern part, as well as the passages between the islands and ledges on its western side, requires some local knowledge.

The principal islands and rocks are: **Green Islands** are wooded; a rock bare at low water is 200 yards northeastward of them and is marked by a buoy on its southeast side; a bare ledge is between Green Islands and Boston Island; and a rock with 6 feet over it is 250 yards westward of the ledge.

Boston Island is high and partly wooded, and has several houses and a boat landing. **Spectacle Islands** are partly wooded. A rock bare at low water is 150 yards westward of their southwest end.

Townsend Gut, Isle of Springs, and Sawyer Island, on the eastern side of Sheepscot River, and Little Sheepscot River and Goose Rock Passage on the western side, are described under the Inside Passage.

Bull Ledge, 1 mile northward of Hendricks Head, is bare in one place at low water, and is marked at the south end by a buoy.

Middle Mark Island, a small, round, bare islet, is in the middle of a ledge 0.3 mile long located 0.3 mile from the western shore and 1.5 miles above Hendricks Head. **Mark Island Ledge,** with 7 feet on it, is 250 yards southwestward of the island. The main channel leads eastward of the island.

Middle Ledge, 600 yards eastward of the southern side of the entrance to Goose Rock Passage, has a least-found depth of 8 feet, but less depth has been reported on this ledge. A buoy marks its northern side.

Clous Ledge, 0.2 mile eastward from **Whittum Island,** wooded, at the entrance to Goose Rock Passage, is awash at half tide and marked by a daybeacon on the middle of the ledge and a bell buoy off its northern end.

Powderhorn Island, low and grassy, is on the eastern side of the river 2 miles above Hendricks Head. **Powderhorn South Ledge,** awash in places at low water, extends 0.3 mile southward from the island, and is marked at its south end by a buoy. A narrow channel is between the buoy and the north end of **Harding Ledge,** sunken and marked at its south end by a buoy.

Powderhorn Ledge, with 3 feet on it, is 200 to 350 yards northward of Powderhorn Island, and is marked on its northwestern edge by a lighted buoy.

Fourfoot Rock, on the west side of the channel about 0.2 mile northward of Clous Ledge Daybeacon, is marked on its southern side by a buoy.

Ram Island Ledge, awash in spots at half tide, is on the east side of the channel and extends 0.3 mile in a north-northeasterly direction from **Ram Islands** to the entrance to Back River. It is marked on its eastern side by a daybeacon, and a buoy, which also are guides to the narrow channel leading northward from Ebenecook Harbor.

Upper Mark Island is a low grassy ledge from which a shoal extends 600 yards northward toward Hodgdon Ledge.

Jewett and **Long Coves** are unimpartant coves on the west side of Sheepscot River westward of the entrance to Back River.

Back River is a shallow, narrow, and unmarked stream between **Barter Island** and the mainland. Its southern entrance is on the eastern side, about 3 miles northward of Hendricks Head; its northern entrance is from Cross River. Only small craft use it; local knowledge is required for its navigation. The entrance to Back River is marked by a buoy 350 yards westward of the southern end of Barter Island.

There are several private float landings on the south end of Barter Island, just inside the entrance. A drawbridge across the river between Hodgdon Island and the south end of Barter Island has a clearance of 6 feet; operating regulations are given in **§ 203.6,** Chapter 2.

Trevett (P.O.) is a small village at the Hodgdon Island end of the drawbridge. It has a general store. A fixed highway bridge with a clearance of 4 feet connects Hodgdon Island with the mainland.

Merrow, Miles, Tibbet, and **Gooseberry Islands,** all wooded, are on the eastern side of the channel in Back River. Merrow and Tibbet Islands are connected with the mainland by fixed bridges having small clearances. There is no traffic through them as the water is shoal and foul.

Tarbox Landing is a small settlement just north of **Tarbox Cove** on the west side of the Sheepscot River.

Hodgdon Ledge, 250 yards eastward of Tarbox Cove, is bare at half tide and marked on the southeast side by a buoy.

Stover Ledge, on the east side of the river about 1 mile northward of the southern end of Barter Island, dries at low water, and is marked by a buoy off its southwestern edge. A **measured nautical mile** on bearing **015°45′** is off the west side of Barter Island, about 1 and 2 miles, respectively, from the northern end of the island. Shore ranges on Barter Island mark the ends of the course.

Greenleaf Ledge, on the west side of Sheepscot River just south of the entrance to Cross River, is bare at half tide and marked by a buoy. Shoals fill the bight from the buoy to the western shore.

Chart 314.—Cross River empties into the east side of Sheepscot River about 6 miles above Hendricks Head. Its entrance is marked by a lighted buoy. It has a deep channel for over 1 mile to **Oven Mouth** where the river is confined to a narrow channel between high cliffs.

Cross River southeast of Oven Mouth requires local knowledge to navigate. Burleigh Hill Yacht Club, a boys camp, on the east side of Cross River, about 1 mile above Oven Mouth, has a float landing with 10 feet alongside. There are no facilities.

Merrill Ledge, 2.4 miles above the entrance to Cross River, is bare at half tide in the middle. At the south end it is marked by a daybeacon, and on the west side by a lighted buoy. The channel leads westward of it.

A rock with 13 feet over it is about 500 yards southward of **Clough Point,** the north end of Westport Island. The rock is on the west side of the river, a little eastward of a line connecting the buoy off Clough Point and the buoy just above **Hilton Point.**

There is an unmarked 25-foot shoal in midchannel in the bend at Clough Point, about 270 yards south-southwestward of the tower, or blockhouse, of old Fort Edgecomb, which is on the southwestern end of Davis Island. **Seal Rock,** 550 yards westward of Clough Point, is bare at half tide and marked on the north by a buoy. During times of strong currents the buoy is reported to tow under.

Montsweag Bay and Back River form a thoroughfare from Sasanoa River and Hockomock Bay to Sheepscot River near Wiscasset. They have been previously described under the Inside Passage. The thorofare is reported to be extremely hazardous due to the causeway and fixed bridge at Cowseagan Narrows, damming the waters and creating a fall at the bridge opening which is reported to limit the vertical clearances to less than 7 feet. Passage should not be attempted without local knowledge.

Wiscasset (P.O.) is a town on the west side of Sheepscot River 14 miles above the entrance. It is on U.S. Highway No. 1 and on a branch of the Maine Central Railroad.

The wharves are in ruins and there is virtually no commerce by water. The hulks of the two four-masted schooners HESPER and LUTHER P. LITTLE rest on the bottom alongside the wharf ruins.

The town landing and Wiscasset Yacht Club, both with float landings reported to have 25 feet alongside, are at

the south end of town below the wharf ruins. Gasoline and fresh water are piped to the yacht club float. Overnight berthing is permitted at both landings, and the yacht club maintains three guest moorings. A ramp for launching small boats is between the two landings.

Diesel oil can be obtained by tank truck; ice, provisions, bottled gas, bait, fishing tackle, yacht supplies, and some ship chandlery can be obtained in the town. Hotels, restaurants, motels, drug and hardware stores, and markets are nearby. Telephone, telegraph, bus, and taxi service are available.

The Whites Island Swimming Club with a float landing is about 200 yards southwest of the yacht club.

Anchorage in 25 to 30 feet in muddy bottom can be had south and southwestward of the landings. There are no repair yards, but minor engine repairs can be had at a nearby garage. There are ample parking facilities and picnic areas in the vicinity.

The Central Maine Power Company operates a large electric plant and a good pier with coal crane on **Birch Point,** 0.7 mile southwestward of the bridge at Wiscasset. The pier has depths of 31 to 33 feet alongside for a length of 750 feet. Large tankers occasionally discharge at the pier.

The highway bridge over Sheepscot River at Wiscasset has a swing span with a clearance of 10 feet. The railroad bridge 1 mile above Wiscasset has a bascule span with a clearance of 8 feet.

The depth is reported to be about 10 feet for 4 miles above Wiscasset to rapids in the river. Boats of about 4-foot draft can go through the rapids at high-water slack and for about 3 miles above. **Sheepscot** (P.O.) is a village just above the rapids. A fixed bridge crossing the river at Sheepscot has a clearance of 10 feet. The channel is unmarked above Wiscasset, and local knowledge is required for its navigation.

Marsh River, a tributary, enters the Sheepscot River about 2 miles above Wiscasset. Small craft are reported to go up the river for 3 or 4 miles salmon fishing. A fixed railway bridge about 2 miles above the mouth has a clearance of 22 feet.

Kennebec River.—The mouth of the Kennebec River is northward of Seguin Island and 20 miles eastward of the entrance of Portland Harbor. It is the approach to Bath, Augusta, Richmond, Gardiner, and smaller places. The river has some trade in coal and petroleum products. The deepest draft of colliers to Bath is 31 feet, and coastal oil tankers carry 15 feet to Hallowell, about 2 miles below Augusta. In 1958 there was no regular commercial traffic by water to Augusta, the head of navigation.

Channels.—The Federal project for improvement of Kennebec River provides for a channel 27 feet deep from the mouth to a point about 0.6 mile above the bridge at Bath; thence to Gardiner, a channel 17 feet deep at Beef Rock Shoal at the foot of Swan Island; thence 18 feet through rock at Lovejoy Narrows, and a channel from Gardiner to Augusta 11 feet deep.

The channel is maintained at or near project depth as far as Bath.

Anchorages.—The holding ground is poor at the entrance below Fort Popham; vessels should not anchor here unless forced to do so. If obliged to anchor when inside Pond Island, it is advisable to come to with a long scope of chain in the channel abreast the wharf in ruins just above the Coast Guard station. If the wind is not blowing strong a moderate-sized vessel may ride here if care is taken to keep the anchor clear. Strong tidal currents will be experienced.

Anchorage can be had on the eastern side of the channel southward of Kennebec River buoy 12 in 36 to 48 feet. On the eastern edge of the channel at the anchorage the depths shoal abruptly from 30 feet to a few feet. Drift ice coming down the river generally follows the western shore.

The best anchorage, and the one most frequently used, is on the western side of the channel off Parker Flats in 24 to 36 feet. Large vessels sometimes anchor on the eastern side in this area. Above Parker Flats, vessels anchor wherever they find good holding ground and suitable depth, keeping out of the strength of the current.

Regulations defining **anchorage** grounds at Bath are given in **§ 202.131,** Chapter 2. Special small-vessel **anchorages** are at Randolph and Augusta; limits and regulations are given in **§ 202.1, § 202.3,** and **§ 202.4,** Chapter 2.

Directions.—This is a region of rock and very broken ground, therefore strangers should proceed with extreme caution and avoid crossing broken ground where the charted depths do not substantially exceed the draft.

There are two approaches to the entrance, the eastern between Whaleback Rock and the shoals southwestward, and the western between Pond Island Shoal gong buoy and the shoals eastward. The eastern channel has a least found depth of 29 feet on a small spot easily avoided, and the western a least found depth of 24 to 30 feet on the sailing lines. Both are used, but vessels of more than 18 feet in draft usually enter by the eastern channel. The entrance has strong tidal currents and if the wind is opposed to the current an ugly chop sea is encountered which is at times dangerous for small craft.

The principal dangers in the river are marked, but the channel is narrow in places. The narrowest place below Bath is eastward of Pettis Rocks, where it is only about 100 yards wide. Some sections of the dredged channel between the south end of Swan Island and Augusta are not marked well enough to help strangers keep in them.

With the aid of the charts, small craft should have no trouble reaching Augusta. Vessels with a draft approaching the depth of the channel should employ a pilot. The channel above Bath is reported to be subject to considerable changes annually caused by freshets.

The presence of dead heads, known locally as **tide walkers,** are a constant hazard in the river, especially to small craft. These water-logged boom logs, weighted at

one end by parts of mooring chains, with one end down and the other end at the surface or just under, shift position with the tidal or river currents and are hard to detect, especially at night. A sharp lookout for them should be kept.

The main and deeper channel leads eastward of Swan Island. Just northward of Swan Island is the Richmond-Dresden State highway bridge with a draw.

Tides and currents.—The mean range of tide is about 8.4 feet at the entrance, 6.4 feet at Bath, 5 feet at Gardiner, and 4.1 feet at Augusta.

Tidal currents between the entrance and Bath have average velocities at strength of from 2 to 3 knots. Ebb velocities up to 4 knots have been observed and considerably larger velocities may be expected during freshets. Above Bath similar velocities are believed to occur but no definite information is available. The direction of the current at the entrance is influenced by strong winds, especially easterly gales. Current predictions for a number of locations may be obtained from the Tidal Current Tables.

Caution.—It has been reported that the current flows out of the Sasanoa River, at Preble Point, into the Kennebec with a violent surge that is felt across the river at the shipyard, so as to endanger vessels docking there. Extreme caution should also be exercised by vessels when approaching and lining up to pass upriver through the lift span of the bridge at Bath.

Freshets occur in March and April, and also after heavy rains in the fall, but are not dangerous to shipping unless accompanied by ice. A height of 9 feet above high water usually occurs several times a year at Augusta, but the height diminishes rapidly southward. During the freshets, pulp logs are sometimes washed over the dam above Augusta and present a serious navigational hazard, especially to small craft. Log booms are maintained at Brown Island and on the east side of the river below Shepard Point to facilitate recovery of the drifting logs. The booms are not lighted, but are outside the navigation channel.

Ice usually closes the river to navigation above Bath from December to April. Steamers are rarely delayed by ice below Bath.

Pilotage is not compulsory, but strangers in deep draft vessels should take a pilot to Bath, and all vessels proceeding above Bath should take one. Coastwise vessels bound for Bath seldom take a pilot but if proceeding above Bath usually take one aboard just above the bridge at Bath. Pilots are available at Bath and Hallowell. Vessels desiring a pilot should make advance arrangements with their agents for the pilot to meet them off Seguin Island or at the entrance to the river, as desired.

Towboats.—No tugs are stationed at Bath, but they can be obtained from Belfast or Portland.

The U.S. Public Health service maintains an **outpatient office** at Bath. Bath is a **port of entry** and marine documents are issued. **Immigration** is handled through the customs office at Bath. **Quarantine** is arranged from the Portland office.

Kennebec River formerly had a large trade in ice, and the ruins of many of the old ice wharves may still be seen along both banks of the river as far as Augusta. At present there is some traffic in coal, fuel oil, or petroleum products to Bath, Gardiner, and Hallowell.

Cape Small is the wooded point about 4 miles westward of the mouth of the river. The distinguishing marks are an elevated tank 1.4 miles northward from the end and visible from eastward or westward; **Bald Head,** a bare round knob on the west side of the point; and **Bald Head Ledge,** bare at half tide and marked by a daybeacon and a bell buoy.

Fuller Rock Light (43°41.7′ N., 69°50.1′ W.), 33 feet above the water and visible 8 miles, is shown from a white skeleton tower, on a low bare islet of the same name, about 0.3 mile southward of Cape Small. **Buttonwold Ledges** with a least depth of 11 feet, and **Bill Wallace Ground,** with a least depth of 19 feet, lie between Fuller Rock and Bald Head Ledge, and are unmarked. **Halibut Rocks,** an extensive ledge, with a least depth of 24 feet, about 0.6 mile eastward of Fuller Rock, are unmarked. There are submerged rocks and very broken ground which has not been closely examined in the vicinity of the cape.

Sprague and **Morse Rivers,** between Cape Small and the entrance of Kennebec River, are nearly bare at low water at their entrances, and seldom entered even by local boats.

The entrance to Kennebec River is somewhat obstructed by an area of islands and rocks and very broken ground, not closely examined, extending southward for a distance of 4.5 miles. The most southerly known danger is **Seguin SSW Ledge,** which has a least found depth of 33 feet; it is 0.5 mile southeastward of Seguin Island whistle buoy.

The other dangers outside of Seguin Island are **Mile Ledge,** with a least found depth of 20 feet and marked by a lighted bell buoy, and **Camel Ground,** 1 mile west-southwestward of Seguin Island Light, which has been cleared to a depth of 23 feet. Camel Ground is unmarked and the sea breaks on it in heavy weather.

Chart 238.—Seguin Island, 145 feet high, is grassy. **Seguin Light (43°42.5′ N., 69°45.5′ W.),** 180 feet above the water and visible 20 miles, shown from a white cylindrical tower connected to a dwelling, is on the summit of the island; a fog signal is at the light. This light is the most prominent mark in the vicinity.

Ellingwood Rock, 400 yards northward of the north end of Seguin Island, is a bare islet about 6 feet high.

Local Magnetic Disturbance.—Differences of as much as 8° from the normal variation have been observed in an area around Ellingwood Rock for approximately 1 mile in all directions.

Seguin Ledges, 0.5 mile northeastward of Ellingwood Rock, are about 5 feet high, and have submerged ledges extending 300 yards northeastward and southward from the bare ledge.

Pond Island, about 30 feet high, is a grassy island on

the west side of the entrance to Kennebec River. **Pond Island Light (43°44.4′ N., 69°46.2′ W.)**, 52 feet above the water and visible 12 miles, is shown from a white tower connected to a dwelling on the summit of the island; a fog signal is at the light.

Jackknife Ledge, with a depth of 8 feet is about 1.3 miles northwestward of Seguin Light. It is marked on the southeast by a buoy.

Pond Island Shoal is the rocky shoal southward and southeastward of Pond Island. It has depths of from 5 to 21 feet over it, and in heavy gales is covered with breakers. A gong buoy marks the southeastern end of the shoal, and is 0.7 mile south-southeastward of Pond Island Light. Vessels should not pass between this buoy and Pond Island. Small craft entering the river from the westward often cut across this shoal, but it is not advisable to do so in southerly weather, when a heavy chop is built up by the ebb, often causing heavy breakers to form on it.

Wood Island, 0.3 mile westward of Pond Island, is high and wooded. The channel between Wood and Pond Islands should not be used by strangers.

Whaleback Rock is a bare rock about 8 feet high on the eastern side of the entrance to the river and 0.5 mile eastward of Pond Island. A shoal extends about 100 yards southward from it. **Salter Island**, northward of Whaleback, is wooded. **Stage Island** is wooded.

Stage Island Bay, Sagadahoc Bay, and **Heal Eddy**, on the east side of Kennebec River at the entrance, are shoal inside, have no wharves, and are of little importance.

North and **South Sugarloaf** are high, rounded, bare, rocky islets in the middle of Kennebec River just inside the entrance. A ledge extends 100 yards southward from South Sugarloaf. **Jack Rock**, near the end of a ledge extending 125 yards northeastward from South Sugarloaf, is bare at low water and marked by a daybeacon.

A rock awash is about 100 yards southeastward of the daybeacon. Ledges marked by a buoy extend for 175 yards southward and another 125 yards northwestward from North Sugarloaf.

Popham Beach (P.O.) is a summer resort on the west side of Kennebec River just inside the entrance. Kennebec River Coast Guard Station is on the beach; its L-shaped wharf is located close northwestward of the fort. In 1958, only scattered piling remained of an old wharf in the bight southwestward of the fort; and a long pier, extending northward from Sabino Head, was in ruins. See Appendix for **storm warning** display.

Fort Popham is an unfinished and abandoned fort on Hunniwell Point. **Fort Popham Light (43°45.3′ N., 69°47.0′ W.)**, is shown from a 6-foot cylindrical iron stand on the parapet of the old fort. The light is most brilliant on the bearings 323° and 172° and diminishing in intensity around the remainder of the horizon; a fog signal is at the light.

Bay Point is a village on the east side of Kennebec River entrance, opposite Fort Popham. There are two service wharves; one L-shaped, has 9 feet alongside, and the other, a lobster wharf, has 4 feet. Gasoline is piped to both wharves and oil is obtainable at both wharves. Provisions and some supplies may be obtained in the village and water from nearby wells. Craft approaching these wharves should avoid getting too far northward, as a bar, which bares at half tide, extends nearly all the way across the entrance to Long Island Narrows from Gilbert Head.

Gilbert Head, the southern extremity of **Long Island**, is high and wooded except near the end, where there is a large white house. The house is very conspicuous and a good mark in hazy weather when surface aids are obscured, or not readily discernible.

Shag Rock, on the eastern side of the channel, between Gilbert Head and Cox Head, bares 3 feet at high water. It is marked by a daybeacon near its south end and a buoy off its northwest side. The wreck of a schooner stranded on Long Island, eastward of Shag Rock, is visible.

Cox Head is high and wooded. **Todd Bay**, on the east side of Kennebec River northeastward of Cox Head, is almost bare at low water.

Dix Island, 0.2 mile northward of Cox Head, has a drying ledge extending northward of it. A buoy is northward of the island.

Perkins Island, on the east side of the main channel 3 miles above the entrance, is wooded on the north end and bare on the south end. **Perkins Island Light**, 41 feet above the water, is shown from a white octagonal tower on the west side of island; a fog signal is at the light. White sectors in the light partially cover the fairways above and below the light. A 5-foot shoal, about 350 yards westward of the light, is marked on its southeast side by a buoy. **Perkins Island Ledge**, with a least depth of 7 feet, about 0.3 mile south-southwestward of the island, is marked on its west side by a buoy.

Parker Head is a village on the west side of the river westward of a prominent headland of that name. The approach to the village is by a narrow channel, shoaling gradually to about 3 feet. The channel is sometimes marked by bush stakes, and there are several old piling along its sides southeast of the former milldam. A buoy marks the easterly edge of shoal water extending about 0.6 mile north-northeastward of Parker Head.

Back River is a narrow, crooked, and unmarked thoroughfare connecting Kennebec River with Sasanoa River and Hockomock Bay. It is described with the Inside Passage. **West Georgetown** is a village on the east side of Back River, just inside its southern entrance, which is marked by a buoy. A ledge extends about 350 yards southwestward of **Crow Islands** which are in the middle of the entrance. A buoy is southwest of the ledge.

Seal Rocks, on the west side of the channel at the upper end of **Parker Flats**, are bare at half tide. A buoy is northeastward of them.

Phippsburg (P.O.) is a village on the west side of Kennebec River 5.5 miles above the entrance. A conspicuous white church spire in Phippsburg is a good leading mark for the reach from Bald Head to Squirrel Point.

Squirrel Point, the southwestern extremity of Arrowsic

Island, is marked by a light and fog signal. The light is shown from a white octagonal tower and is 25 feet above the water. A white sector between 322° and 332° covers the fairway.

Goat Island, northeastward of Phippsburg, is wooded, and the smaller islands near it are bare and grassy. The drying ledge extending southward of the island is marked by a buoy on its southeastern side.

Pettis Rocks, in the middle of the river 6.5 miles above the entrance, are awash in the highest part at extreme high water and marked at the south end by a daybeacon. This is a dangerous part of the river, and vessels inbound, after passing the southern end of Lee Island, should crossover to and favor the east side of the river to avoid the shoals extending from Pettis Rocks and Ram Island.

Ram Island, just northward of Pettis Rocks is low and bushy, and marked on the north end by **Ram Island Light,** 22 feet above the water and shown from a white skeleton tower. A reef bare at low water extends nearly 200 yards northwestward of the island. Vessels passing westward of the island sometimes ground on this reef.

Chart 230.—Indian Point, on the west bank of Kennebec River, about 0.4 mile above Ram Island, is low. A ledge with a depth of 7 feet on it, about 500 yards northward of Indian Point, is marked on its southeastern side by a buoy. At **Bluff Head,** 1 mile above Ram Island, the river narrows. The upper part of this section is marked by Doubling Point Lighted Range. The lights are shown from white octagonal towers.

This range passes very close to and eastward of **Lithgow Rock** and **Fiddler Ledge,** both of which are unmarked. It will be better to steer a little eastward of the range rather than take any chance of the vessel getting to the westward of it. An unmarked 25-foot rock ledge is close eastward of the range about midway between Lithgow Rock and Fiddler Ledge. Care should be taken in deep draft vessels not to get too far eastward and foul this ledge.

Just north of Fiddler Ledge the channel takes a sharp turn to the west through **Fiddler Reach.** On the north side of the reach and 300 yards west of the range line is a fog signal. **Doubling Point** at the right angle turn from Fiddler Reach into **Long Reach** is marked by **Doubling Point Light,** 23 feet above the water, shown from a white octagonal tower on a square gray pier connected to the shore by a footbridge; a fog signal is at the light.

There are reported to be strong back eddies on both ends of this turn, and great care should be taken to keep the vessel well under control. Particular caution should be exercised by vessels bound downriver on a strong ebb when rounding Doubling Point from Long Reach into Fiddler Reach.

Winnegance is a village on **Winnegance Creek,** 0.5 mile from the main channel of Kennebec River. The channel is shoal, and navigable only by small craft. Old piling extending across the creek northeast of the highway bridge is partly covered at high water.

Bath (P.O.), a city on the west bank of the Kennebec River 12 miles above the entrance, has waterborne trade consisting mostly of coal and petroleum products. Depths up to 30 feet are at the wharves, the deepest being at the coal wharf. There are rocky ledges on the north and south ends of this berth with 14 and 20 feet, respectively. The maximum draft carried to Bath is reported to be 31 feet. A fish cannery with 12 to 15 feet alongside its wharf is on the west bank about 1 mile north of the bridge.

A combination highway and railway lift bridge crosses the Kennebec River at Bath. The vertical lift span has a clearance of 10 feet; operating regulations are given in **§ 203.8,** Chapter 2.

There are two service float landings just above the bridge on the west bank, one the city landing, and the other a marina having 18 to 20 feet alongside the floats. The city landing has gasoline and water piped to the float. The marina has a ramp for launching small boats from trailers. Gasoline, diesel oil, and fresh water are piped to the floats. Overnight berthing is permitted and electricity can be provided.

Provisions, ice, bottled gas, and some yacht supplies are available. Showers, restrooms, and lodging are available at the Y.M.C.A., a short distance from the landings. Hotels, restaurants, banks, markets, and ship chandlery are available in the town. Telephone and telegraph communications, and bus and taxi services are available. The city has many churches, a hospital, and library.

An important shipbuilding plant at Bath has facilities for making above-water repairs. There are no drydocks or marine railways for large vessels. Boats up to 50 feet in length and up to 6-foot draft can be hauled out for hull and engine repairs. Electric or electronic repairs can be made, and dry covered or open winter storage is available at a boatyard with marine railways on the west bank about 1.3 miles below the bridge. The yard has a float landing with 12 feet alongside. Gasoline and fresh water are piped to the float. Limited yacht and marine supplies and a telephone are available. The yard maintains two guest moorings and permits overnight berthing at the float. Another small boat storage yard is on the west bank above the coal pier, north of the bridge.

The Sasanoa River entering the Kennebec River between **Preble Point,** the northern extremity of Arrowsic Island, and **Sasanoa Point,** the southern extremity of **Towesic Neck,** is described under the Inside Passage. See **caution note** contained in tidal current data for the Kennebec River.

Woolwich (P.O.) is a village on Towesic Neck, opposite Bath. The asphalt pier there is reported to have 22 feet alongside. Only piling remains of the old coal wharf and ferry slips just below this pier.

Chart 288.—About 0.7 mile above the bridge at Bath, the river is divided into two channels by an extensive ledge area; the principal hazards on it being **Winslow Rocks** and **Stetson Rocks,** parts of which dry at high water. Obstruction buoys mark the northern and southern ends of the area, and the eastern side is marked by channel buoys.

The main or eastern channel is deep and favors the

eastern side of the river. The western channel is not marked and is used by small craft. Ledges south of **Days Ferry,** on the east side of the river, are marked by a buoy. The channel past **Thorne Head** is deep and clear.

Two miles above Bath the Kennebec River divides into three channels. The eastern or **Burnt Jacket Channel,** is the most direct, though unmarked and extremely foul and difficult at its northern end, and is used mostly by small craft. Local knowledge is necessary to navigate it safely.

The main channel or **West Branch,** is partly buoyed and is clear and easily followed by aid of the chart. **Thorne Island Ledge,** marked by a buoy near its southeast edge, **Thorne Island** and **Lines Island** are on the northeast side of it and **Wood Island, Crawford Island,** and **Ram Island** are on the southwest side of it. A ledge making out from the northeast side of Wood Island is marked by a buoy. A rock bare at low water is 50 yards off the west side of Lines Island, and a rock awash is off the southwestern end of the island. Near the northern end of the channel, **Grace Rock,** with a depth of 2 feet over it, is marked on its west side by a buoy.

The third channel trends to the southwestward between Wood, Crawford, and Ram Islands, and the mainland. It is unmarked, is foul, and little used.

Chops is the narrow passage between two headlands 0.7 mile above Lines Island. Two steel towers supporting a power line across the channel are prominent. The vertical clearance of the power line is 145 feet.

Chart 314.—Merrymeeting Bay is a shoal bay making westward from Kennebec River 17 miles above the entrance. The bay is the approach to the towns of **Brunswick** (P.O.) and **Topsham** (P.O.) on the **Androscoggin River,** and **Bowdoinham** (P.O.) on the **Cathance River,** 8 and 4 miles, respectively, above Kennebec River. Boats of 6-foot draft can go to Brunswick and 12 feet to Bowdoinham at high water, but there was no traffic in 1958. There are no landings. The channels are narrow and unmarked, and local knowledge is necessary for their navigation. The mean range of **tide** is about 5 feet.

A fixed railroad bridge with a clearance of 17 feet, crosses Androscoggin River just below Brunswick. A highway bridge at Brunswick is the head of navigation, above which are a dam and falls.

Several overhead power cables, about 1.5 miles below the railroad bridge have minimum permit clearances ranging from 44 to 60 feet. The power cable over Cathance River near the mouth has minimum permit clearance of 55 feet. The overhead power cable about 2 miles above Bowdoinham has permit minimum clearance of 40 feet.

It is reported that heavy storms and winter ice change the shoals and depths in Androscoggin River.

Brunswick (P.O.) is the site of Bowdoin College and a manufacturing center of some importance in shoes, textiles, and paper. There is a hospital, and banks, churches, hotels, restaurants, and shopping centers. It has railroad and bus connections, and telephone and telegraph communications.

Chart 288.—A day range is on the eastern shore of Kennebec River to indicate the best water to pass the shoals extending northward from **Abagadasset Point.** The shoals are also marked by a buoy. In 1958 the rear daybeacon was reported to be hard to see because of enveloping trees.

The power cable over Kennebec River at Abagadasset Point has a minimum permit clearance of 145 feet. An 11-foot spot on the west side of the channel opposite Twing Point is marked by a buoy. **Ames Ledge,** on the east side of the river north of **Twing Point** is marked by a daybeacon on the ledge and a buoy off its northwest side.

Swan Island divides the river into two channels. The western channel has been dredged to a depth of 12 feet over a width of 125 feet but it is not marked nor maintained. The main channel is east of Swan Island. This channel is marked by buoys and a daybeacon on Beef Rock. East of the main channel rip rap training walls extend from off **Carney Point** to **Green Point.**

Eastern River enters the Kennebec River between Carney Point and the training wall. The river follows the eastern shore to **South Dresden.** It is unmarked and is crossed by three fixed bridges. The bridge near the mouth has a clearance of 16 feet. Telephone and power cables near the bridge have minimum vertical clearance of 22 feet.

The second bridge, about 2 miles upstream, has a clearance of 23 feet. About 0.6 mile upstream from the second bridge an overhead power cable crosses the river with a permit clearance of 106 feet.

The third bridge, at **Dresden Mills,** about 2 miles above the second bridge, has a clearance of 4 feet. The river is charted for about 3 miles, from its mouth at Carney Point, to a point about 1 mile above the first bridge at South Dresden.

In 1958 the river was reported to be navigable to Dresden Mills with a draft of 4 feet, and above that for several miles through beautiful woodland by small outboard craft. There are several private landings on the river but no facilities. Remains of old wharves can be seen at Dresden Mills and other points.

Richmond (P.O.) is a town on the west bank of the river 23 miles above the entrance. There are several landings in the west channel at the town. The town float landing, at the mill, with a conspicuous stack, has 16 feet alongside. There are no facilities at the landing, but gasoline, diesel oil, water, provisions, and supplies can be obtained in the town a short distance from the landing. In 1958 a sightseeing motorboat ferry made trips three times a week during the summer months from Boothbay through the Inside Passage to the landing at Richmond.

At a point just north of Swan Island, the river is crossed by a State highway drawbridge with a swing span having

a clearance of 15 feet; operating regulations are given in **§ 203.10,** Chapter 2.

Chart 289.—Cedar Grove (Dresden Landing) (P.O.) is a small settlement on the east side of Kennebec River 2 miles above the north end of Swan Island and 0.7 mile above **Courthouse Point.**

South Gardiner (P.O.) is a village on the west side of the river 30 miles above the entrance. The tall brick stack of a former pulp mill stands close to the river. There is a lumber mill but the wharves are in ruins.

Gardiner (P.O.) is a town on the west side of Kennebec River, 33.5 miles above the entrance. Tankers drawing 13.5 feet discharge at the oil wharf on the west side below the bridge, which has 12 feet alongside. The coal dock above the bridge has 15 feet alongside but is seldom used except occasionally by coastal tankers; when proceeding to Hallowell they tie up to it while waiting for high water. The town wharf and float landing just below the bridge has 12 feet alongside but no facilities. A public parking lot is on the wharf.

Randolph, a village on the east side opposite Gardiner has a wharf below the bridge with 12 feet alongside and oil connections but is seldom used. A marina with wharf and float landing has 5 feet alongside. Gasoline, oil, and water are piped to the landing. Ice and provisions are available; a hardware store adjoins the landing. Restrooms are available nearby. Lodging and restaurants are in the vicinity. Three guest moorings are maintained at the marina.

At Gardiner, the river is crossed by a highway bridge having a swing span with a clearance of 20 feet. The eastern opening should be used, as the west one has silted up so as to be unusable. Operating Regulations for the drawspan are given in **§ 203.10,** Chapter 2.

The controlling depth above the bridge at Gardiner to Augusta is about 9 feet.

Farmingdale on the west bank just above Gardiner is the site of a power plant with a tall white stack. The rock-filled cribs, remains of an old intake pier, extend over 100 yards off the power plant. They are unmarked, and no attempt should be made by small craft to pass between them and the shore as the area is extremely foul.

At **Browns Island,** about 1.5 miles above Gardiner, the river is crossed by two sets of power cables that have permit minimum clearances of 140 feet. Log booms extend southwestward and northwestward from the island. They are unmarked; kept in repair they are used to catch drifting pulp logs which are washed over the dams above Augusta by spring floods and freshets. A shoal with a least depth of 3 feet makes out to the north and northwestward of the island.

Hallowell (P.O.) is a town on the west side of the river, 37 miles above the entrance. In 1958, only the oil berth on **Oil Cloth Point,** about 0.5 mile above Hallowell, with a depth of 13 feet alongside, was in use. Oil tankers drawing 15 feet come up the river and berth alongside at high water. The other wharves were in various stages of disrepair or in ruins.

A pinnacle rock with a depth of 5 feet over it is located on the east side of the channel about 450 yards southwestward of the wharf on Oil Cloth Point. It is marked by a buoy on its northwest side.

Augusta (P.O.), the capital of the State of Maine is at the head of navigation of the Kennebec River 39 miles above the mouth. The principal wharves are on the west side of the river between the two lower bridges. There are two float landings; the public landing on the west side just below the second bridge, has 7 feet alongside. The Augusta Yacht Club float landing, on the east side, has a depth of 4 feet alongside.

A private boatyard at the yacht club landing has a marine railway on which members' craft, up to 50 feet in length and 6 feet in draft, can be hauled out for repairs or open winter storage. There is a ramp at the club for launching small boats. There are no service facilities at either landing. There is a **harbormaster.**

Bridges.—All the bridges have fixed spans. The first, a highway bridge, about 125 yards above **Youngs Point,** has a clearance of 70 feet for a center width of 67 feet. The second highway bridge at the upper end of the turning basin has a clearance of 27 feet. Above this bridge the river is very shallow. The third bridge, now used only for conduits, has a clearance of 38 feet. The railroad bridge adjacent to and above the third bridge has a clearance of 23 feet.

The river is obstructed by a dam, 0.5 mile above the second bridge at the head of the turning basin.

Gasoline, diesel oil, oil, provisions, ice, and ship chandlery can be obtained in the city. Telephone, telegraph, bus, and railroad communications are available. A hospital, hotels, restaurants, and other conveniences are in the city.

Chart 315.—Casco Bay is a very extensive area between Cape Small and Cape Elizabeth, a distance of 17.8 miles. Between these two capes the bay extends up into the land an average distance of about 12 miles. The whole number of islands in Casco Bay is one hundred and thirty-six, and very many are fertile and under cultivation, and nearly all are inhabited. Nearly every island lies northeast and southwest, which is the general course of the bay and of all rivers and coves contained within its limits.

Anchorages.—In the eastern part of Casco Bay the best anchorage for strangers is in New Meadows River. Local fishermen and yachtsmen frequently use Sebasco and Cundy Harbors. Potts Harbor, Harpswell Harbor, and Mackerel Cove are good anchorages in the middle of the bay for small vessels and yachts.

Merriconeag Sound and Harpswell Sound, and the whole Casco Bay westward of Harpswell Neck afford good anchorage for large vessels, except in heavy northeast gales.

Vessels can enter through Broad Sound, Luckse Sound, or Hussey Sound, and select an anchorage under the lee of some of the many islands, a suitable depth and good holding ground being found in most places. Port-

land Harbor is a secure anchorage on the western side of the bay, and is the one used mostly by larger vessels.

Most of the dangers are marked and the waters are well charted; so that, with the aid of the chart, no difficulty should be experienced in navigating Casco Bay in clear weather.

Tides and currents.—The mean range of the tide in the bay is about 9 feet. The average velocity of the tidal current at strength is about 1 knot in the entrance to Portland Harbor and in Hussey and Broad Sounds. In the open waters of the bay it is generally 0.5 knots or less. Current predictions for a number of locations may be obtained from the Tidal Current Tables.

Ice.—Considerable ice forms at the heads of the numerous arms extending northward in Casco Bay, but the principal anchorages are available at any season of the year.

The part of Casco Bay between Cape Small on the east, and Halfway Rock Light and Harpswell Neck on the west is full of small islands, ledges, and rocks. Between them narrow but deep channels lead to the bays and sounds at the head. These arms afford good anchorages for small vessels, but are used only by local fishing and pleasure craft. There are several small villages in this part of the bay but no towns.

Temple Ledge, about 1.8 miles southwestward of Cape Small, has a depth of 25 feet and is unmarked. **Lumbo Ledge,** which is about 2.6 miles south of **Ragged Island,** has a least depth of 17 feet, and is marked by a buoy on its south side.

Spoonbowl Ledge, with 5 feet over it, about 0.4 mile southwest of **Gooseberry Island,** is unmarked, and craft bound from Cape Small to Small Point Harbor should be careful to avoid it.

East Brown Cow, 1.6 miles west-northwestward of Bald Head, is bare and about 12 feet high. **Mark Island,** 0.8 mile northward of East Brown Cow, is high and thickly wooded. **Mark Island Ledge,** 0.3 mile southwestward of Mark Island, is bare at low water, and is marked on its west side by a buoy. **Wyman Ledge,** 0.5 mile east of Mark Island, has a least depth of 4 feet, and is marked on its eastern side by a buoy.

White Bull, 1 mile westward of Mark Island, is high, round, and bare. **White Bull Lighted Gong Buoy WB,** about 0.4 mile southeastward of the island, marks the southwestern approach to New Meadows River. **Bold Dick,** a bare unmarked rock, about 0.7 mile west-southwestward of White Bull, is covered by extreme high tides.

Small Point Harbor, on the east side of Casco Bay, 1.5 miles northward of Bald Head and between Wood and Little Wood Islands on the west, and **Morse Neck** on the east, is an anchorage for local fishermen and yachts, but is open to southerly winds.

The principal dangers are: **Gooseberry Island Ledge,** extending about 0.3 mile southwestward of Gooseberry Island, awash at low water and marked by a buoy; **Wood Island South Ledge,** a rocky shoal covered by 5 feet, extending about 0.3 mile south of Wood Island, where it is marked by a buoy and a lighted bell buoy about 350 yards westward of the south end of the ledge; **Middle Ledge,** awash and marked by a buoy on its southwestern side; **Pitchpine Ledges,** with 6 feet over them and marked on its western side by a buoy; and a 3-foot shoal, marked by a buoy, about 0.2 mile southwestward of Carrying Place Head.

There is good anchorage in the harbor and in the tributary harbors of Fish House Cove, West Point Harbor and Cape Small Harbor, but the bottom shoals too rapidly in **Tottman Cove,** north of Flat Point, for good anchorage.

Small Point Harbor can be entered either southward of Wood Island or northward of Little Wood Island. **Wood Island** is rocky and partly wooded and **Little Wood Island** is thickly wooded. **Small Point,** a village on the eastern side of the harbor, has telephone communication and an improved highway to Bath, the nearest city.

Cape Small Harbor affords good anchorage, but its entrance, with 4 feet at low water, is narrow and difficult, and should be entered only with local knowledge, or at high water. A large white hotel northeastward of **Goose Rock** may be used as a mark to clear the rock when entering northward of it.

The passage between Goose Rock and **Mill Point** is sometimes used by local fishing craft but is not recommended for strangers. The best water is reported to be obtained by entering northward of Goose Rock and then favoring the eastern shore until abeam of the northern extremity of Mill Point, then favoring the west side of the two islets eastward of the Mill Point until southward of the landing at the lobster pound.

Anchorage is in midchannel southward of the landing where swinging room can be found in 8 to 10 feet.

There is reported to be depths of 16 to 18 feet at the lobster pound float landing; gasoline is piped to it.

A restaurant, open in the summer months, is at **Head Beach** at the south end of the harbor. A woodland road from the lobster pound leads to it. Restrooms and picnic area are available at the restaurant when open.

There are a number of private float landings and many pile moorings in the harbor, which is secure in all weathers.

West Point Harbor is on the northwest side of Small Point Harbor, between **West Point** and **Carrying Place Head** at the southern entrance to Carrying Place Cove. There are 3 or 4 fishing wharves which dry at low water and a service wharf with float landing that has 3 to 4 feet alongside. Gasoline is piped to the float; ice, provisions, and some supplies are available at the general store on the wharf.

There is good anchorage off the wharf in 15 to 23 feet in muddy bottom but it is exposed to southerly weather. **Fish House Cove** just eastward of West Point is also exposed.

Carrying Place Cove is a thorofare on the north side of Small Point Harbor eastward of Carrying Place Head. It is navigable only at high water. It is reported that 5 feet of water can be carried through Carrying Place Cove

at high water. Two overhead power cables cross the thorofare and have a minimum permit clearance of 30 feet.

West Point is a fishing village on the eastern side of the thorofare. There are fish wharves, and a service wharf and float landing with 6 to 8 feet alongside at the north end of the thorofare. There is good anchorage in 8 to 20 feet off and northwestward of the service wharf.

This is locally known as Carrying Place Cove while the south end of the thorofare, as stated before, is known locally as West Point Harbor. Gasoline, and diesel oil are piped to the float; oil, provisions, ice, and some supplies can be obtained at the village store. The village has highway connections to Bath.

The thorofare leading eastward of **Burnt Coat Island** is marked by buoys. Strangers in small craft should have no trouble navigating it.

Jamison Ledge, 0.5 mile westward of Burnt Coat Island, is 0.4 mile long, bare at low water, and marked at its south end by a daybeacon. **Flag Island Ledge,** between it and Flag Island, is bare at low water and unmarked.

Flag Island is high and thickly wooded. **Long Ledge,** 0.4 mile northwestward of Flag Island, is grassy. **Goudy Ledge,** 0.6 mile northward of Flag Island, is bare at half tide and marked by a daybeacon. **Rogue Island,** on the west side at the entrance to New Meadows River, is low, with scattered trees. The bottom in this vicinity is very broken.

Sebasco Harbor is a good anchorage for small vessels eastward and southward of Harbor Island, and 3.5 miles northward of Bald Head. **Dry Ledges (North Blacksnake)** form a large, bare ledge in the entrance; the northern end should be given a berth of over 100 yards, and the broken ground extending 300 yards eastward from the ledge should be avoided.

The entrance, marked by a lighted buoy, is between Dry Ledges and the buoy about 200 yards southward of Harbor Island. Rocky ledges extending about 150 yards from both shores restrict the entrance to Sebasco Harbor. On the western side numerous bare rocks extend shoreward along the ledge in a northwesterly direction.

Anchorage can be selected in 30 to 36 feet, 250 to 300 yards off the cove on the eastern side, and also in midchannel off the landing inside Harbor Island in 24 feet.

The thorofare leading northward from Sebasco Harbor, inside Harbor Island, is bare at low water.

There is a boatyard with marine railway in the cove at the north end of the thorofare which hauls out small craft for repairs, open or covered winter storage. The cove is mostly dry at low water.

Sebasco Estates (P.O.) is a summer resort on the east side of Sebasco Harbor. A pier with a float landing has a depth of 8 feet. No supplies are available.

The thorofare leading northward of **Harbor Island** and eastward of **Malaga Island** is marked by two buoys near the southern end, and is easily navigated by small craft. It is used considerably as an anchorage by small fishing craft.

Sebasco is a village of fishermen on the east side. There is a wharf with float landing with 3 to 4 feet alongside. Gasoline, diesel oil, and water are piped to the float; ice, provisions, bottled gas, and ship chandlery are available at the wharf.

A ledge covered at high water extends 350 yards north-northeastward from Bear Island and is marked at its end by a buoy. The buoy also marks the northern entrance to the thorofare and the anchorage northward of Malaga Island.

New Meadows River, at the northeastern end of Casco Bay, is about 8.5 miles long from **Bear Island** at the entrance to a highway bridge and dam at the head of navigation. A lighted buoy off **Fort Point** marks the entrance to the river. It has a deep water channel for the first 6 miles, and a draft of about 12 feet can be carried to within 0.5 mile of the head. The principal dangers are buoyed.

Above that point the channel is crooked and unmarked, and has a depth of about 7 or 8 feet to the head. Local knowledge is necessary to carry the best water above **Foster Point,** 3 miles from the head.

The river is seldom used except by local fishing boats and small pleasure craft. Small craft can enter New Meadows River from westward 6 miles above its entrance through Gurnet Strait.

Cundy Harbor is a good anchorage for small vessels on the west side of New Meadows River, 1 mile above its mouth. The harbor is clear and has depths of 22 to 31 feet. A buoy marks the south end of the bare ledges on the northeast side of the harbor.

Cundys Harbor (P.O.), is a village on the western side. There is an inactive (1958) fish processing plant and wharf, and two service wharves with float landings all with 8 feet alongside. Gasoline and water are piped to the two service wharves and diesel oil can be obtained by tank truck.

Overnight berthing is permitted at the landings and guest moorings are maintained; ice, provisions, and some yacht supplies can be obtained. Restrooms are available at the general stores at both landings. Picnic areas, parking, and a ramp for launching small boats are available. Telephone and telegraph communication is available.

A boatyard and marine railway in the cove at the south end of the harbor can haul out craft up to 65 feet in length and 6-foot draft for hull and engine repairs, or open winter storage. Electric and electronic repairs can be made. A reef baring at half tide is about 75 yards south of the fish plant wharf.

Dingley Island is on the west side of the river about 1 mile above Cundy Harbor.

The Basin, a cove on the east shore of New Meadows River about 1.3 miles above Cundy Harbor, has a narrow but clear entrance. It is a popular weekend anchorage for yachts and small craft. There are no landings. A service wharf and float landing with 16 feet alongside is about 0.5 mile northeastward of the entrance to the basin and eastward of Hen Island Ledge Daybeacon.

Winnegance Bay, on the east side of New Meadows River, 3 miles above the entrance, is a large bight with

secure anchorage in 18 to 24 feet. There are a few private landings. The southeast side of the bay is foul. **Bushy** and **Hen Islets** are near the edge of the foul ground; and **Hen Island Ledge,** bare at its end at low water, extends 500 yards west-southwestward from the south islet, where it is marked by a daybeacon. The north side of the bay is clear. There is considerable yachting activity in this bay, and good anchorage is available in **Brighams Cove** at the head of the bay.

A directional light on **Birch Point,** on the northwestern side of the entrance to the bay, shows an intensified beam on the bearing **009°** and marks the reach in the river from Sheep Island Ledge to the entrances to Winnegance Bay and the upper river. It is the only lighted aid in the river northward of Bear Island.

There is good anchorage in the long coves on either side of **Rich Hill.** The New Meadows Yacht Club has float landings with 22 feet alongside at its southern extremity of Rich Hill. Gasoline and water are piped to the floats and ice is available. The large clubhouse has a telephone, restrooms, and showers. Provisions can be obtained at a market 2 miles away, and diesel oil by truck from Brunswick or Bath. Guest moorings are maintained by the club.

New Meadows and **Harding** are small villages near the fixed highway bridge and dam crossing New Meadows River at the head of navigation. The remains of the piers of an old highway bridge, 0.3 mile below the highway bridge, are covered at high water. Extreme caution should be exercised in passing between them.

A float landing with 12 feet alongside is at an inn at the east end of the highway bridge. Restaurants, lodging, and restrooms are available at the inn. Gasoline can be obtained from a nearby filling station. Good anchorage is in midstream off the float.

Ridley Cove is eastward of **Yarmouth Island** and just westward of the entrance to New Meadows River. The cove has good anchorage in 30 to 42 feet, but is exposed to southerly and southwesterly winds. It should be avoided by strangers because of the numerous unmarked ledges and rocks off the entrance.

From its northern end a narrow, deep channel leads close westward of **George Island** into Hen Cove. Another narrow channel, obstructed and suitable only for small craft in the absence of local knowledge, and in which a depth of 3 feet has been reported, leads in to Quahog Bay. **Hen Cove** has extensive shoals but is a good anchorage for small craft.

Little Yarmouth Island, close westward of Yarmouth Island, has a service wharf with float landing on its north end. Gasoline is piped to the float.

Dangers off the entrance to Ridley Cove include: **Jenny Island,** 10 feet high and grassy; **North Jenny Ledge,** bare at lowest tides and marked by a buoy at the south end; **Jenny Ledge,** bare 5 feet at low water; **Ballaststone Ledge,** 5 feet high and grassy; and numerous bare spots on **Yarmouth Ledges. Flash Island** and **Duck Rock** are small islets on the extensive ledge area southward of Yarmouth Island.

Quahog Bay is a narrow arm extending about 4 miles in a northeasterly direction. It offers good anchorage for small vessels. Numerous unmarked ledges and many small islands are off its entrance, which is between Yarmouth Island and Ledges on the east and **Long Point Island** on the west.

The buoyed channel from New Meadows River to Orrs and Bailey Islands leads across the entrance.

There is also a good channel between Saddleback Ledge, Ragged Island, Blacksnake Ledge, Yellow Rock, and Twobush Island on the east, and Round Rock, **Middle Ground Rock,** and Cedar Ledges on the west.

Saddleback Ledge has rocks awash, **Ragged Island,** high and scantily wooded on top, has a house on it, **Blacksnake Ledge** bares at low water, **Yellow Rock** and **Two Bush Island** are grassy, **Round Rock** is covered at high water, and **Cedar Ledges** are bare.

Several unmarked ledges and sunken rocks are in Quahog Bay. **South Ledges,** covered at high water, and **North Ledge,** covered at half tide, extend 0.4 mile southwestward and northeastward, respectively, from **Pole Island.**

Card Cove, on the west side of the bay and west of Pole Island, is used by small fishing boats, but the entrance is only 50 yards wide between ledges off **Pinkham Point** and the point on the south side.

There is a wharf at the general store on the west side of the cove with 2 feet at its float landing. Gasoline, provisions, and some supplies can be obtained at the store. Good anchorage in 29 feet is off the wharf.

On the east side of Pinkham Point in the channel between it and Pole Island there is a lobster wharf and float landing with 22 feet alongside. Gasoline is piped to the float, and oil, ice, provisions, and some supplies are available. There is excellent anchorage off the wharf.

In **Dyer Cove,** about 1.7 miles above Pinkham Point, there is another lobster wharf. Gasoline, and some provisions and supplies can be had at a store near the wharf. The upper end of Quahog Bay off Dyer Cove affords one of the best anchorages on the coast for cruising craft, and the swimming in the warm water of **Mill Cove** northward of **Snow Island** is reported to be excellent.

Gun Point Cove is a narrow arm of no importance making northward on the east side of Orrs Island. There are no wharves. The point on the east side is wooded and has a house on the end. **Hen** and **Oak Islands** are islets on the ledge area southward of Gun Point and Long Point Island. A channel across this ledge area is marked by a buoy. This channel is part of an inside passage for small craft to New Meadows River from the westward. Oak Island has a stone cairn monument on it which is conspicuous.

A passage with a depth of 4 feet extends from the north end of Gun Point Cove into Harpswell Sound. This passage is crossed by a fixed bridge having a clearance of 14 feet. The passage is difficult because of strong currents and unmarked ledges, and should not be attempted by strangers. There are several lobster wharves with float landings in the vicinity of the bridge.

Lowell Cove, in the south end of Orrs Island, is used as

an anchorage by local fishermen. There are a number of fish and lobster wharves in the cove, most of which dry at low water. Gasoline is piped to two of them, one near the head and the other on the east side near the entrance. At the latter lobster wharf there is reported to be a depth of 25 feet at its float. Ice can be obtained at it and provisions and some supplies can be had at a general store in the village of **Orrs Island** (P.O.) at the head of the cove. The supply of fresh water is very limited. There is telephone and telegraph communication, and a good road to the mainland.

Water Cove, in the north end of **Bailey Island,** is foul near the shores and is little used.

Ram and **Pond Islands,** southeastward of Lowell Cove, are round and grassy. **Pond Island Ledges,** extending 0.6 mile southwestward of Pond Island, have many spots bare at low water, and are unmarked.

Halfway Rock, about in the middle of the southern part of Casco Bay, is a low, rocky islet marked by a light. Ledges extend 0.2 mile southwestward and northward from it. **Webster Rock** at the end of the ledge extending northward is marked by a buoy.

Halfway Rock Light (43°39.4′ N., 70°02.2′ W.), 76 feet above the water and visible 14 miles, is shown from a white granite tower 77 feet high, attached to a dwelling; the fog signal and radiobeacon at the light are synchronized for distance finding.

Drunkers Ledges, 2 miles north-northeastward of Halfway Rock, consist of two ledges 0.3 mile apart. The southeast one has 4 feet over it and is marked on its southwest end by a buoy. The northwest one is bare at half tide and is marked near its western end by a daybeacon.

Between Drunkers Ledges and Jaquish Island is **Mark Island Ledge** with 4 feet over it and marked at its north end by a bouy. An area of broken ground with depths of from 4 to 22 feet extends south-southwestward from Jaquish Island to point about 0.4 mile east of Drunkers Ledges. A buoy marks the southwestern end of it. In heavy weather the sea breaks on the shoalest places on it.

Little Mark Island, on the west side of Merriconeag Sound at the entrance, is grassy and marked. **Little Mark Island Monument Light,** 74 feet above the water and visible 7 miles, is shown from a black and white stone pyramidal monument. **Great Mark Island** is bare and grassy.

Whale Rock, which dries 5 feet, is 0.4 mile southwestward of Little Mark Island.

Merriconeag and **Harpswell Sounds** are of little commercial importance, but they form the approach to a good and convenient anchorage. Vessels of the deepest draft can enter and find anchorage in 21 to 60 feet, good holding ground.

The entrance is 3.5 miles north-northeastward of Halfway Rock Light, and is marked on its western side by the light on Little Mark Island. The two sounds extend in a northeasterly direction 10 miles, and for the first 4 miles the prominent dangers are marked. Above this, strangers should not go without a pilot, as the channel is narrow, and flats make out some distance from the shore in several places.

Special small-vessel **anchorage** areas have been established in Harpswell Sound, at Harpswell Harbor, Beals Cove, and the yacht club anchorage off the southwestern end of Orrs Island; limits and regulations are given in **§ 202.1** and **§ 202.5,** Chapter 2.

Jaquish Island, on the east side of the entrance to Merriconeag Sound, and **Turnip Island,** westward of it and marked by a pillar of stones, are low and grassy. There is reported to be a controlling depth of 7 feet in **Jaquish Gut.** A fairway bell buoy is about 0.6 mile southeastward of the island.

Charity Ledge, eastward of Jaquish Island, has a charted depth of 11 feet and is marked by a buoy.

Mackerel Cove, in the southwestern shore of Bailey Island, is a good anchorage in 30 to 48 feet for small craft which use it frequently; it is open southwestward, but a heavy sea never enters. Bailey Island is the eastern point at the entrance to Merriconeag Sound.

Bailey Island (P.O.) is a village on the cove. An excursion steamer maintains daily service between Portland and the cove during the summer season. With the exception of the ledge extending southward from **Abner Point,** on the west side of the entrance, and which is marked by a lighted buoy, there are no dangers in the channel.

The water shoals gradually toward the head. A ledge extending about 150 yards southwestward from the steamer wharf shows a little after high water.

The steamer wharf on the east side of the cove has 18 to 20 feet alongside, and gasoline is piped to a float landing on its north side. There is a general store at the wharf where ice, provisions, some supplies, and ship chandlery can be obtained.

A float landing on the west side of the cove near the head has a depth of 6 feet alongside and gasoline is piped to it. Lodging and restaurants are available in the village. There is telephone and telegraph communication, and a good road to the interior. Ice seldom obstructs the cove.

The southern point of Bailey Island is marked by two high observation towers and a house.

There is a boatyard and marine railway on the north side of the cove on the west side of the island. Craft up to 50 feet in length, 8-foot draft to a limit of 20 tons, can be hauled out for hull and engine repairs, and dry, covered or open winter storage. Electric and electronic repairs can be made, and some marine hardware and supplies can be obtained at the yard.

On the north end of the island on the end of the spit, west of the stone crib bridge over Wills Gut, there is a lobster pound, and wharf and float landing to which gasoline is piped. A restaurant, and restrooms are on the wharf, and parking and picnic areas adjoin it. A hard beach where small boats can be launched is at the head of the cove.

Wills Gut is a thorofare between the south end of Orrs Island and the north end of Bailey Island. It is used by

local fishing boats, but the channel is very narrow and difficult. Strangers using the channel should await low tide, when the flats bare enough on each side to indicate the channel course. A fixed stone crib highway bridge over the gut has a clearance of 10 feet. The controlling depth through the gut is reported to be 5 feet.

A summer resort is on the southwest end of Orrs Island. The old steamer wharf there, is in ruins. The Orrs-Bailey Yacht Club has a float with 15 feet alongside close northward of the old steamer wharf. Gasoline is piped to the float, and restrooms are available at the club. The anchorage off the club has been prescribed as a special small-vessel **anchorage**; limits and regulations are given in **§ 202.1** and **§ 202.5**, Chapter 2.

There are several wharves southward of the club landing toward the Wills Gut bridge, on one of which is a general store where ice, provisions, hardware and some yacht supplies may be obtained. There are a ramp, parking, and picnic areas at the store.

The approach to the wharves from Merriconeag and Harpswell Sounds is northward of a buoy and a daybeacon marking the end of **Cox Ledge** which bares at low water, and extends from the northwestern point of Bailey Island.

Pinkham (Ram) Island, on the west side of Merriconeag Sound northward of the thorofare leading into Potts Harbor, has one house and is bare and grassy. Ledges, bare and submerged, extend 500 yards southward of the island to a buoy. A channel northwestward of the island has a depth of at least 8 feet. It leads between shoals on each side and should not be used by strangers.

Harpswell Harbor, on the west side of Harpswell Sound 3.5 miles above Little Mark Island, is a good anchorage in from 18 to 36 feet, shoaling gradually to the head. There are private float landings for small craft on the west side, and a small settlement is on the main road back of the landing. The waters of Harpswell Harbor have been prescribed as a special small-vessel anchorage.

Beals Cove, a shoal foul cove on the west side of Orrs Island, has also been prescribed as a special small-vessel anchorage.

Reed Cove, on the west side of Orrs Island, has a boatyard on the north side. Small boats are hauled out for repairs or storage.

There is a thorofare from the north end of Harpswell Sound through **Ewin Narrows, Prince Gurnet,** and **Gurnet Strait (Simon Gurnet)** to New Meadows River. It is occasionally used by local boats. The channel is narrow and has many dangers; the tidal currents are strong; and the thorofare should not be used by strangers. It is marked by bush stakes.

Gurnet Strait is crossed by a fixed bridge with a clearance of 7 feet. The depth at the bridge opening is about 6 feet. The southerly channel through the bridge is reported to be the clearest and deepest, the northerly one being shoal. This is reported the shoalest place on the route.

The **tidal current** through Gurnet Strait is very strong at strength—estimated at 7 to 8 knots—and boats go through only at slack water. The ebb current runs eastward. Low-water slack occurs a little before low water at Portland.

At the strength of the current, there is a difference of elevation of probably 3 feet in the level of the water on either side of the bridge. The flood currents meet in the reach between Prince Gurnet and Gurnet Strait.

Gurnet is a village on the shores of Gurnet Strait. There are several wharves with float landings. Restaurants, lodging, and restrooms are available on the wharves or nearby. Provisions can be obtained. Gasoline was not available at the landings in 1959.

The part of Casco Bay westward of **Harpswell Neck** has numerous sounds, bays, and rivers, separated by islands lying in a northeasterly and southwesterly direction. Portland Harbor, at the western end of the bay, is the principal port of Maine. Many summer resorts and landings are on the islands and shores of the bay, and small vessels from Portland run as far east as Orrs Island and call at the landings between them.

There are broad channels into the bay through Broad, Luckse, and Hussey Sounds, and secure anchorage for vessels of any draft can be found. The bay is frequented by many yachts and small pleasure craft, and some fishing boats. The steamers running to the landings are of 7 to 11 feet in draft, and most of the wharves on the islands are built for vessels of about this draft.

Through **Hussey Sound,** 42 feet can be taken on either side of Soldier Ledge which has been cleared to a depth of 40 feet. The inland channel extends from Peak Island along the north shore of Long Island.

From the bell buoy in the entrance to **Broad Sound,** 42 feet can be carried to good anchorages in upper Broad Sound to Middle Bay, and to the area of French Island and the north end of Great Chebeague Island.

Also, 42 feet can be taken through **Luckse Sound** to the vicinity of **Bangs Island.** There is a minimum effective dragged depth of 27 feet through the channel eastward of Bangs Island to off the north point of Great Chebeague Island.

An inland channel used by inter-island ferry steamers, yachts, and fishing craft extends from the south point of Great Chebeague Island around either side of Bangs Island, across Broad Sound and through Potts Harbor to Merriconeag Sound.

Provided care is taken to keep off the ledges and other charted dangers, excellent anchorage is available in the area inside of Hussey Sound, in the upper part of Broad Sound, in the southern part of Middle Bay, and in the areas east of French Island and north of Great Chebeague Island.

Potts Harbor is a large irregular bight in the southern end of Harpswell Neck and has **Haskell and Upper Flag Islands** and the ledges between them on its southern side. The harbor affords good anchorage in depths of 24 to 33 feet.

South Harpswell (P.O.) is a village on the east side of

Potts Harbor. The old steamer wharf is in ruins. A town wharf with float landing has a depth of 4 feet. Limited supplies are available at the general store. A fish wharf, dry at low water, on the west side of **Ash Point**, has gasoline piped to it.

There are two entrances to the harbor. The eastern one, from **Merriconeag** Sound, is marked by buoys and a daybeacon, but is narrow and crooked with strong tidal currents. It is suitable only for small craft or small vessels with local knowledge.

The western entrance, between Upper Flag Island and Horse Island, is straight and about 225 yards wide at its narrowest part, between Horse Island and the edge of the shoal between Upper Flag Island and **Thrumcap**, a grass-covered rock. Upper Flag, **Little Birch**, and **Horse Islands** are grass covered.

A ledge extending southwestward from Little Birch Island is marked by a bell buoy, and a shoal with a least depth of 3 feet, about 0.2 mile west of Upper Flag Island is marked on its southwestern end by a buoy.

Basin Cove has been prescribed as a special small-vessel **anchorage**; limits and regulations are given in **§ 202.1** and **§ 202.5**, Chapter 2. The entrance to the cove is obstructed by the remains of an old dam which is covered at high water. Local knowledge is necessary to enter the cove.

Outer Green Island, 4 miles westward of Halfway Rock Light, is grassy. **Junk of Pork**, a high rock with surrounding bare ledges, is 250 yards southward of it. **Johnson Rock**, 0.2 mile northeastward of Outer Green Island, with foul ground between, has 8 feet over it, and is marked on its north side by a buoy.

Green Island Reef is about 0.2 mile long and bare at low water; it is 0.4 mile southwestward of Inner Green Island, with foul ground between. It is marked on its southwest side by a buoy. **Green Island Passage**, leading between the buoys marking Green Island Reef and Johnson Rock, has a width of 400 yards, and is used by small vessels. **Inner Green Island** is low and grassy.

Jewell Island and **Cliff (Crotch) Island** are partly wooded. Numerous houses and landings are on the northwest side of Cliff Island. The steamer landing on the east side of Cliff Island has about 22 feet alongside. A float landing, post office, and general store which handles gasoline are here. At a fish wharf on the east side of the island there is a float landing with 6 feet of water.

A ledge with 3 feet over it in places extends 0.4 mile southwestward from the southern end of Cliff Island. **Johns Ledge**, at its end, covered by 16 feet, is marked by a buoy. There is no safe passage for vessels between the buoy and the island. A buoy marks the broken ground and shoals southeastward of the island.

Jewell Island has a cove with good anchorage for small craft on the northeast end. A landing for small craft is at the head of the cove. A prominent stone tower is on the south end of Jewell Island, and two old wharves and a house are on the west side.

Broken Cove is formed by a group of bare rocks and small islets connected by ledges, extending 0.6 mile northeastward from **West Brown Cow**, a grass-covered islet. The daybeacon on Stockman Island in range with or open eastward of the northeast point of Ministerial Island leads eastward of the ledges, which are marked on the northeast side by a buoy.

Eagle Island is high, wooded, and prominent, and has a house and flagstaff on the northeast side. A ledge, bare at one-quarter ebb, extends 300 yards westward of the island; a buoy is on the southwest side of the ledge.

Eagle Island Ledge, awash at high water, is 300 yards southeastward of the southern end of Eagle Island. Ledges with 8 to 10 feet over them extend 300 yards southeastward and 500 yards eastward from the rock that shows bare. Partly bare ledges extend 350 yards northeastward from Eagle Island.

Bates and **Ministerial Islands** are grassy. They are surrounded by extensive ledges. **Stave Island** is sparsely wooded. **Stave Island Ledge** is bare at low water. It is marked by a buoy at its northeast end.

Hope Island, in Luckse Sound, is wooded except on the southwest end, which is marked by a large house and flagpole. **Rogues** and **Sand Islands**, northeastward of Hope Island, are low and grassy. The channel between them is marked by buoys. **Crow Island** has one house in the center and is low and grassy.

Bangs and **Stockman Islands** are bare and grassy. Stockman Island has a daybeacon at the southwest end. **Goose Nest** is a grassy islet about 4 feet high, and **Goose Nest Ledge** is bare at a little below high water. A ledge extending 400 yards south of Goose Nest is marked by a buoy.

Whaleboat Island is wooded on the north end and on the highest part, and grassy elsewhere. A light shown from a white skeleton tower is near the southerly point. A 23-foot shoal, about 0.2 mile south of the light is marked by a gong buoy, which also marks the junction of two deep channels leading to an oil terminal and wharf on the west side of Harpswell Neck, about 2.6 miles northeastward of Basin Point.

The eastern channel leads between **Birch Island Ledge**, which bares 6 feet and is marked on its southwestern end by a buoy; and a buoyed 27-foot spot on the east, and Whaleboat Island on the west. The western channel leads between Whaleboat and Little Whaleboat Islands. It is buoyed.

Little Whaleboat Island is wooded. Extensive ledges extend about 0.7 mile northward, westward, and southwestward of the island. **Little Whaleboat Ledge** with a least depth of 3 feet and **Whaleboat Ledge** with 6 feet over it are about 0.8 and 1 mile, respectively, southwestward of Little Whaleboat Island. Both are marked by buoys.

Middle Bay makes northeastward on the west side of Harpswell Neck. **Harpswell Center** is a village on the main road of Harpswell Neck. The bay has good anchorage, but is seldom used. **Lower Goose** and **Upper Goose Islands**, on the west side, are wooded.

Merepoint Bay, shallow and obstructed by flats at its northern end, is between **Birch** and **White Islands** on the east, and **Merepoint Neck** on the west. It is the center

of considerable yachting activity in the summer season. The Merepoint Yacht Club on the neck is an organization of summer residents without formal clubhouse or landing. Several private float landings of members are used. **Merepoint** (P.O.) is a village on the neck.

A lobster pound and wharf with float landing with 2 feet alongside is on the east side of the neck, about 1 mile northeast of **Mere Point.** Gasoline is piped to the wharf. A boatyard and marine railway, on the west side of the neck, about 2 miles above Mere Point, can haul out craft up to 35 feet in length and 5-foot draft for hull and engine repairs, and dry, covered or open winter storage. A ramp for launching small boats is at the yard.

Maquoit Bay makes northeastward on the westward side of Merepoint Neck; the entrance is north of the Goose Islands, and is obstructed by flats covered by 1 to 4 feet. Through the flats a channel with 19 to 24 feet leads for a distance of 2 miles from its entrance.

The chain of islands between **Sister** and **Bustins Islands** are wooded, and there are flats between and northward of them. **Sister Island Ledge,** northward of Sister Island, is partly bare at high water. Bustins Island has numerous cottages. A public landing is on the southeast side of the island, with a post office and store nearby. Gasoline is available.

Rocks covered at high water are 50 yards southeastward and 75 yards southwestward from the landing. Eastward of the landing is a house on a ledge about 100 yards offshore. **Little Bustins Island** is marked by a house and a clump of trees in the center.

Bustins Ledge, southward of Bustins Island, is bare about 4 feet at high water. **French Island** is wooded and **Little French Island,** also wooded, is on its north side.

During the summer months, a vessel from Portland stops at Cousins, Littlejohn, and Bustins Islands, carrying mail, passengers, and freight.

Harraseeket (Freeport) River is west of Maquoit Bay. The approach is between Bustins Island on the east and **Moshier Island,** wooded, on the west. The entrance of the river is between **Moore Point** on the east and **Stockbridge Point** on the west, and is narrow. Except for a dangerous midchannel rock, with 2 feet over it reported to lie in the entrance about 100 yards southwest of Pound of Tea Island, it has a least depth of 23 feet.

From the entrance the channel leads between flats, mostly dry at low water, in a northerly direction to **Weston Point.** Thence a shoal unmarked channel leads to **Porter Landing,** to which small craft of drafts of 6 feet or less are reported to go at high water.

A special small-vessel **anchorage** area has been established between Stockbridge Point and Weston Point; limits and regulations are given in **§ 202.1** and **§ 202.5,** Chapter 2.

South Freeport (P.O.), on the west side 0.7 mile above the entrance, has a town wharf with a depth of 15 feet at the float landing at the end. A yacht yard and marina are at the wharf. Float landings of the marina have 18 feet alongside, and gasoline, diesel oil and water are piped to the floats. Ice, provisions, yacht supplies, and ship chandlery are available at the marina.

The yacht yard has a marine railway and can haul out craft up to 50 feet in length and 6 feet in draft for hull and engine repairs, and dry covered or open winter storage. Electric and electronic repairs can be made. Restrooms and showers are available at the marina; telephone communication and boat rental are available.

The Harraseeket Yacht Club with 15 feet alongside its float landing, is about 100 yards southwestward of the wharf and marina. A motorboat passenger ferry operates to Bustins Island during the summer season.

Prominent landmarks include a large stone turreted tower at South Freeport, a tank and standpipe at Yarmouth, the twin stacks and large green-colored power plant and oil tanks on the southwestern end of Cousins Island which are visible from every section of the bay.

Littlejohn and **Cousins Islands,** northward of Great Chebeague Island, are connected by a wooden bridge, which in 1958 was not in good repair. An overhead telephone cable crosses between the islands just north of the bridge. There is a wharf on the southeast side of Littlejohn Island, which in 1958 had a reported depth of 15 feet alongside. Gasoline is piped to the wharf, and provisions and some supplies can be obtained during the summer months.

There is a large power plant on **Birch Point,** the southwestern end of Cousins Island; the twin stacks and green painted plant and oil tanks are conspicuous throughout the bay. The plant has a wharf with 35 feet alongside at which ocean tankers dock every month.

There is a wharf and float landing on **Doyle Point** on the east side of the island. No facilities are available. A small freight and passenger vessel from Portland calls regularly at the two landings during the summer months.

Cousins Island is connected to the mainland by a fixed bridge. The span over the main navigation channel through the bridge has a clearance of 25 feet.

Overhead power cables with a permit clearance of 68 feet over the main channel cross the waterway just northeastward of the bridge. Each of the islands has a post office and a store. **Cousins Island Light (43°44.8′ N., 70°09.2′ W.),** 24 feet above the water and visible 5 miles, is shown from a white skeleton tower on **Spruce Point,** the southern extremity of the island.

Royal River is a narrow, crooked stream westward of Harraseeket River. Its approach is westward of Cousins Island, in the northwestern part of Casco Bay. The river leads to the town of **Yarmouth** (P.O.). The river has a controlling depth of 6 feet to the head of navigation at the highway bridge, about 0.7 mile below the town. Falls in the river are just above the highway bridge. A new fixed highway bridge with a clearance of 21 feet crosses the river about 100 yards southeast of the old highway bridge. In 1959 it was reported that a sand bar was building up across the entrance to the river between **Parker Point** and **Fogg Point.**

The very crooked channel leads between flats bare at low water, and is usually marked by bush stakes. The best time for strangers to enter is on a rising tide. At Yarmouth is a boatyard and marine railway that can haul out craft up to 60 feet in length for hull and engine

repairs, and dry, covered and open storage. The yard has a float landing with 9 feet alongside; gasoline, water, electricity, diesel oil, ice, provisions and yacht supplies are available. There is a ramp for launching small boats.

Picnic and parking areas are available and the yard maintains eight guest moorings. Telephone, taxi, and bus communications are available. A fish cannery is on the south side of the river, 600 yards below the highway bridge at Yarmouth. The cannery wharf has a depth of 2 feet at the outer end. **Cousins River,** a narrow shallow stream, empties into the mouth of Royal River from northward. Two fixed highway bridges cross the river about a mile above its mouth.

Great Chebeague Island is one of the largest island in Casco Bay. **Indian Point,** on the west side, is a sandspit. There is passenger and freight service from Portland to the wharf in Chandler Cove on the west side of the south end of the island. The wharf has a depth of about 16 feet alongside. Gasoline is available at the wharf in summer. **Chebeague Island** (P.O.), the village, is located in the north central part of the island.

Chandler Cove is formed by a bight in the southwestern end of Great Chebeague Island and by Little Chebeague Island; it is a good anchorage with 30 to 60 feet, but is little used.

Little Chebeague Island has a patch of woods in its center and a few houses. The old landing is on the east side.

Long Island, southwestward of Great Chebeague Island, has several landings on its northwest side. **Mariner** and **Long Island** (P.O.) are villages near the northern and western ends, respectively. Passenger steamers from Portland call at Ponce Landing on the northwest side.

Just northeastward of Ponce Landing are Government piers extending out 350 yards to deep water. A light is on the outer end of the easternmost government pier. The passage between **Crow Island** and the north point of Long Island is closed by scuttled vessels, with hulls showing above high water.

The islands southward of Long Island are described with Portland Harbor.

Broad Cove, in the northwestern part of Casco Bay, is shallow. Good anchorage is available in the middle of the cove, southwest of **Prince Point,** in 15 to 17 feet. It is open southward and eastward.

Falmouth Foreside, a yachting center 3 miles north of Presumpscot River, has a boatyard, marine railway, and marina where craft up to 70 feet in length and 8 feet in draft can be hauled out for hull and engine repairs, and covered, open dry winter storage. Electric and electronic repairs can be made. The yard has float landings with 6 to 10 feet alongside. Gasoline, diesel oil, and water are piped to the floats, and electricity is available for overnight berthing.

There are numerous private moorings and the yard maintains guest moorings. Ice, provisions, yacht supplies, and ship chandlery are available, and there is a restaurant bar at the yard. Telephone, bus, and taxi service are available.

The Portland Yacht Club, close northeastward of the yard has a float landing with 15 feet alongside; water is piped to the float. The club has a restaurant and club facilities available for members and guests. There is communication with Cousins, Littlejohn, and Great Chebeague Islands during the summer months from a town landing with 4 feet alongside.

The waters off Falmouth Foreside shore from Prince Point northeastward have been prescribed as a special small-vessel **anchorage**; limits and regulations are given in **§ 202.1** and **§ 202.5,** Chapter 2. The **harbormaster** supervises the moorings.

In approaching the landings, from the southward, care should be taken to give the buoy marking **York Ledge** a berth of at least 100 yards to eastward and northward before rounding up to the northwestward. A number of small craft cutting too close to the buoy have hung up on the ledge.

Sturdivant Island, covered with grass and bushes, is partly wooded, and has a house on it. Sturdivant Island Ledges, extending around the island are bare in places, and are marked on the southern, eastern, and western edges by buoys. **Underwood Ledge,** to the westward, with 3 feet over it, is marked on its southeastern side by a buoy. **Basket Island** is wooded.

Upper Basket Ledge bares at low water; **Lower Basket Ledge** bares at half tide, and both are marked by daybeacons. A 10-foot spot, about 700 yards westward of the daybeacon on Lower Basket Ledge, is marked by a buoy on its southwestern side. **Clapboard Island** is wooded and has a private landing on its west side. The island is surrounded by ledges, bare and submerged.

Cow Island Ledge Light (43°42.2′ N., 70°11.3′ W.), 30 feet above the water and visible 11 miles, is shown from a skeleton tower, painted in black and red horizontal bands on a red cylindrical foundation; the light marks the ledge between Clapboard Island and Great Diamond Island.

Waites Landing is 1.5 miles southward of Falmouth Foreside. **The Brothers Islands** are two low, flat islets.

Mackworth Island is connected to **Mackworth Point,** the eastern entrance point of Presumpscot River, by a stone causeway and fixed highway bridge on piles with a clearance at the navigation channel through the bridge of 5 feet.

Presumpscot River, the entrance of which is between Mackworth Island and **Martin Point,** has a narrow crooked channel with a depth of 13 feet to the highway bascule bridge between Martin and Mackworth Points. The bridge has a clearance of 13 feet for 50 feet at the center; operating regulations are given in **§ 203.15,** Chapter 2. For a mile above the bridge the channel has a depth of 6 feet.

About 1.5 miles above the bascule bridge, two fixed bridges, one railway, and one highway, cross the river. They have clearances of 7 feet. In 1959, two new twin fixed highway bridges were under construction close eastward of the railway bridge. There is no waterborne

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commerce on the river and the channel is unmarked. On Martin Point the buildings and stack of the former Marine hospital are conspicuous.

Portland Lightship (43°31.6′ N., 70°05.5′ W.), is moored about 5.3 miles east-southeastward of Cape Elizabeth Light. The vessel has a red hull with the name PORTLAND in large white letters on the sides. A light, 65 feet above the water, is shown from the foremast. The radiobeacon and the fog signal are sychronized for distance finding.

Cape Elizabeth, the southern entrance point of Casco Bay, is marked by **Cape Elizabeth Light (43°34.0′ N., 70°12.0′ W.)**, 129 feet above the water, visible 17 miles, and shown from a white conical tower 67 feet high, with covered way to dwelling; the fog signal is about 260 yards southeastward from the light. Another tower, no longer used, is about 300 yards to the southwest. A Coast Guard station and numerous houses are near the light.

See Appendix for **storm warning** displays.

Chart 325.—Portland Harbor, at the western end of Casco Bay, is the most important deep water, ice-free harbor on the coast of Maine, open to shipping throughout the year, that offers secure anchorage to the deepest draft vessels in all weathers. It has considerable domestic and foreign commerce in petroleum products, wood pulp, paper, sulphur, coal, china clay, scrap iron, and general cargo. It is also the Atlantic terminus of pipeline shipments of petroleum products to Canada and coastal points.

The **outer harbor** comprises the area westward of Cushing, Peaks, House, and Great and Little Diamond Islands from the entrance at Portland Head to the entrance of Fore River at **Fish Point,** including the three deep water general anchorages, and the oil discharging berth westward of **Spring Point.**

The **Inner Harbor** is considered to be in two sections; the outer part or **Main Harbor,** extending from the entrance of Fore River to the Portland Bridge; and the inner part, or **Fore River,** from the Portland Bridge to head of deep water navigation at the combined fixed railroad and highway bridge.

Portland, an important manufacturing, fishing, and industrial center, is on the north side of the inner harbor with all the railroad, coal, bulk and general cargo terminals and piers. **South Portland** is on the south side of the harbor with most of the petroleum handling terminals and pipeline facilities along its waterfront.

The main approaches to the harbor are, from the southward from Portland Lightship, or from the eastward from Halfway Rock Light, to the entrance of the harbor between Portland Head, Ram, and Cushing Islands. **Portland Head Light (43°37.4′ N., 70°12.5′ W.)**, 101 feet above the water and visible 16 miles, shown from a white conical tower, 80 feet high, connected to a dwelling, marks the south side of the entrance. A fog signal is at the light station.

Ram Island Ledge Light (43°37.9′ N., 70°11.2′ W.), 77 feet above the water and visible 14 miles, shown from a light gray, conical, granite tower, is on the ledge, bare at low water, about 400 yards south of Ram Island, and marks the north side of the entrance; a fog signal is at the light.

Cushing Island, on the east side of the entrance, is mostly grass covered. **White Head** is a bluff at its northeastern end. A pier is in the cove on the north side.

Whitehead Passage, between Cushing and Peaks Islands, has a depth of about 24 feet. It is sometimes used by smaller vessels approaching the harbor from the eastward. The principal dangers in it are marked, but the channel is narrrow, and strangers are advised to use the main channel.

Peaks Island is the large island northeastward of Cushing Island. It has communication with Portland by automobile ferry. Several wharves are on the west side. **Peaks Island** (P.O.) at **Forest City Landing,** is a village on the south end, and **Trefethen** is a village on the north end. **Pumpkin Nob,** 51 feet high, is about 150 yards north of the northern extremity of Peaks Island; a lighted bell buoy is off its eastern side.

House Island, also on the east side of the main channel, northward of Cushing Island, is the site of the abandoned quarantine station. An old fort on the southwest end is conspicuous, and the summit of the northeastern part of the island is marked by a house and flag pole. **House Island Light,** 23 feet above the water on a black skeleton tower with a small black house is on the north end of the island, and **Fort Scammel Point Light,** 35 feet above the water on a red skeleton with small red house, and visible 8 miles, is on the south end.

Great and Little Diamond Islands, northwestward of Peaks Island are connected by a sand bar covered at high water. Little Diamond has many houses visible on it, and a former Coast Guard buoy pier on its east side. Small bay vessels from Portland call at the landings at wharves on the south end of both islands.

A channel between Peaks Island and Little and Great Diamond Islands is marked only at its northeastern and southwestern ends, and is used only by the smaller bay vessels and small craft. To carry the best water, pass 50 yards off the old buoy pier on Little Diamond Island and the wharf on the south end of Great Diamond Island.

Gasoline, fresh water, some provisions, and supplies are available at the former buoy pier.

Fort Gorges, a conspicuous gray stone structure, is on **Diamond Island Ledge,** about 0.75 mile northwestward of House Island. The ledge has a large area bare at low water and a few spots bare at high water. **Diamond Island Ledge Light** marks the west end of the ledge. The south and east sides of the ledge are marked by buoys. The wreck of a six-masted schooner about 700 yards 018° from Fort Gorges is no longer visible.

A stone tower about 0.25 mile southward of Portland Head Light is conspicuous as is **Chimney Rock** about 300 yards southeastward of the tower. **Ship, Maiden,** and **Simonton Coves** are small coves on the west side of the main channel; important only as summer anchorages for local pleasure craft.

Spring Point is on the west side of the channel about

1.8 miles northwest of Portland Head Light. The buildings at Fort Preble on, and southward of, the point are conspicuous. A breakwater is on the ledge which extends about 300 yards northeastward of Spring Point. **Spring Point Ledge Light (43°39.1′ N., 70°13.5′ W.)**, 54 feet above the water and visible 13 miles, and shown from a white conical tower on a black cylindrical pier, is on the end of the breakwater. A white sector in the light from 330° to 337° marks the fairway of the main channel in the entrance; a fog signal is at the light.

About 500 yards northwestward of Spring Point Light is the 975-foot deep water berth of Pier 2 of the Portland-Montreal Pipeline Corporation. A light marks the outer end of the berth. Portland Breakwater Daybeacon, an abandoned lighthouse, about 500 yards westward of the pipeline pier, marks the south side of the entrance to the inner harbor and Fore River.

On the bluff above and westward of Fish Point on the north side of the entrance, is the city of Portland. There are numerous conspicuous landmarks on the bluff and in the city, most of which are charted. One of the most conspicuous and historical is the old observatory tower which resembles a lighthouse. The grain elevator at the Canadian National Railroad Terminal is very conspicuous.

Boundary lines of inland waters.—The lines established for the coast of Maine are described in **§ 82.5**, Chapter 2.

Channels.—The main entrance is from the southward, between Ram and Cushing Islands on the north, and Portland Head on the south. Depths of 40 feet or more can be taken well into the outer harbor to the pipeline berth west of Spring Point, or to the anchorages in Diamond Island Roads, or westward of Diamond Island Ledge.

In addition to the main entrance from the southward, there are several entrances and channels from eastward and northward between and westward of the islands, some of which have been described previously. These are seldom used except by local vessels familiar with them or by small craft.

The broken ground in the approach to Portland Harbor has been examined by wire drag, and the dangers are shown on the charts.

A Federal project provides for an anchorage area in Diamond Island Roads 35 feet deep; an anchorage area 30 feet deep off the eastern end of the city, northwestward of Diamond Island Ledge; a channel 35 feet deep from the sea to the dual railroad and highway bridge at the head of deep water navigation in Fore River; a turning basin 35 feet deep in Fore River below the site of the old Vaughan Bridge; a channel 30 feet deep from the 30-foot anchorage to the Grand Trunk Railroad Bridge; a channel 14 feet deep between that bridge and Tukey Bridge; a channel 12 feet deep from Tukey Bridge to 2,500 feet upstream of the bridge; removal of ledges in the main ship channel to a depth of 40 feet; and the maintenance of Soldier Ledge Channel in Hussey Sound, Casco Bay, at a depth of 40 feet.

These channels are maintained at or near project depth with the exception of the channel from the 30-foot anchorage to the head of Back Cove. In 1958 it was reported that the channel from a point about 500 yards above Tukey Bridge to the head of the cove had been abandoned. The remainder of the channel in Back Cove above Tukey Bridge is unusable owing to the bridge being inoperative due to the construction of a new fixed highway bridge adjacent to it. In May 1959 the controlling depth from the 30-foot anchorage to the Grand Trunk Bridge was 17 feet and about 13 feet above the bridge.

In 1958 it was reported that 35 feet could be taken to the Canadian National Railroad and State Piers and the oil berths on the south side of the river below Portland Bridge, and 32 feet to the berths and terminals above the Portland Bridge in Fore River, at any stage of the tide.

West of Great and Little Diamond Islands a buoyed channel 22 feet deep connects Casco Bay with the 35-foot anchorage in Diamond Island Roads.

A channel dredged to 15 feet and marked with daybeacons and buoys leads from the main channel in Fore River to the two mole type piers of the Coast Guard base and buoy depot in South Portland about 0.5 mile northeast of Portland Bridge.

Back Cove is on the north side of Portland. The cove is now of little commercial importance. The wharf of a food and seafood processing plant, on the north side of the cove between the Grand Trunk and Tukey Bridges, has 10 feet alongside. There is an oil handling berth on the north side of the entrance to the cove outside the railroad bridge.

Anchorages.—Secure anchorage for any vessel is available at all times in Portland Harbor. Anchorage grounds have been prescribed for the harbor; limits and regulations are given in **§ 202.132**, Chapter 2.

A special small-vessel anchorage is between Little Diamond Island and Great Diamond Island; limits and regulations are given in **§ 202.1** and **§ 202.6**, Chapter 2.

Dangers.—There are numerous isolated dangers in the approaches to the harbor and the most important ones are marked. **West Cod Ledge** (Chart 315), a 6-mile long area of broken ground and isolated shoals sits across the entrance from northeastward and southwestward. These include **Bulwark Shoal, Bache Rock, West Cod Ledge Rock, Corwin Rock, Alden Rock, Old Anthony Rock, and East and West Hue and Cry.** The most important and largest of the shoal areas are buoyed, and the deep natural channels between them afford a clear approach to the harbor in clear weather from several directions.

A second barrier of shoals extending from Ram Island Ledge to Cape Elizabeth includes **Witch Rock, Jordan Reef, Pine Tree Ledge, Willard Rock, Trundy Reef, Broad Cove Rock,** and **Mitchell Rock** (Chart 315), almost all of which are buoyed. Several deep clear channels between them afford approach and entry well into the harbor of the deepest draft vessels.

In the harbor entrance there are several isolated shoal

depths with from 31 to 36 feet over them. All are charted and most of them are marked and can be easily avoided in clear weather.

Bridges.—There are two bridges over Fore River; the Portland bridge has a bascule span with a clearance of 31 feet; operating regulations are given in **§ 203.25,** Chapter 2. The dual railroad and highway fixed bridge at the head of deep water navigation in Fore River has a clearance of 10 feet.

The old Vaughan Bridge has been removed and the channel cleared to a depth of 35 feet for a width of 300 feet.

Two bridges with swing spans cross Back Cove; the railway bridge has a clearance of 5 feet, and the Tukey Bridge has a clearance of 3 feet.

In November 1958 the swing span of the Tukey Bridge was inoperative and a new fixed highway bridge to replace it was under construction adjacent close eastward of it, with a designed clearance of 30 feet.

Directions.—Portland Harbor and its approaches have been examined by means of a wire drag from Fort Forges, at the entrance to the inner harbor, to a depth of about 18 fathoms off the entrance, and a little farther in places. This dragged area covers all of the broken ground eastward and northeastward of Cape Elizabeth, except those dangers within a distance of 0.5 to 1 mile of the shore.

The broken ground off the entrance to Portland Harbor renders the entrance by vessels dangerous in thick weather unless sure of position. The deep natural channels between the shoal areas, which are for the most part well marked, give good access to the harbor from several directions and no difficulty should be experienced by due attention to the chart and the aids.

Tides and currents.—The mean range of the tide is 8.9 feet. Daily predictions of the times and heights of high and low waters for Portland are given in the Tide Tables.

The average velocity at strength of the tidal current in the channel is about 1 knot southwest of Cushing Island and southwest of Diamond Island Ledge; within the harbor it is about 0.5 knot. See Tidal Current Tables for current predictions.

Weather.—The prevailing winds are southwesterly during the summer and northerly during the winter. At all seasons the heaviest gales are usually from the northeastward or eastward. See Appendix for **storm warning** displays.

Fogs.—Fogs occur most frequently during June, July, and August. At the head of the bays and within rivers it is often comparatively clear when it is thick outside. Winds from the east to the southwest by way of south bring fog; westerly and northerly winds clear it away.

During August and September it is occasionally foggy or smoky in the harbor in early morning when it is clear outside.

Ice seldom obstructs navigation; when it does it is only for a limited time. The towboats keep a clear channel to the wharves.

Pilotage is compulsory for all vessels in foreign trade drawing 9 feet or more except coasting or fishing vessels. The pilot boat meets incoming vessels at the Portland Lightship. Vessels desiring a pilot should radio or telegraph ahead to Portland Pilots, Portland, Maine, stating time of arrival at the lightship. The customary signals are used when off the lightship.

Towboats are available and are used by most large vessels when docking either above or below the bridges, and when passing through the bridges. They meet vessels at the anchorage as desired. The tugs are modern and are fully equipped with radar and ship-to-shore voice radio, firefighting, some salvage and other modern equipment. There are two **fireboats** in the harbor.

Quarantine.—Quarantine is enforced in accordance with the regulations of U.S. Public Health Service. The quarantine office and outpatient clinic is at the former Marine Hospital on Martin Point.

Customs.—Portland is a port of entry and marine documents are issued.

Immigration.—Immigration and naturalization officials are stationed at Portland.

Quarantine, immigration and customs officers usually board vessels at the dock.

The **Board of Harbor Commissioners** in Portland has jurisdiction over the piers to the pierhead line, checks on harbor pollution, establishes pilot rates and appoints harbor pilots, and establishes harbor rules to be enforced by the **harbormaster** and deputy.

The **Maine Port Authority** with offices on the State Pier administers and fosters the development of maritime activities in the State of Maine.

Wharves.—In the port there are at present 11 berths for deep-draft cargo vessels and eight oil handling berths for deep-draft tankers with depths alongside ranging from 30 to 35 feet. In the outer harbor there is an oil handling berth for super tankers with 42 feet alongside. There are two coal handling berths with unloading and conveyor equipment with 25 feet alongside, and 16 fish and seafood handling piers. There are three cold storage and three dry storage warehouses in the port and covered shed area to accommodate up to 75,000 tons.

There are also facilities for unloading and storage of china clay, and ample open ground storage space for the discharge of lumber, coal, or other bulk cargo. The two principal terminals of the port are the Grand Trunk (Canadian National) Railroad Terminal and the Portland Terminal Company, a subsidiary of the Maine Central Railroad. The belt line railroad of the latter serves most of the piers and cargo handling facilities of the port. The Grand Trunk Grain Elevator has a capacity of 1,500,000 bushels and conveyors to both sides of Pier 3 of that terminal.

Supplies.—Bunker coal, diesel oil, and fuel oil can be obtained at the piers, from lighters, or barge. Water may be obtained from the piers or by water barge. The city water is considered so pure that it requires no treatment of any kind. Gasoline, ice, provisions, yacht and ship supplies can be obtained in any quantity and ship chandlery is available in the port.

Repairs.—There are no drydocks in Portland. A large ship repair firm in the port has fully equipped machine,

pipe, joiner and welding shops, and can handle above water hull and steam or diesel engine repairs of any size. The firm has a 10-ton floating crane. There are four 25-ton gantry cranes at the pier of the former ship building yard at South Portland, and four 10-ton cranes on Pier 3 of Portland Terminal Company.

A large boat and yacht yard in South Portland has three marine railways, the largest of which with a capacity of 1,000 tons can haul out craft up to 200 feet in length and 18-foot draft. The yard has complete machine, carpenter, pipe, paint, electric, propellor and welding shops, and can carry out all marine repairs to yachts and commercial craft. The yard maintains guest moorings and there is a depth of from 10 to 15 feet at its 400-foot pier. Gasoline, diesel oil, water, yacht supplies, and marine equipment can be obtained; restrooms, and telephone service are available. The yard permits overnight mooring at its pier with electricity available. Open and covered dry winter storage is available at the yard. A small yacht service yard is on the South Portland side a short distance above it.

Small craft facilities.—There are ample small boat facilities in the port where all services can be obtained either at the piers on the Portland side of the river, in the stream from service craft, or at the yacht yards on the South Portland side. The combined town landing and pier of the Centerboard Yacht Club in South Portland has two floats with 10 feet alongside, and there is a depth of 6 feet alongside the pier. Restrooms are available at the club. Gasoline, diesel oil, and water can be obtained at the service piers or from fuel barges which serve vessels in the stream. Yacht supplies, food, ice, and ship chandlery can be obtained in any quantity in the port.

Communications.—Portland is served by three main line railroads and is the terminus of the Grand Trunk (Canadian National) Railroad. There are many trucking firms engaged in long and short haul trucking from the port. Bus service connects with all points in New England. Telephone and telegraph communication is available.

9. CAPE ELIZABETH, MAINE, TO CAPE ANN, MASSACHUSETTS

Charts 1205, 1206.—From Cape Elizabeth the coast of Maine continues southwestward for about 37 miles to the Piscataqua River and the deep-water port of Portsmouth, New Hampshire. The few harbors along this part of Maine are suited mostly to fishing vessels, yachts, and small pleasure craft. This is a summer-resort area and many of the buildings are large and prominent. A tall water tank southwestward of Wood Island Light is the most prominent object between Portland and Portsmouth.

Extending south-southwestward from Portsmouth Harbor is the 13-mile coast of New Hampshire; the Isles of Shoals are 6 miles southeast of the harbor. Southward and eastward from the New Hampshire line the extreme northern part of the Massachusetts coast extends about 23 miles to Cape Ann Light. The Merrimack River, approach to Newburyport, Massachusetts, is about 3 miles south of the New Hampshire boundary.

Boundary lines of inland waters.—The lines established for this part of the coast are described in **§ 82.5**, Chapter 2.

Chart 231.—Cape Elizabeth Light and Portland Lightship are described in Chapter 8.

Seal Cove, on the southeast side of Cape Elizabeth and northeastward of Richmond Island, has numerous rocks and ledges. **The Sisters** and **Seal Rock,** dangers near the center of the cove, bare at about half tide. The eastern extremity of Seal Rock is marked by a buoy which facilitates entrance to the anchorage north of the rocks. The holding ground in the cove is sand and poor, but some shelter is afforded in easterly weather north of a line between **McKenney Point** and Seal Rock, but care should be taken to stay clear of unmarked **Crowell Rock. Stevens Rock** about 650 yards southward of Seal Rock is also unmarked. There are several fish wharves in the cove dry at low water; no services are available.

Richmond Island, about 0.5 mile south of Cape Elizabeth and connected to it by a breakwater, is partly wooded with a conspicuous barn on it. The breakwater is awash at high water and submerged at extreme high water in many places.

Richmond Island Harbor, westward of Richmond Island and the breakwater, is sheltered from northerly and westerly winds, but is exposed to southwesterly and southerly winds. Foul ground extends 0.4 mile from the northern side of the harbor. The depths shoal gradually from 45 feet at the entrance to 15 feet 350 yards from the breakwater at the head. The holding ground is good, sand and mud. The anchorage is used considerably by yachts and small craft.

Chimney Rock, 0.3 mile from the north shore of Richmond Island Harbor, is awash at low water and is marked on its southeast side by a buoy. Vessels must pass southward of the buoy. A rock with a depth of 16 feet on it is 0.2 mile east-southeastward of Chimney Rock; an 18-foot spot 0.3 mile east-northeastward, and a 12-foot spot about 0.5 mile east-southeastward, are all unmarked.

An unmarked rocky ledge with a depth of 16 feet near its southwest end is about 0.4 mile westward of **Ram Island,** low and grassy, which is 0.2 mile northwestward of Chimney Rock. **The Brothers,** three small rocks, are 300 yards north-northeastward of Chimney Rock.

Spurwink River, 1.6 miles northwestward of Richmond Island, can be entered only by small craft at half tide or higher with a smooth sea. **Higgins Beach,** on the west side at the entrance, has many visible cottages. The river is narrow and crooked and there are no facilities. A bridge crossing the river about 1.7 miles above the mouth has a clearance of 5 feet. An obstruction with a depth of 8 feet over it is about 500 yards off the entrance to the river.

Old Proprietor, a ledge bare at low water, is 0.9 mile from shore and 1.8 miles westward of Richmond Island. The ledge is marked on its south side by a buoy. A ledge with 11 feet over it about 0.5 mile and a 17-foot spot about 0.7 mile north-northeastward of Old Proprietor are both unmarked.

Between Richmond Island and Wood Island Light, a distance of about 6 miles, the shore forms a large open bight, the southern part of which is **Saco Bay.**

Prouts Neck, a conspicuous point, 3 miles westward of Richmond Island, is the northern point of Saco Bay. The neck is partly wooded and has many houses. A standpipe and an old observation tower on Prouts Neck and another standpipe on **Blue Point Hill** 2.3 miles northwestward are conspicuous.

The Prouts Neck Yacht Club and float landing are on the west side and close northward of a short stone breakwater. There is reported to be a depth of 7 feet of water at the float. Restrooms are available at the clubhouse and fresh water at the float. Approach to the float should be made with caution as there is reported to be a sunken rock close southward of it. **Prouts Neck** (P.O.) is a village on the neck.

Scarboro River enters the sea about 0.6 mile northwestward of Prouts Neck. The river and its tributaries, the

Libby and Nonesuch Rivers, are used by local fishing and pleasure craft in considerable number at half tide or higher. There are many fishing piers and private float landings on these rivers, most of which are dry at low water.

A Federal project provides for a bar channel 8 feet deep, and an entrance channel 6 feet deep to an anchorage basin of the same depth. In 1958 the bar and entrance channel had a controlling depth of less than 1 foot with 5 feet in the anchorage basin northward of Pine Point.

In 1959, however, it was reported that at or near mean low water, with local knowledge, 3 to 4 feet could be taken across the bar and in the channel to the basin in small craft in calm weather with smooth sea. Under any other conditions the river should not be entered by strangers.

The approach to the bar channel is marked by a lighted bell buoy. The bar and entrance channel is marked by buoys which are frequently shifted in position with changing conditions. Following protracted spells of bad weather the positions of these buoys should not be relied upon as they often do not indicate the best water.

The limits of the anchorage basin are marked by buoys. At the end of a pier on the south end of the basin there is reported to be a depth of 10 feet, but approach to it is complicated at or near low water by two sand bars extending to the westward and eastward from it.

In May 1959 there was a gas pump on the end of the pier, and a store at the root had some supplies, bait, tackle, and a snack bar. Gasoline, oil, and other supplies and provisions were obtainable in the village of **Pine Point** a short distance from the pier. The beach at the pier is suitable for launching small craft from trailers near high water.

Along the shore of Saco Bay from northward to southward are **Grand Beach, Old Orchard Beach,** and **Ferry Beach.** The large hotels, the pier, and the standpipe at Old Orchard Beach are prominent.

Bar Ledge, with a depth of 11 feet, is 0.9 mile from shore off Grand Beach, and is marked on its southern side by a buoy. About 0.6 mile westward of the buoy and 0.7 mile northeastward of the pier at Old Orchard Beach, **Little River Rock,** with a depth of 2 feet over it, and extending 0.5 mile from shore, is unmarked.

Goosefare Brook enters the sea at the south end of Old Orchard Beach. The brook is foul and the piles of an old highway bridge block the river near the entrance. About 150 yards farther upstream is State Highway No. 9 bridge with little or no vertical clearance. A swimming pool and a signal yard and mast are just west of the highway bridge on the north bank. In 1959 several small craft were moored in the creek; there are no facilities.

Stratten and Bluff Islands, grass covered, are off the northern part of Saco Bay, 1 mile southward of Prouts Neck. Deep water is between the islands and Prouts Neck, but between the islands are numerous ledges. Ledges, awash at low water, are 0.3 mile off the eastern side of Stratten Island and 0.2 mile off the southwestern side. The ruins of a house are on Stratten Island. Two chimneys of the house remain standing and are conspicuous.

Islands and ledges in the southern end of Saco Bay extend up to 1.5 miles from the shore. Inside of the islands are Wood Island Harbor and the entrance to Saco River.

Eagle Island, 2.5 miles southwest of Stratten Island, and Ram Island, 0.7 mile south of Eagle Island, are rocky and grass covered; vessels should pass eastward of these islands, giving them a berth of at least 0.5 mile. There is a house on Ram Island. **Ram Island Ledge,** extending 0.5 mile east of Ram Island, has a least depth of 7 feet, and is marked by a buoy on its eastern side.

Wood Island, 8.7 miles southwestward of Cape Elizabeth Light and eastward of the entrance to Saco River is wooded. **Wood Island Light (43°27.4′ N., 70°19.8′ W.),** 71 feet above the water and visible 14 miles, is shown from a white concrete tower connected to a dwelling, on the east end of the island; a fog signal is at the light. **Negro Island Ledge,** 0.2 mile north of Wood Island, has a least depth of 9 feet and is marked on its north side by a buoy.

Negro Island, low and grassy on top, is just westward of Wood Island. Ledges extend nearly 200 yards northwestward and 300 yards southwestward from Negro Island; a buoy marks the southwest end of the ledge.

Stage Island, 0.6 mile west of Wood Island, is marked by a prominent stone monument. **Stage Island Shoal,** partly bare at low water, extends 300 yards east-northeastward from the island and is marked at its end by a buoy. Wood Island Harbor, southeastward of the island, is described following the discussion of Saco River.

Basket Island, 0.3 mile west of Stage Island, is grassy and has several cottages.

Saco River, with its entrance in the south end of Saco Bay west-northwestward of Wood Island, is the approach to the cities of **Biddeford** (P.O.), on the south bank, and **Saco** (P.O.), on the north bank. The cities are at the head of navigation 5 miles above the mouth of the river. In 1959 there was no commercial traffic on the Saco River. A party fishing boat operates from the pier at **Camp Ellis,** a settlement on the north bank of the river at its mouth. A pilot for the river resides there.

The entrance to the river is between two jetties. The southerly jetty, submerged at high water, is marked by a buoy off its eastern end and by piers about 260 yards apart and about 10 feet above high water on the jetty. The outer 0.4 mile of the northerly jetty is partly covered at high water, and the outer end of it is also marked by a buoy.

A Federal project provides for a channel 8 feet deep from the entrance of Saco River to Biddeford. In 1959 the channel was reported to have shoaled to a least depth of about 2 feet. The bar at the entrance is subject to frequent change.

Small craft can enter the river with a smooth sea and on a rising tide by passing between Ram Island Ledge and Negro Ledge and following the buoyed channel over the bar. The best water leads from close southward of the buoy marking the end of the north jetty to the fairway buoy on **Lower Bar,** which buoy is shifted as the

channel changes. Passing this buoy close-to on the north side, a midchannel course should then be followed to off the pier at Camp Ellis.

The channel in the river is narrow and crooked, but picturesque. Strangers should have no difficulty by following the chart and entering on a rising tide. No attempt should be made by small craft to cross the bar in either direction on the ebb with an easterly wind. Several small craft have grounded in attempting to do so.

The mean range of **tide** is about 8.7 feet. From March to May the channel depths are liable to be changed by heavy floods as much as 8 feet above high water at Saco; this condition also causes dangerous currents.

Ice closes the river from January to April.

At Saco and Biddeford the old wharves are not kept in repair and are seldom used. Water is piped to the old coal wharf at Factory Island. At Saco there is a public float landing with 3 feet alongside and at the Saco Yacht Club next to it there is 7 feet, but there is reported to be a depth of only 2 feet in the approach to both floats.

There are no facilities at the yacht club, but gasoline, provisions, and supplies can be obtained in town only a short distance from both landings. There are two natural ramps in Saco where boats from trailers can be launched, one at the town landing and the other 100 yards south at a private boathouse where there is also a marine railway.

Gasoline, water, and provisions can be obtained at the pier at Camp Ellis. About 3.5 miles upriver from the entrance, or 2 miles below Saco on the north bank, there is a marina with a hard surfaced launching ramp where gasoline, water, ice, provisions, and supplies can be obtained. Winter open storage is available, as is parking and a telephone.

On the south bank of the river about 2.5 miles below Saco is a boatyard with marine railway that can haul out craft up to 40 feet in length and build inboard and outboard motor or sail craft up to 32 feet in length.

At Biddeford an overhead power cable crossing the river from Factory Island has a permit clearance of 123 feet.

Wood Island Harbor, south of Wood and Stage Islands, is an anchorage for small and moderate-sized vessels. Anchorage in depths of 18 to 36 feet is available south of Wood Island. Between Negro Island and Stage Island are depths of 17 feet or more in an area about 400 yards across; it is reported that larger yachts anchor in this area.

Small craft can proceed to the southwestern part of the harbor and anchor in depths of 6 to 18 feet off **Halftide Rock,** 0.3 mile south of Stage Island. In entering this part of the harbor it is well to give the eastern side a good berth as there is an unmarked rock awash about 270 yards northeastward of the buoy marking Halftide Rock. The bottom in this inner anchorage is reported to be soft mud.

The Pool is a shallow bay making southwestward from Wood Island Harbor inside **Fletcher Neck,** the south shore of Wood Island Harbor. The entrance is about 50 yards wide.

A Federal project provides for an anchorage basin 6 feet deep southwestward of Fishermans Wharf just inside the entrance to The Pool. In September 1956, the controlling depth was 6 feet except for a small ledge area on the northerly limit of the basin which had a depth of 3 feet.

In May 1959 it was reported locally that the basin had shoaled considerably, more especially on the southeastern side where three stone ice breakers have been installed. Care should be taken by strangers not to anchor too close to them. They are difficult to see at night at or near high water. Neither should they attempt to go between the northeasternmost breakwater and Fishermans Wharf as a submerged breakwater between the breaker and the wharf is visible only at extreme low tide.

Small craft anchor just inside the inner end of the entrance, which is locally known as **The Gut,** if there is room. No attempt should be made to anchor in The Gut as the tidal currents have considerable velocity and holding ground is poor. Local fishing and pleasure craft usually occupy most of their moorings but permission can usually be obtained to occupy one of the unoccupied ones.

Biddeford Pool (P.O.) is a village on the south side of Wood Island Harbor, extending from The Pool nearly to the eastern point of Fletcher Neck. There are small wharves on each side of the entrance to The Pool.

The Biddeford Pool Yacht Club and the town wharf both with 12 feet alongside are at the inner end of The Gut on the east side, with a private wharf just to the northeast at the outer end of which the Coast Guard patrol craft usually moors.

Fresh water is piped to the yacht club float and the club maintains one plainly marked guest mooring. Restrooms and lounge are in the club. Gasoline, provisions, and most marine and yacht supplies can be obtained at a filling station and stores near the landings. Meals, lodging, and most services are obtainable in the village.

To enter Wood Island Harbor from the northeast, keep about 0.5 mile north of Wood Island, until near the fairway bell buoy eastward of Ram Island Ledge. Pass about 100 yards southeastward of this buoy, heading for the monument on Stage Island, until Negro Island is abeam, then select anchorage in the area midway between Negro and Stage Islands.

If proceeding to the southwestern or lower end of the harbor pass about 100 yards eastward of the buoy 0.2 mile northeastward of Stage Island and from a position midway between Negro and Stage Islands head in a southwesterly direction for The Gut, being careful to give the east side and the rock awash northeastward of Halftide Rock a good berth. Select anchorage northwestward of Halftide Rock Daybeacon 9.

If continuing on to the anchorage basin in The Pool, favor the northwesterly side until in The Gut then midchannel to the buoy at the inner end.

If anchorage is desired southward of Wood Island,

the best approach from northward is to the eastward of Wood Island. From a position 300 yards due east of Wood Island Light, head for the end of the bluff on the eastern extremity of Fletcher Neck until the monument on Stage Island opens up south of Wood Island; then bear around to the westward and head for the daybeacon on Philip Rock. Select anchorage from 150 to 250 yards off the middle of the island eastward of the cable area.

If coming from the southeastward, head for the middle of Wood Island to pass midchannel between the daybeacon on Washman Rock and the buoy southward of Dansbury Reef. When about 200 to 250 yards off Wood Island on this leg bear sharp around to the westward and select anchorage from 150 to 250 yards off the middle of the island.

If coming from the southeastward and bound for Wood Island Harbor, continue as in the preceding paragraph to pass 50 to 100 yards south of the buoy, southwestward of Negro Island. Hold the course until The Gut opens up westward of the daybeacon and buoy marking Halftide Rock, being careful to clear the rock awash about 270 yards northeastward of buoy 7. Then bear around to the southwestward and select anchorage northwestward of Halftide Rock; or if desirable continue on inward through The Gut into The Pool.

The chart must be the guide at all times. Proceed no farther until each aid to navigation is properly identified and passed correctly.

Washman Rock, bare at half tide, is near the end of a reef which extends 600 yards southeastward from the eastern point of Fletcher Neck; a daybeacon marks the reef.

Dansbury Reef, 0.5 mile southward of Wood Island Light, is a small ledge with shallow water over it and is marked on its southeast side by a buoy. There are several shoal spots between the reef and Wood Island, and strangers should not pass between them.

Numerous rocks and ledges extend 0.6 mile southeastward of Fletcher Neck. A Coast Guard station is on the east side of Fletcher Neck. Its cupola and signal towers are conspicuous, as are the many large homes on the neck.

See Appendix for **storm warning** displays.

Chart 1205.—Goosefare Bay, 5.4 miles southwestward of Wood Island Light, is a shallow cove, full of rocks and ledges. The coast between Fletcher Neck and Goosefare Bay is lined with summer homes, some very large and prominent. A large stone mansion with four large stone chimneys on **Hoyt Neck,** about 2.5 miles southwest of Fletcher Neck, is very conspicuous.

Little River and **Batson River** empty into Goosefare Bay. Both are used by small fishing and pleasure craft. There are private float landings and several small fish piers but no facilities in Little River. Overhead power and telephone cables with clearances of about 30 feet cross Little River about 0.5 mile above the mouth.

The entrance to Batson River appears clear and deep and though some small craft were observed there in 1959 no landings were seen. Navigation is terminated by a dam at the highway bridge about a mile above the mouth.

Stage Island Harbor, 6.7 miles southwestward of Wood Island, is a small slough used by small local craft. The entrance is about 50 yards wide between the reefs making northward from **Cape Island** and southward from **Little Stage Island;** it is not safe for strangers. The ruins of a house is on Little Stage Island, the southern half of Stage Island.

Cape Porpoise Harbor, about 7.5 miles southwestward of Wood Island Light, is a safe and protected harbor. It is ideal for the many fishing and pleasure craft that base there. It is midway between Portsmouth and Portland, and is often a welcome haven for cruising craft caught in a blow on this stretch of coast.

Seiners sometimes enter for shelter though the anchorage is somewhat restricted by size and depth for the larger vessels.

The principal hazard in approaching and entering are the numerous lobster pot buoys, which are in the channel and outlying waters in the summer. Care should be taken to avoid these, especially at night or during periods of low visibility. There are no marine railways on which to haul out to clear a fouled propeller.

The village of **Cape Porpoise** (P.O.), around **Porpoise Cove** at the head of the harbor, is historically important. Lobstering, fishing, a small amount of boat building, and summer tourists are the principal industries.

The principal mark for approaching is **Goat Island Light (43°21.5′ N., 70°25.5′ W.),** 38 feet above the water and visible 11 miles, and shown from a white cylindrical tower with a covered way to a dwelling, on the southeast end of Goat Island on the east side of the entrance; a fog signal is at the light.

A lighted whistle buoy is 1.85 miles southeastward of the light, and a bell buoy about 800 yards southeastward.

A water tank and a church spire at the head of the harbor are also good marks for entering.

A Federal project provides for an entrance channel 16 to 18 feet deep, thence a combined channel and anchorage 15 feet deep to the town wharf, and thence a 6-foot channel in Porpoise Cove from the town wharf to the limit of navigation near the head of the harbor. In September 1957 the controlling depth in the entrance channel was 13 feet, thence 10 feet in the combined channel and anchorage to the town wharf, thence 6 feet to the head of the harbor.

Dangers.—The Old Prince, a ledge that has a rock awash and extends from 400 to 550 yards southeastward of Goat Island Light, is marked by a bell buoy, 250 yards south-southeastward of it and a buoy about 100 yards westward of it. Local craft sometimes cut between Old Prince and Goat Island in entering, but is not advisable for strangers to do it.

Folly Island on the west side of the entrance is grassy. Ledges extending up to 0.3 mile south of the island are unmarked, but a buoy 300 yards southeastward of the island marks the west side of the approach to the bar channel. A white slatted tripod daybeacon marks the ledges extending northeastward from the island. This

daybeacon is 180 feet from the westerly edge of the entrance to the dredged bar channel and should be given a berth of at least 250 feet in entering.

Another daybeacon, a spindle on the ledge bare at low water about 370 feet southwestward of Goat Island Light, is about 30 feet from the easterly edge of the bar channel and should be given a berth of about 150 feet when entering.

About 300 yards above the light and the entrance daybeacons, on the westerly edge and inner end of the dredged bar channel, **Lobster Rock,** with a depth of 4 feet over it is marked on its northeast side by a buoy.

Anchorage.—The anchorage basin is usually occupied by local fishing and pleasure craft. The holding ground is good and a hole can usually be found to drop anchor in.

There are usually three spare town moorings, and if application is made to the operator of the service facility at the town wharf, who also acts as harbormaster, he will assign one or find an unoccupied mooring for a visiting craft somewhere in the basin.

There are about 10 berths in 7 feet of water alongside at the town wharf which are available for overnight berthing on a space available basis, preference being given to commercial fishing craft to unload their catch. Gasoline, water, bait, tackle, and restrooms are available at the wharf. A small crane is on the wharf; restaurants and lodging are closeby.

Ice, provisions, hardware, groceries, and yacht supplies can be obtained in, or on order from the village. A telephone is on the dock. There are no marine railways or repair yards, the nearest being Kennebunkport.

Good roads connect the landing with the village and nearby towns and cities. Taxi service is available.

Most of **Paddy Creek** just west of Cape Porpoise Harbor dries at low water.

Turbatt Creek has several private landings and considerable small craft activities. No services are available.

Southwestward of Goat Island Light is an area of broken ground, with depths of 17 to 33 feet, extending as much as 2 miles offshore in places. The area has not been closely examined. The light bearing 350° leads eastward of the broken ground.

On the point locally known as **Walker Point,** 1.8 miles southwestward of Goat Island Light a large mansion with four large stone chimneys is one of the most conspicuous landmarks in the area.

Near the head of the cove west of the point there is a stone breakwater behind which there is a town float landing. Local pleasure craft moor in the cove and there is reported to be a depth of 8 feet at the landing. There are no facilities.

Kennebunkport (P.O.), on the **Kennebunk River,** about 2.5 miles westward of Goat Island Light, and about 4 miles by water from Cape Porpoise Harbor, is a port of some maritime and historical interest, and a popular summer resort and yachting center.

There is considerable yachting and fishing activity on the river. The beach for 0.8 mile eastward, and 1.7 miles westward of the entrance is lined with hotels and summer homes, the largest and most conspicuous of which is a large white hotel on the east side of the entrance to the river.

The entrance to the river is between 2 stone jetties, the outer end of the easterly one, which is the longer of the two, being marked by **Kennebunkport Breakwater Light (43°20.8′ N., 70°28.6′ W.),** 25 feet above the water, visible 10 miles, and shown from a white skeleton tower.

The approach to the port is marked by two buoys and two spindle daybeacons, which also mark the principal dangers. The best approach is to the eastward of the buoys.

The outer bell buoy, about 1.3 miles southward of the entrance, marks the southeast side of a reef with 7- to 12-foot depths. The inner buoy marks the east side of the shoal which has rocks that are awash at the lowest tides, and which extends eastward from Fishing Rock.

Fishing Rock, which bares at half tide is marked by a daybeacon. The other daybeacon marks the southerly edge of **Oak Reef,** an extensive foul ledge area with a number of drying rocks and rocks awash, extending about 0.5 mile southward of Kennebunk Beach.

Some local craft prefer to approach the entrance through the passage between these two daybeacons but strangers are advised against it.

The river channel is marked by six buoys, the first a red nun off the root of the east jetty. No attempt should be made to pass eastward of this buoy because of a bad ledge between it and the jetty on which several craft, in attempting to avoid the sharp turn into the river by cutting inside of it, have grounded.

The best time to make the passage upriver is just after low water on a rising tide when the mud flats are still visible.

A Federal project for Kennebunk River provides for a channel 4 feet deep to just below the bridge at Kennebunkport. In 1958 the controlling depth was 3 feet, but it was reported in 1959 that with local knowledge, 5 feet could be carried to the bridge.

A highway swing bridge with a clearance of 4 feet crosses the river about 1 mile above the mouth; operating regulations are given in **§ 203.28,** Chapter 2.

Small pleasure and fishing craft secure to moorings placed wherever there is sufficient depth and swinging room in the river. There is a **harbormaster** in Kennebunkport.

There are numerous private piers and float landings on the river, most along the east bank. There are also a number of fish wharves and shipping plants on the upper river near the bridge.

The town landing on the east bank about 700 feet inside the entrance has six berths with 6 feet alongside. Water is piped to the wharf.

Rowboats and outboards are for hire at a float landing in a small cove just above the town landing. Bait and tackle are available at the float and there is a restaurant there.

The Kennebunk River Yacht Club, about 150 yards above the town landing, has all facilities except fuel at its clubhouse. Its basin protected by a stone jetty, the

upper and lower ends of which are marked by stone pylons, has floats with from 2 to 6 feet alongside. Water is piped to the floats.

The Arundel Yacht Club has a pier and float landing about 400 yards below the bridge. Modern facilities were being installed in its clubhouse in 1959.

There are two boatyards on the west bank across the river from Kennebunkport, one above and one just below the bridge, in **Kennebunk** (P.O.). The one below the bridge, which is also a marina, can haul out, build or repair sail or motor craft up to 60 feet in length and 6-foot draft. Dry covered or open winter storage is at the yard, as are all services, yacht and marine supplies. Ship chandlery is available, ice and provisions can be obtained. There is a depth of 6 feet at the floats and water is piped to them.

The yard above the bridge principally builds sail or motor craft up to 35 feet in length. Open dry winter storage is available.

Gasoline can be obtained by can from service stations near the west end of the bridge. All supplies, provisions, and services can be obtained in Kennebunkport at markets and stores at each end of the bridge. Ship chandlery is available as is telephone, bus and taxi service to other coastal and inland points.

Directions.—The chart should be the guide keeping well clear of dangers and following the aids. In southerly weather with heavy seas running it is hazardous to enter through the jetties on the ebb.

Kennebunk Beach (P.O.) is a village extending 1 mile westward of Kennebunk River entrance. Ledges extend 0.8 mile from shore southward of the village. A conspicuous ruin of a large stone house is on the end of a point extending 0.2 mile off the beach. A prominent yellow bluff at the western end of Kennebunk Beach marks the mouth of the Mousam River. One of the houses on the bluff is bright yellow and conspicuous.

Mousam River is used by local small craft. In May 1959 the entrance appeared to have a deep clear channel. A fixed highway bridge, with a clearance of about 3 feet each side of a center pier, crosses the river about 0.5 mile above the mouth. The westerly channel through the bridge appeared to be the deepest. There are private landings on the river but no services.

From Mousam River a beach extends southwestward about 1.3 miles to another inlet into which **Branch Brook** and **Merriland River** flow. A large house with a large brick chimney, on a jutting point about the middle of the beach, is discernible among the other summer homes that line the beach. The inlet does not appear to be passable except for very small craft.

Drakes Island Beach, extending from this inlet to Wells Inlet about a mile south-southwestward, is a resort of numerous summer homes. A foul area with many rocks awash extends about 0.7 miles off Drakes Island Beach and is unmarked.

Wells Inlet is used by local fishing and pleasure craft. There are private landings on the various streams, including **Webhannet River,** which flows into the inlet, but no services. The inlet is not marked. In 1959, only piling remained of an old government wharf on the north side of the entrance.

Wells Beach extends about 2 miles southward from the inlet to a bluff on which there are a number of prominent homes, one of which has a conspicuous pointed cupola.

Moody Beach extends southward 1.2 miles where it joins **Ogunquit Beach** which extends 1.2 miles farther to the entrance of **Ogunquit River.** The river runs southward, draining the marshes behind these beaches and enters the ocean at Ogunquit, 4.7 miles southward of Wells Inlet. There were some small craft on the river above the fixed highway bridge about 0.4 mile above the entrance.

The entrance to the river is not marked, and the swells break across it making it difficult and dangerous to enter even in calm weather. There are no services, but there are restaurants, parking lot, and picnic areas on the beach.

Ogunquit (P.O.) is a summer resort of historical importance, one of the beauty spots of New England. **Israels Head,** a prominent headland, overlooks the entrance to the river on the south.

The principal outlying dangers off these beaches are an unmarked shoal and foul area which extends about 0.5 mile off Wells Beach, and which has a number of drying rocks and rocks awash on it. **Bibb Rock,** which bares 2 feet, about 0.8 miles off the point at the north end of Moody Beach, is marked on its east side by a buoy.

The principal landmarks along this stretch of beach from Kennebunkport to Ogunquit are the large resort hotels at Bald Head Cliff; Ogunquit, Wells, and Kennebunk Beaches; the clock tower of the town hall, and spire and belfry of the church at Wells; a church spire about 1.3 miles southward of Wells; and the standpipes at Ogunquit and Kennebunk. The numerous summer homes, some large mansions, also stand out.

Perkins Cove, at the mouth of **Josias River,** 1 mile southeastward of Ogunquit, is a beautiful small landlocked harbor, very popular with yachtsmen, at which a number of fishing, pleasure, and party fishing boats base. The resort hotels and the summer playhouse at Ogunquit are added attractions.

The facilities of the harbor are controlled by the village corporation, and the moorings are under supervision of the **harbormaster,** who usually is found at the town float landing on the north side of the harbor by the footbridge.

Though small and crowded, its reputation among yachtsmen is that room and a mooring can always be found for one more craft.

A Federal project provides for an entrance channel 5 feet deep to an anchorage of the same depth in **Flat Pond** at the head of the harbor. The controlling depth was 5 feet in 1959, except for ledge areas on the south and west limits of the anchorage basin.

A fairway bell buoy about 0.8 mile northeastward of the entrance marks the approach, and two buoys mark the entrance.

The harbor is a safe haven for small craft caught in the stretch of coast in a sudden blow, but no attempt should be made to enter once the sea has made up, as

heavy swells break clear across the entrance during easterly weather, and for as long as two days after a heavy blow. Small craft may be beset in attempting to enter under such conditions.

The harbor is crossed, just above the town float, by a wooden double bascule footbridge, which is hand-operated by the harbormaster on request. It has a clearance of 15 feet.

Gasoline and fresh water are piped to the town float, which has 5 feet alongside. Restrooms are at the wharf. There is a restaurant and stores at the harbor. Ice, provisions, boat, tackle, marine hardware are available at the harbor or can be obtained at, or delivered from, Ogunquit. Meals and lodging are available nearby.

Telephone, taxi, and other services are available, and the main coastal highway passes a short distance from the harbor. An added attraction is a rustic foot trail from the harbor along the cliff to Ogunquit.

A marine railway on which craft up to 50 feet in length can be hauled out is at the east end of the town wharf. Open winter storage and use of the railway for repairs are on a do-it-yourself basis.

Bald Head Cliff, 11 miles southwestward of Cape Porpoise, is a prominent high point on which there is a conspicuous large white hotel with cupola, and out buildings.

Mount Agamenticus, 691 feet high, is the highest and southernmost of three peaks on a ridge 5 miles westward of Bald Head Cliff. The mountain is a prominent landmark for vessels cruising along this section of the coast.

Chart 211.—Weare Point, 2.3 miles southward of Bald Head Cliff, is a headland with several large houses on it.

Cape Neddick Harbor is a small open bight between Weare Point and **Barn Point** about 1 mile northwestward of Cape Neddick. There is good anchorage in 9 to 30 feet in the middle of the bight, which is protected by the reefs on each side of the entrance from all but southeasterly weather. Even then there is a hole on the southwestern side where smooth water is found in 7 to 10 feet.

The upper and western side is foul, and along with the Cape Neddick River, which flows into the head, dries out to about 350 yards below the fixed highway bridge. The bridge has a clearance of about 12 feet. Except at the lowest tides a channel several feet deep can be found to an anchorage above the bridge where local fishing and pleasure craft moor.

There are no landings but a hard beach is at the south end, west side, of the bridge, where small craft can be launched from trailers. There is a combined lobster pound, restaurant, and store where meals, some supplies, and provisions can be obtained. Restrooms are available.

A picnic grove is on the east side, south end, of the bridge where rowboats and outboards can be hired. Bait is available. It is a beautiful spot in a grove of trees.

The entrance to the harbor is buoyed and not difficult to enter with the aid of the chart. From a position about 750 yards eastward of Cape Neddick Light a course of 302° carries through the entrance to an anchorage in 12 to 30 feet, about 200 yards westward of the nubble off Weare Point. Use the lead if necessary to avoid getting too far up the harbor into the foul area at the head.

If coming from the northward and eastward give the buoy marking the reef southeastward of Weare Point a berth of at least 200 yards before hauling to the westward for the entrance. Pass about 100 yards south of the buoy and round up midchannel between the two entrance buoys on the course and select anchorage as given in the preceding paragraph.

If York Harbor is crowded, or it is getting late, or a quiet, peaceful mooring for the night is desired, it is a fair haven.

Cape Neddick, 14 miles southwestward of Cape Porpoise, is a prominent headland jutting out 1 mile from the coastline and terminates in a small rock islet called **Cape Neddick Nubble.**

Cape Neddick Light (43°09.9′ N., 70°35.5′ W.), 88 feet above the water, visible 15 miles and shown from a white conical tower, is on the summit of the nubble; a fog signal is at the light.

An overhead power cable with a clearance of 21 feet crosses the channel between the nubble and the cape. It is foolhardy for even small craft to pass through this channel, though lobster pot buoys were observed there.

The cape is now almost completely covered with homes, guest houses, hotels, motels, and restaurants, but there are a few trees and brush on the summit.

York Beach (P.O.) is a large village and much-frequented summer resort in the bights northward and southward of the cape. There are no wharves.

York Harbor, 2.5 miles southwestward of Cape Neddick and 5.5 miles northeastward of Portsmouth Harbor entrance, is the approach to the town and summer resort of **York Harbor** (P.O.), on the north side just inside the entrance of the **York River,** flowing into the harbor from the westward. The harbor is used by many fishing boats and pleasure craft.

The important landmarks approaching York Harbor are the large brick hotel on Stage Neck; an old war-time observation tower on the southern entrance point to **Godfreys Cove,** west of **Seal Head Point;** and a large imposing stone mansion with stone terraces on the north side of the cove. The large homes on the promotory from **East Point** to **Roaring Rock Point,** and a white church spire at **York Village** are also prominent.

Stage Neck is the peninsula 0.3 mile long on the north side of the harbor just inside the entrance. **York Harbor Entrance Leading Light (43°07.8′ N., 70°38.6′ W.),** 40 feet above the water and shown from a steel structure on Stage Neck, and a fairway bell buoy, about 1.13 miles east of the light, mark the entrance to the harbor. The light shows an intensified beam on the bearing 270°.

Western Point, on the south side of the entrance, is bare and rocky, while **East Point,** on the north side, has houses built out to its end.

The entrance to York Harbor is crooked and narrow, and leads between rocks, bare and submerged on both sides. The controlling depth in York River to York Harbor is about 10 feet.

In 1954, a rock covered by 2 feet was found at the edge of the channel about 24 yards east of Harris Island Point Daybeacon. Several craft in making too wide a swing around the buoy off the southwestern end of Stage Neck have brought up on it.

The channel is buoyed and easily entered by small craft in clear weather with the aid of the chart. **Currents** are strong and buoys sometimes are towed under. Boats drawing 10 feet are said to enter about 1½ hours after low water. Craft drawing up to 4 feet can navigate at low tide for 5 miles above the entrance.

In 1959, it was reported that with local knowledge 10 feet could be taken into the harbor at any stage of the tide, that the river can be navigated with 6-foot draft for 7 or 8 miles above the entrance, and that the six bridges encountered are reported to have a clearance of 6 feet.

There is limited **anchorage** off the service wharves at the head of the harbor in depths of 10 to 17 feet. Moorings under supervision of the harbormaster extend upriver as far as the Sewall Bridge, about 0.8 miles above the wharves.

The town maintains three guest moorings for visiting yachts in the reach below the wharves off the northwest side of Stage Neck. A town wharf is on the south bank just below the new highway bridge. No facilities are at this landing.

The **harbormaster** will on request meet visiting craft outside the harbor and pilot them in.

Dangers.—The approach to the harbor from the fairway bell buoy about 0.6 mile eastward of the entrance is free of dangers, and all shoals close to the channel edge are marked.

In closing the port coming alongshore from either northeastward or southward, give the shore a berth of at least 0.4 mile. Shoal water extending off **East Point** about 400 yards is marked by a buoy about 500 yards southeastward of the point.

Stones Rock, about 1.2 miles south of the entrance, is marked by a spindle daybeacon. An unmarked rock with 11 feet over it about 850 yards south-southeastward of Western Point breaks if any sea or swell is running and should be given a wide berth.

On the northern side of the approach **Millbury Ledge** with two drying rocks is unmarked. **Black Rocks,** two bare, rocky ledges north of the entrance are unmarked, but a rock with 5 feet over it and said to be plainly visible if the water is clear, is marked by a buoy.

The ledge extending northeastward from Western Point is marked by a buoy about 200 yards northeastward of the point. These two buoys are the first pair passed in entering the harbor, and should be passed about midchannel, with York Harbor Entrance Leading Light dead ahead on a course of 270°.

A rock with 3 feet over it, part of a ledge extending about 100 yards southeastward of **Fort Point,** the eastern end of Stage Neck, is marked on its south side by a buoy.

Rocks Nose, a bare ledge extending 150 yards northeastward from the shore on the south side of the entrance channel is marked by a buoy.

A buoy marks the ledge off the southwestern extremity of Stage Neck, and the sharp turn from the entrance channel up into the inner harbor. In making this turn, sharp seamanship is needed, especially on the strength of the ebb, to avoid setting over to the westward and bringing up on the rock ledge with 2 feet over it which lies about 24 yards eastward of **Harris Island Point Daybeacon.**

The ledge off the eastern end of **Bragdon Island,** the northeast end of which has 2 feet over it, is marked by a buoy which also marks the turn of the river to the northwestward off the wharves.

Bridges.—A new fixed highway bridge about 1.15 miles above the entrance with a clearance of 15 feet has been constructed about 200 yards above the site of the old highway bridge, which has been removed to its abutments.

The second fixed highway bridge, **Sewall Bridge,** about 1.7 miles above the entrance, was rebuilt in 1940, and is a replica of the first pile drawbridge built on the site in the colonial days of 1761. The present bridge has an imitation bascule draw which is not operable. The clearance is reported to be 6 feet.

Another fixed bridge for U.S. Highway No. 1, crossing the river about 3.5 miles above the entrance, is reported to have a clearance of 6 feet. The twin fixed highway bridges of the Maine Turnpike cross the river about 0.5 mile above the No. 1 highway bridge.

Directions.—Craft approaching and entering York Harbor in daylight with the aid of the chart and following the aids should have no problems. The most difficult problem is making the sharp turn at the buoy at the southwestern end of Stage Neck.

At all times but more especially at night it is well, after making the bell buoy off the entrance, to bring the leading light ahead on the bearing **270°** and, if at night, to run in on the intensified beam.

It would be prudent however, at night if the sea and swell are not too heavy to anchor in the hole eastward of Fort Point, just out of the channel in line with the two nun buoys, and wait for daylight before attempting the run into the harbor and negotiating the turn around Stage Neck. The buoys all have reflectors on them, however which should assist a night entry.

Small craft facilities.—The facilities for yachts and small craft in the harbor are full and complete. All services can be had, and ice, provisions, and supplies of all kinds are available or can be obtained, on order, on short notice. There are three service facilities along the waterfront with wharves and float landings, with 8 to 12 feet alongside. Gasoline, diesel fuel, and fresh water are piped to two of them. Overnight berthing at the landings is permitted.

A well-equipped marina and boatyard is on Harris Island just northwestward of the spindle daybeacon. There is a depth of 6 feet of water at the float, and gasoline and fresh water are piped to it. Diesel fuel can be obtained by truck. Its marine railway can haul out

sail or motor craft up to 50 feet in length for hull and engine repairs, or dry winter storage. Lodging and parking are available. Rowboats, outboards, and sailboats are for hire at the marina, including instructions on boat handling. Rowboats and charter fishing party boats are for hire at one of the service wharves in the town.

Chart 1205.—Vessels must observe caution to avoid the offshore dangers in the northern approach to Portsmouth. **Boon Island,** 5.7 miles southeastward of Cape Neddick is a small, low, rocky islet marked by **Boon Island Light (43°07.3′ N., 70°28.6′ W.),** 133 feet above the water and visible 18 miles. The light is shown from a gray granite conical tower connected to a dwelling. A fog signal is at the light. A spindle daybeacon is about 230 yards northwestward of the light.

Boon Island is surrounded by deep water, but there are numerous detached ledges in the vicinity. The easternmost is **Boon Island Ledge,** 2.8 miles eastward of the light; it is bare at extreme low water and has a lighted whistle buoy off its southeast end.

Vessels should not pass between this buoy and Boon Island Light as there is a shoal area with a least depth of 16 feet between them. If passing westward of the light, give it a berth of 2 miles or more to assure staying in a depth of more than 30 feet as there is a rocky shoal with 25 feet over it about 1.6 miles west-southwestward of it. Depths of less than 30 feet are up to 1.3 miles southward of the light.

Pollock Rock, with 17 feet on it, and **Southeast Shoal** with 21 feet on it, are 0.7 miles southwest and southeastward, respectively, from the light. **Sanders Ledge** with 26 feet on it, is about 1.2 miles south of Boon Island.

Caution.—U.S. Naval vessels may be operating with submarines in the area lying south and eastward of Boon Island. Escorting Naval surface vessels usually display a red flag, but may display the international code flag signal **HP,** meaning: **Submarines are exercising in the vicinity, you should navigate with great caution.**

The submarine operating areas are shown on charts 1205 and 1206.

Fishermen and others should keep well clear of vessels displaying this signal and should obey promptly any orders that may be given by commanding officers of Navy vessels.

Chart 211.—Between Cape Neddick and the entrance to Portsmouth Harbor, a distance of 8 miles, the shore is indented by York Harbor, already described; Godfreys Cove, a shallow bight seldom entered, and Brave Boat Harbor.

Brave Boat Harbor, 2 miles southwestward of York Harbor, has a few private landings but no facilities. Some local small craft were observed there but the surf is reported to break clear across the entrance with the least sign of weather. Two old railway trestles cross the streams entering into it about 0.2 mile above the entrance. A large mansion on the point about 0.35 mile northeastward of the entrance is conspicuous.

Cutts Island on the south of the entrance is connected with Gerrish Island to the south of it by a natural seawall of stones and rock thrown up by winter gales. It is conspicuous. A public beach is at the north end of the seawall.

Moores Rock with 5 feet over it and unmarked is about 0.5 mile eastward of the entrance to Brave Boat Harbor. A long drying reef is about 0.3 mile southeastward of the entrance.

Two dangerous ledges are 2.5 miles offshore: **York Ledge,** the northernmost, is 2.9 miles southeastward of York River and marked by a daybeacon; and **Murray Rock,** 1.5 miles south-southwestward of York Ledge, has a least depth of 8 feet. Murray Rock has a buoy off its southern side. A lighted whistle buoy is 1.5 miles eastward of Murray Rock and southeastward of York Ledge. Between these ledges and the shore, the bottom is very broken and vessels are advised to pass outside of the lighted whistle buoy. Broken ground with depths of 32 to 39 feet extends 2 miles south-southeastward of the buoy marking Murray Rock.

Portsmouth Harbor, 37 miles southwestward of Cape Elizabeth and about 25 miles northward of Cape Ann Light, is the only harbor of refuge for deep-draft vessels between Portland and Gloucester. The entrance is marked by a lighted whistle buoy, Whaleback Light, Portsmouth Harbor (New Castle) Light, and Portsmouth Harbor Channel Lighted Range.

The principal outlying dangers are marked so that no difficulty should be experienced when entering in clear weather, either in the daytime or at night.

Portsmouth Harbor is formed by the mouth of Piscataqua River, and is the approach to the cities of Portsmouth and Dover, and the towns of New Castle, Kittery, Newmarket, Durham, Newington, and Exeter.

The United States Naval base, including Portsmouth Naval Shipyard, Prison, and Hospital is on **Seavey Island,** at Kittery, on the north side of the harbor opposite Portsmouth.

Portsmouth, a city on the south bank of Piscataqua River about 4 miles above the entrance to the harbor, in 1959, had only one wharf in use in the city proper, that of the tugboat company, which had 25 feet alongside. The remainder of the wharves were in disuse, in various stages of disrepair, or in ruins.

Above the bridges, on the south bank of the river, the gypsum wharf, coal, oil, and cable wharves had from 19 to 37 feet alongside.

There is summer passenger ferry service to the Isle of Shoals.

Foreign trade was in gypsum, and petroleum products, with weekly arrivals in summer of shipments of gypsum from Nova Scotia in vessels drawing up to 18 feet. Oil shipments at periodic arrivals throughout the year are in super tankers drawing up to 35 feet.

Coastwise trade was in seasonal arrivals of coal and oil in vessels drawing up to 30 feet. The shipment of cable from Newington is of major importance.

The harbor, of sufficient depth to accomodate large deep-draft ships, is open throughout the year, though

they are hampered somewhat in passing through the two lift bridges over the main channel to deep water berths above the city.

New Castle (P.O.), a village on the south side of the harbor and the northern part of **New Castle Island,** is reached from Portsmouth by a highway connecting the islands on the south side of the harbor. The island is of considerable importance as a summer resort. Portsmouth Yacht Club is on the north side of the island, and Coast Guard, Army, and Marine Corps installations are along the east side.

Gerrish Island, forming the east side of the harbor entrance, has many summer homes. A park and government reservation, with conspicuous buildings, are on the southwestern end. The old observation towers on the south and eastern sides of the islands are most conspicuous. A long pier with a shed on the outer end extends from the southwestern end.

Kittery (P.O.), is a town on the north bank of Piscataqua River opposite Portsmouth. South of the town are landings for small craft and several wharves with depths of 8 to 9 feet which are no longer used commercially except for some fishing. A town wharf and float landing is about 125 yards westward of the westernmost bridge to Seavey Island.

The approach, with local knowledge, is between Badgers Island and Squash Island, on the northwest, and Seavey Island on the southeast, or for small craft, northward of Seavey Island through Back Channel, if coming from eastward. This approach is restricted by the clearance under the two fixed bridges to Seavey Island; the easterly one has a clearance of 8½ feet, and the westerly one, a combined highway and railroad bridge, has a clearance of 8½ feet. The navigation channel through the east bridge is reported to be northward of the center pier, and through the west one under the second span from the south end of the bridge.

Back Channel has several dangers and is used principally by small craft and fishermen. It is marked in the easterly half by daybeacons, markers, and buoys.

For craft approaching Portsmouth, the large hotel at the west end of New Castle Island is prominent. Other **landmarks** are: the stone building of the Naval Prison on Seavey Island; Whaleback Light; the white buildings on Wood Island; the four towers of the two Portsmouth-Kittery lift bridges; four observation towers, two on Gerrish Island, and two inshore from Pulpit Rock; a standpipe on New Castle Island; and numerous standpipes, elevated tanks, church spires, and stacks in the area, most of which are charted. The old blockhouse and parapets of **Fort McClary,** on Kittery Point, just westward of the entrance channel range light, are also conspicuous.

Whaleback Light (43°03.5′ N., 70°41.8′ W.), 59 feet above the water and visible 13 miles, is shown from a gray conical tower, 75 feet high, connected to a red fog signal tower on **Whaleback Reef** at the northeast side of the outer entrance.

Portsmouth Harbor Channel Lighted Range on Kittery Point leads into the harbor on the bearing **352°45′.**

Portsmouth Harbor (New Castle) Light (43°04.2′ N., 70°42.5′ W.), 52 feet above the water and visible 13 miles, is shown from a white conical tower, 48 feet high, with fog signal house attached, on **Fort Point,** the northeast end of New Castle Island.

See Appendix for **storm warning** displays.

A Coast Guard Station and lookout tower are on Fort Point.

Pierces Island Lighted Range marks the main channel to Portsmouth on bearing **266°.**

Channels.—A Federal project provides for a channel 35 feet deep from off Henderson Point for a distance of about 6 miles to a point 900 yards above Frankfort Island in Piscataqua River.

In 1959 harbor pilots advised that at low water only 28 feet could be taken with safety to the oil and coal berths about 1 mile above the bridges, and only 24 feet to the cable wharf at Newington.

Anchorages.—The anchorage for large vessels is anywhere on the east and north sides of the channel between Wood Island, north of Whaleback Light, and Clark Island, the small island on the north side about 0.8 mile above Fort Point, in 48 to 66 feet.

Strangers should not go above Kitts Rocks in deep draft vessels without a pilot. Due to the strong currents and eddies in the bend around Fort Point, it is difficult for any large vessel to make the swing without the assistance of a tug. It is therefore not advisable to proceed above Wood Island without a tug and pilot. Most large vessels awaiting tug and pilot, or favorable mooring or docking conditions, anchor temporarily between Gunboat Shoal and the lighted whistle buoy south of Kitts Rocks.

With a southerly wind, the best anchorage is above Fort Point on the south side of the channel in 48 to 60 feet, bottom generally clay. There is swinging room there for only one medium-sized vessel without encroaching on the channel ranges, but larger vessels should anchor northward of Pierces Island range line. There is no room to anchor in the channel above Clark Island.

Yachts and smaller vessels usually anchor in Pepperrell Cove, or northward of New Castle Island, southward of the range line.

A special small-vessel anchorage is off the north side of New Castle Island; limits and regulations are given in **§ 202.1** and **§ 202.10,** Chapter 2.

Dangers.—**Gunboat Shoal,** a rocky shoal with a least depth of 19 feet, on the west side of the entrance, about 2.2 miles southward of Whaleback Light, is marked on its northeast end by a bell buoy. An area of rocks and ledges, some of which dry at low water, extends about 1.5 miles eastward of Whaleback Light and up to 0.6 mile from shore. They include: **West Sister** which bares 3 feet and marked by a buoy off its southeast end; **East Sister,** an unmarked drying ledge about 0.5 mile northeastward of West Sister; **Phillips Rock,** unmarked, with a least depth of 3 feet about 0.2 mile southwestward of West Sister; **Horn Island** surrounded by a drying reef; and **White Island** and **White Island Reef,** southeastward of which are a number of unmarked sunken and drying rocks, and rocks awash.

Kitts Rocks, with a least depth of 11 feet, are on the

east side of the channel, about 0.4 mile southward of Whaleback Light and are marked by a lighted whistle buoy to the southward. **Wood Island Ledge,** extending 0.2 mile off Wood Island, is marked off its southwest end by a lighted buoy. **Stielman Rocks,** on the west side of the entrance, have a least depth of 2 feet, about 500 yards southward of Fort Point Light, and are marked by a daybeacon on the rocks and a buoy on the northeast end. **Cod Rock,** with 18 feet over it and marked by a buoy off its northeast side, is 325 yards northwestward of Fort Point Light. The remaining dangers in the harbor are described in geographic sequence.

The broken ground off the entrance to Portsmouth Harbor, and the main channel in the harbor as far as Clark Island, have been examined by means of wire drag. The outer limit of the dragged area off the entrance is about 1.5 miles eastward of Boon Island Ledge lighted whistle buoy and 4 miles eastward of the Isles of Shoals.

This area is a part of the dragged section extending from a point about 6.5 miles southwestward of Isles of Shoals northward to Cape Elizabeth. The dangers close along the shore were not covered by wire drag.

Bridges.—The principal bridges in Portsmouth Harbor are the two lift bridges between Portsmouth and Kittery. The easterly one is a highway bridge from Portsmouth to Badgers Island with a clearance of 19 feet. The highway continues over a fixed bridge from the island to Kittery. It has a clearance of 11 feet.

The westerly lift bridge, a combined highway and railroad bridge, from Nobles Island to Kittery, has a clearance of 10 feet.

Operating regulations for the two lift bridges are given in **§ 203.35,** Chapter 2.

All other bridges in the harbor are described in geographical sequence.

Tides and currents.—The mean range of the tide is 7.8 feet at Portsmouth and 6.4 feet at Dover Point. The tidal currents are strong and special care is required. The predicted times of slack water and the times and velocities of strength of flood and ebb at Portsmouth Harbor entrance, off Wood Island, are given in the Tidal Current Tables. Similar predictions for a number of other locations in Portsmouth Harbor may be obtained through differences and ratios contained in Table 2 of the Tidal Current Tables.

Pilotage into Portsmouth Harbor is compulsory for all vessels engaged in foreign trade, but not for vessels under coastwise enrollment or license. There are two pilots available who are licensed for Portsmouth Harbor and Piscataqua River. They are also the captains of two of the harbor tugs.

As all commercial wharves, except fish piers, now in use, are above the lift bridges, all large vessels, including coastal colliers, take a pilot and tug from the outer anchorage.

The strong currents in the narrow channel make the approach to and passage through the bridge very difficult. The largest vessels usually require two tugs and are taken through at or near high water slack.

A pilot to the outer anchorage is not necessary in clear weather when the aids are seen but strangers should not go beyond Kitts Rocks at any time. In fog or low visibility no vessel of any size should proceed northward of Wood Island.

The larger vessels awaiting a pilot or tide usually anchor between the lighted whistle buoy south of Kitts Rocks and Gunboat Shoal. Vessels desiring a pilot should radio or telegraph the Portsmouth Navigation Company.

Towboats.—In the harbor there are three modern fully equipped tugs which also act as fireboats. They are all equipped with ship-to-shore voice radio and can be contacted direct on 2182 kc. Naval and other vessels docking at Seavey Island usually require a tug.

Quarantine.—There is no quarantine station. Vessels subject to quarantine will be inspected by officials of the U.S. Public Health Service at Boston.

Customs.—Portsmouth is a port of entry and marine documents are issued.

Immigration.—The local customs officers handle immigration matters pertaining to alien seamen; other immigration matters are handled by the Boston Immigra-
May 1 to October 1.

Harbormaster.—The harbormaster can be contacted through the local police or at the yacht club near Salamander Point on New Castle Island.

Supplies.—Coal, gasoline, provisions, and a limited quantity of chandlery stores are obtainable at Portsmouth. Water of good quality but high in lime and magnesia may be obtained from towboats or alongside the wharves. Fuel oil can be obtained by prior arrangement.

Repairs.—There are no facilities for drydocking commercial vessels in Portsmouth Harbor. The nearest for large vessels is at Boston. Several machine shops can make minor repairs to machinery. The several boatyards are capable of hauling out boats up to 60 feet in length and 6 feet in draft.

Little Harbor is on the west side of the entrance to Portsmouth Harbor 0.8 mile westward of Whaleback Light. Vessels should not attempt to enter in bad southeasterly weather when the sea breaks across the entrance. The entrance is between two breakwaters, the northern of which is marked by **Jaffrey Point Light (43°03.3′ N., 70°42.8′ W.),** 22 feet above the water and shown from a red post on the outer end; the light is operative from
tion Office.

Two buoys mark the entrance outside the breakwaters. Inside the breakwaters, an anchorage basin has a controlling depth of about 6 feet. It is marked by buoys on its north side. A limited anchorage only for very small craft is in the channel above the inner buoy.

A highway bridge across Little Harbor has a bascule span, manually operated, with a clearance of 12 feet. Operating regulations are given in **§ 203.48,** Chapter 2.

The Wentworth (P.O.), is a large and conspicuous white hotel on the north side of the harbor. The hotel maintains a wharf and float landing near the bridge.

A narrow thorofare, bare in several places at low water, connects the northwestern end of Little Harbor with Portsmouth Harbor. There are a number of private float

landings on the thorofare. Between Marvin (Shapleigh) Island and Goat Island a fixed highway bridge with a clearance of 14 feet crosses the thorofare.

About 0.2 mile westward another part of the thorofare passes westward of **Marvin (Shapleigh) Island** and **Pierces Island.** Two fixed highway bridges cross it. One from Marvin Island to **Frame Point** has a clearance of 10 feet, and the other from Pierces Island to the Portsmouth mainland has a clearance of 16 feet. Several fish wharves on the Portsmouth side of the cut, close southward of the Pierces Island bridge, have float landings with gasoline piped to them.

Sagamore Creek which empties into Little Harbor from the westward is navigable for about 1.6 miles above its mouth, but is extremely narrow and shoal in places. There is considerable small craft activity on the creek and in 1959 the channel was marked by stakes.

About 0.5 mile above the mouth there is a marina and boatyard. There is a depth of 4 feet at its float landing and gasoline is piped to it. The yard has a 20-ton travel lift, a hard-surfaced ramp and storage facilities. Ice, provisions, and supplies can be obtained. Party fishing boats operate from a restaurant and pier close eastward.

A fixed highway bridge crossing the creek about 1 mile above the mouth, with a clearance of 7 feet, has a center pier about midchannel. There are a number of private landings on the creek.

Pepperrell Cove is on the eastern side of the harbor, northeastward of Portsmouth Harbor Light, and on the north side of Fishing Island, which is grassy. The cove is subject to shoaling and has depths of about 8 to 9 feet. It is mainly used by fishing vessels, yachts, and small craft. A buoy northwestward of Fishing Island marks the entrance to the cove.

Kittery Point (P.O.), a village on the north side of the cove, has a public wharf and float landing with 8 feet alongside. Gasoline, diesel oil, and fresh water are piped to the float, and ice, provisions, yacht and marine supplies, and ship chandlery are available at a market at the pier. A hard-surfaced ramp is alongside the pier. The Pepperrell Cove Yacht Club and Kittery Point Boat Club are also at the pier.

Moorings in the cove are under the supervision of the **harbormaster** who can be found at the landing or contacted through the yacht club, market, or local police.

Chauncey Creek, with its entrance between **Gooseberry Island** and Kittery Point, extends about 1.2 miles eastward between Gerrish Island and the mainland. There is considerable small craft activity in the creek which dries in its upper half. Gasoline, water, provisions, and seafood can be obtained at a float landing about halfway up the creek on the north bank.

Spruce Creek empties into the north side of Portsmouth Harbor at the eastern end of Back Channel and **Hick Rocks,** a drying ledge marked by a daybeacon. The creek has a narrow unmarked channel with a least depth of 12 feet for about 1.2 miles above the entrance, and lesser depths shoaling gradually to 1 foot or less, to a point about 0.8 mile farther upstream. The creek dries out about 0.2 mile below a dam at the fixed highway bridge of the main coastal highway, U.S. Route No. 1. Extensive mud flats border the channel for most of its length.

Just above the entrance a fixed highway bridge, with a clearance of 6½ feet, crosses the creek and joins Kittery Point with Kittery. About 0.2 mile above this bridge, the remains of an old railway trestle crosses the creek; some of the trestle and its piling have been removed in way of the channel. There are private landings but no services on the creek.

Small craft facilities in Portsmouth Harbor.—Portsmouth Yacht Club is on the north side of New Castle Island close westward of Salamander Point. There is a depth of 8 to 9 feet at its float landing to which gasoline, diesel oil, and fresh water are piped. Guest moorings are maintained by the club and other moorings in the special small-vessel anchorage are available for hire.

A boatyard in the cove westward of the club has a marine railway that can haul out craft up to 30 feet in length for repairs or winter storage. The harbormaster for Portsmouth and New Castle can be reached at the yard.

There is a boat repair, storage, and building yard in Kittery at the eastern end of Back Channel northeastward of **Jamaica Island.** Its marine railway can haul out craft up to 60 feet in length. Fresh water, ice, provisions, and most supplies can be obtained. Another yard is on the southwestern end of Badgers Island. Gasoline and fresh water are piped to its 100-foot pier, which has 11 feet of water alongside. The marine railway can haul out craft up to 45 feet in length for repairs or storage. The yard maintains guest moorings and permits overnight berthing. Ice, provisions, and most supplies can be obtained.

Chart 212.—The Piscataqua River, above Portsmouth, forms the approach to Salmon Falls, Cocheco, Bellamy, Oyster, Lamprey, and Squamscott Rivers. It is also the approach to the towns of Newington, Durham, Newmarket, Exeter, and the city of Dover, all served by rail.

The river has ample depth for large vessels for about 3.5 miles above the upper lift bridge, at Portsmouth, which carries the Maine Turnpike and the railroad across the river, to its confluence with its western branch at the fork at Dover Point. Most of the dangers in this section of the river are marked except Boiling Rock, off the east bank, about 1.1 miles above the bridge.

The main river continues northward for 3.5 miles to the confluence of the Salmon Falls and Cocheco Rivers, both of which are described later.

Buoyage.—The Piscataqua River is buoyed to a point about 2 miles above Dover Point and its western branch in Little Bay for about 4.6 miles above Dover Point to a point in Great Bay about 1 mile above Furber Strait. The western branch, Little and Great Bays, and their tributaries are also described later in the text.

The channels in all the tributary rivers are narrow, crooked, shoal at the heads, and as they are unmarked, local knowledge is necessary to navigate them.

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Some of the buoys in the river are reported to tow under sometimes in the strong currents, and, in particular, the buoy about 0.3 mile northeastward of Dover Point which marks an extensive shoal extending from the east bank. A number of wooden pile dolphins marking the southern and western edge of this shoal are reported to be covered at high water and dangerous to small craft.

Currents.—General navigation throughout the entire length of the Piscataqua River system is severly hampered by rapid tidal currents. The velocities of these currents differ at various locations because of the irregularities in the width and depth of the river and its tributaries.

The maximum average velocity in the river occurs immediately north of Nobles Island and amounts to 4 knots.

The irregularities of width and depth plus the abrupt directional changes of course result in changes in the direction of the currents which at some locations do not coincide with the direction of the channel, and create hazardous cross currents.

As a result of the combination of rapid tidal currents and hazardous cross-currents, navigation of deep-draft vessels is limited to the 3-hour period consisting of 1.5 hours before and 1.5 hours after slack water during daylight hours.

In 1959, the harbor pilots reported that deep-draft vessels were usually taken up through the two lift bridges with the aid of two tugs to the powerplant and coal and oil berths opposite Boiling Rock at or near high water slack.

Large cable ships are also taken up to the Simplex Wire and Cable Company pier at Newington about 1.7 miles above the upper lift bridge.

Current predictions for a number of locations in the river may be obtained from the Tidal Current Tables.

Pilots and tugs can be obtained at Portsmouth. Traffic above Dover Point is confined to yachts, fishermen, and other small craft.

On **Freemans Point**, on the west bank about 200 yards above the upper lift bridge. the gypsum wharf has a depth of 19 feet alongside. Vessels drawing from 14 to 17 feet dock every week at this wharf during the summer.

Spinney Creek, about 0.5 mile above the upper lift bridge, is crossed by a causeway dam, with culvert, about 300 yards above its entrance. The cove thus formed, marked on the south side of the entrance by a lighted buoy, is a snug haven for small craft out of the strong currents of the river.

There are several private float landings on the southeastern side of the cove and a service pier and float landing on the northwest side. Gasoline and fresh water are piped to the float which has 12 feet alongside. Ice, provisions, and some supplies can be obtained at the facility. There is good anchorage in the cove in up to 25 feet, soft mud bottom.

Boiling Rock, a dangerous ledge which is reported to extend some distance underwater into the channel, about 0.6 mile northwestward of Spinney Creek, is unmarked. However, there is a light on the point about 150 yards southeastward of the rock.

In the cove across the river from Boiling Rock, the large floating power plant SS RESISTANCE is moored to crib dolphins.

Overhead power cables crossing the river at this point have a minimum permit clearance of 145 feet.

Just upstream from the floating powerhouse are two wharves. The lower one, the power company and oil wharf, has a 600-foot berth with 35 feet alongside; the upper one, the coal wharf, has a 700-foot berth with 37 feet alongside. Boiler and potable water are available at both wharves.

Caution.—The wharves and floating powerplant are along the outer shore of the river's bend, toward which strong currents sweep, and are only about 500 feet from Boiling Rock. The restricted channel is further reduced about 100 feet when the large supertankers drawing up to 35 feet, and large colliers drawing 29 feet or better, are at these wharves.

Vessels transiting the area must steer a course near the wharves to provide safe clearance from Boiling Rock and to have proper maneuvering area in order to make the turn. However, operations around the wharves restrict such a course, making navigation difficult.

All vessels except the smaller tankers usually have the assistance of two tugs when maneuvering in the area. All vessels should exercise caution and pass this area with very little headway to avoid interference with or damage to the moored vessels or installations when unloading operations are in progress.

About 0.5 mile upstream from the coal wharf the Simplex Wire and Cable Company has a cable loading wharf with mooring dolphins. The approach and alongside the wharf has been dredged to 30 feet. However, the harbor pilots advise that no more than 24 feet can be carried with safety at low water above the coal wharf to the cable wharf.

Small coastal tankers carry 15 or 16 feet to an oil berth on the west bank about 1.2 miles above the cable wharf.

The elevated tanks at the cable and gypsum plants, the coal transporter on the coal wharf, the oil storage tanks, the transmission towers, and the General Sullivan Bridge are conspicuous on this section of the river.

From **Dover Point** the river extends 3.5 miles to the confluence of the Salmon Falls and Cocheco Rivers.

On the east side of Dover Point, **Hilton State Park** has a pier, float landing, wooden surfaced ramp for launching small craft from trailers, special parking facilities for cars and boat trailers, picnic areas, snack bar, bathhouses, restrooms, and a swimming beach. Water is piped to the float, and restaurants, lodging, and telephones are nearby.

About 0.7 mile northward of Dover Point, on the west bank, there is a boatyard with marine railway, which can haul out craft up to 45 feet in length for hull and engine repairs, or dry, open or covered winter storage. The yard has numerous moorings and 10 berths at floats which dry at low water. Gasoline is available at the

floats and provisions can be obtained a short distance away.

About 0.4 mile northward, on the west bank, there is another boatyard with a marine railway that can haul out craft up to 40 feet in length for hull repairs, or dry, open and covered winter storage. This yard also builds sail craft up to 40 feet in length. There is no gasoline or other service available at the yard.

Sturgeon Creek on the east bank about 2 miles north of Dover Point, dries out pretty well at low water and is foul, but in May 1959, some small craft were observed to be moored in the narrow crooked channel. There are some private landings on the creek but no service facilities. A fixed bridge crosses the creek about 0.5 mile from the entrance.

The river is buoyed from Dover Point to about 0.4 mile above Sturgeon Creek, and has a fairly deep and clear channel about midriver. Above that point the river is unmarked and shoals gradually.

About 1 mile north of Sturgeon Creek, overhead power cables crossing Piscataqua River have a minimum permit clearance of 65 feet.

About 3.5 miles above Dover Point the Piscataqua River divides at a confluence known locally as **Three Rivers**, the north fork continuing northward as Salmon River, and the northwest fork as Cocheco River.

Salmon Falls River is said to be navigable for small craft for about 3 miles to just below South Berwick, Maine. The channel is narrow, crooked, and unmarked. About 0.7 mile above its mouth, it is crossed by a fixed highway bridge with a clearance of 5 feet. In May 1959, no small craft activity was observed on the river.

Cocheco River is reported to have shoaled to a depth of 0.5 foot at a point close eastward of **Fresh Creek**, and about 0.7 mile above the mouth. The river has a crooked unmarked channel to the head of navigation at a dam in the city of **Dover** (P.O.), about 10 miles above Portsmouth.

There is no commercial water traffic on the river but there is some small-craft activity. There are no service facilities. Local knowledge is necessary to pass up the river through the **Lower and Upper Narrows.**

A number of overhead power cables cross the river, five sets in all, the minimum permit clearance of which is 34 feet.

The western branch of Piscataqua River is crossed at **Dover Point** by General Sullivan Bridge, a fixed highway bridge, having a clearance of 46 feet for a middle width of 100 feet.

The lower section of the western branch of Piscataqua River is known as **Little Bay**, which extends about 1.7 miles westward from its confluence with the main river, as far as **Fox Point.** It then trends southward to a junction, at **Furber Strait** with **Great Bay**, the upper section of the western branch, about 3.5 miles above General Sullivan Bridge.

Little Bay is deep and generally clear in the middle as far as **Goat Island**, but there are several unmarked shoal spots up to that point, and the edges are shoal with drying flats extending 200 to 300 yards offshore in places.

On the east side of the entrance to **Broad Cove**, about 0.3 mile above the General Sullivan Bridge, there is a large marina with piers, floats and slips to accommodate up to 50 craft of all sizes. There is a depth of from 5 to 10 feet at the berths which are protected from the northwestward by a stone breakwater. Gasoline is piped to the wharf, and water and electricity are available at the floats.

A 20-ton travel lift can haul out craft up to 55 feet in length and 18-foot beam, for hull and engine repairs or dry, open or covered winter storage. Ice, provisions, yacht and marine supplies, ship chandlery, and all services are obtainable at the marina. Telephone and snack bar are on the wharf.

Most of the important dangers in Little and Great Bays are marked and a buoyed channel can be followed from the mouth to a point in Great Bay about 1 mile above Furber Strait.

Bellamy River, flowing into Little Bay from northward, has a reported depth of less than 4 feet in a narrow, crooked, and unmarked channel for about 1.4 miles above the bascule highway bridge across the mouth. The bridge has a clearance of 9 feet; operating regulations are given in **§ 203.40**, Chapter 2.

Local knowledge is essential to keep in the narrow unmarked channel, which is seldom used except by small craft. An overhead power cable crosses the river about 2.4 miles above the bridge with a minimum permit clearance of 52 feet.

Oyster River, which flows into Little Bay westward of Fox Point, has a narrow, crooked, and unmarked channel, bare in places at low water, to the village of Durham, 8.2 miles above Portsmouth.

Durham (P.O.), the site of the University of New Hampshire, has many historical colonial connections. Local small craft activity was noted in the river in 1959 and there are several private landings but no service facilities. Local knowledge of the river is essential to its passage.

Great Bay, a large expanse, mostly of mud flats, about 2 miles long and 3 miles wide, is the upper section of the western branch of the Piscataqua River. Into it flow the Lamprey and Squamscott Rivers. There is a deep buoyed channel in the middle of the bay for about 1.2 miles above Furber Strait.

From that point a crooked, unmarked, and somewhat foul channel leads to the mouths of the two rivers. Some small craft activity was noted about the shores of the bay in 1959 but there were no service facilities.

Lamprey River has a depth of about 4 feet in a narrow, crooked, and unmarked channel to the village of **Newmarket** (P.O.), 12 miles above Portsmouth. Local motorboats navigate the river and local knowledge is essential to it passage. Much of the river is reported to dry at low water but there is always a narrow channel in which small craft can and do get through.

There is a private landing at the head of navigation in a cove eastward of the dam and mill which straddle the river at the village. There are no service facilities on the waterfront, but gas, provisions, and other essentials may be obtained in the village.

There is room and depth for small craft to anchor off the mill wharf, which in May 1959 was in disuse and in poor condition.

An overhead power cable crossing the river at the Lower Narrows has a minimum permit clearance of 54 feet.

Squamscott (Exeter) River which flows into the western end of the head of Great Bay, has a depth of about 4 feet to **Oxbow Cut.** From there to the town of Exeter about 16.5 miles above Portsmouth, the channel is reported to dry in places. Local knowledge is advisable to navigate the river to the head of navigation at the dam at Exeter.

Exeter (P.O.) is the site of Phillips Exeter Academy and is a beautiful town of antiquity and colonial historical importance. The buildings of the academy and public buildings of the town are beautiful and impressive. There is a public landing at the town but the only small craft activity observed at the town in May 1959 was the boating of the academy.

Three bridges cross the river. The first, a fixed railroad bridge at the mouth, has a clearance of 5 feet. The second, a fixed highway bridge, has a clearance of 9½ feet. The third, a fixed highway bridge just below the Oxbow Cut, has a clearance of about 21 feet.

Overhead power cables crossing the river about 0.7 mile and 3 miles, respectively, above the railroad bridge have a minimum permit clearance of 50 feet. In June 1959 some fishing and pleasure craft activity was noted on the river at the second bridge where there is a gravel beach ramp suitable for launching small craft from trailers at the east end, north side of the bridge. There is a lobster pound and restaurant nearby. No other facilities were noted.

Chart 211.—From Portsmouth Harbor entrance to Rye Ledge, a distance of about 5 miles, the coast has a general southwesterly trend, with no marked indentation. It presents the appearance of a succession of sand beaches separated by ledges extending out about 0.5 mile, with occasional hotels and many summer houses back of the high-water line.

About 0.7 mile southwestward of **Odiornes Point** are two old wartime observation towers in disuse. One, a square skeleton steel tower with square house on top, is close to the beach road; and the other, a round concrete tower, is about 100 yards northwestward. They are outstanding landmarks for cruising small craft approaching Portsmouth or Little Harbors from the southward.

Seal Rocks are part of a foul area extending about 0.4 mile offshore southward of Odiornes Point. They are unmarked.

Cruising small craft approaching Little Harbor or Portsmouth from the southward, when passing inside Gunboat Shoal, should keep at least 0.7 mile offshore in order to avoid this area, before coming up to Portsmouth Harbor Channel Range.

Concord Point, about 3 miles southwestward of Whaleback Light, may be identified by a large hotel building with cupola. **Foss Ledges,** partly bare at low water, extend 0.5 mile offshore from the point and are marked by a buoy at the outer end.

Rye Harbor, 4.2 miles southwestward of Whaleback Light, is a small cove used by pleasure and fishing boats. A stone breakwater is built southward from **Ragged Neck Point,** and another breakwater extends northeastward from the point at the south side of the entrance to Rye Harbor. These breakwaters are about 6 feet above high water.

The channel at the entrance between the breakwaters is about 100 yards wide and has a depth of 7 feet, except for a reported rock covered by 2 feet about 100 yards southward of the south end of the north breakwater.

The **anchorage** in the cove has 4 to 6 feet. Local craft favor the northern breakwater slightly when passing through the entrance.

The pier and float landing with 4 feet alongside is on the south side of the harbor. Gasoline is piped to the float and water is obtainable in limited amounts. A store with snack bar at the harbor is open in summer. Limited supplies are obtainable there. A lobster pound and restaurant are on the coastal road close southward off the harbor.

Local information is advisable in seeking an anchorage, or a mooring, which usually can be obtained from the **harbormaster.** The harbor is small and congested, but safe. It is not safe to attempt to enter during heavy easterly weather.

Straw Point, 0.5 mile south of Rye Harbor, is marked by a prominent white flagpole. **Rye Ledge** is 1.2 miles southward of Straw Point. The ledge is partly bare at high water, extends 0.4 mile from shore, and is unmarked. The buildings and towers of a government installation on shore northwestward of the ledge and a large summer hotel close southward of the installation are very conspicuous.

Isles of Shoals consist of a group of islets 5 to 6 miles offshore southeastward of Portsmouth Harbor entrance. Seven islets, several rocks, and ledges comprise the group which extends about 3 miles in length in a northeasterly direction, and is marked at the southwest end by Isles of Shoals Light.

Several channels between the islands are used only by local fishermen and yachtsmen who occasionally seek shelter from easterly winds. Isles of Shoals are frequented mostly by summer visitors, a few fishermen, and Coast Guard personnel. In the summer of 1959 a small vessel was making daily trips from Portsmouth to the Isles of Shoals. Hotel accommodations are available during the season.

On a clear day the Isles of Shoals can be seen for 10 miles. The houses and a tower on Appledore Island are the most prominent. Vessels passing westward can avoid all dangers by giving the islands a berth of 0.5 mile; vessels passing eastward should take care to avoid Cedar Island and Anderson Ledges; giving the islands a berth of 1.5 miles leads well clear of these two ledges.

Isles of Shoals Light covers the entire horizon, but is blanked out by houses on the islands northward for vessels approaching from that direction.

Isles of Shoals Light (42°58.0′ N., 70°37.4′ W.), 82 feet above the water and visible 15 miles is shown from a white conical tower, 58 feet high, with a covered way extending nearly to a dwelling on **White Island**, the southernmost island of the group; a fog signal is at the light. Ledges covered at low water extend 0.2 mile southwestward and westward from the island.

Duck Island, the northernmost of the group, is low, rocky, and surrounded by ledges, and should be given a berth of 0.5 mile.

A **danger zone** for a Navy bombing target area has its center on **Shag Rock** off Duck Island; limits and regulations are given in § **204.2**, Chapter 2.

Mingo Rock is the southernmost of the reefs making off from Duck Island and 550 yards southeast of it is **Old Henry**, a 28-foot spot, which breaks in heavy weather.

Appledore Island, the largest of the group, is about 1 mile southwestward of Duck Island. It is high and has a few cottages and a very tall tower near the middle of the island. The channel between Duck and Appledore Islands has depths of 27 to 90 feet, irregular bottom. A small 7-foot spot northwestward of the island is marked by a buoy.

Smuttynose Island is southeastward of Appledore Island, with a narrow channel between them having a depth of 20 feet. There is a house near the western end of this island, and there is a small cove, **Haley Cove**, where boats lie aground at low water.

Cedar Island is connected with Smuttynose and Star Islands by breakwaters. Westward of Cedar Island and the breakwaters is Gosport Harbor, a small anchorage used by fishermen and others during easterly winds.

Gosport Harbor is well protected except from westerly winds and is considerably used as an anchorage by local fishermen and sometimes by small coasting vessels and yachts. A bell buoy is off the entrance to this harbor.

Star Island, westward of Cedar Island, has on its northern side the village of **Gosport** consisting of a hotel, several houses, a small church, and a steamboat landing with a depth of about 18 feet. A 40-foot obelisk memorial is about midway of the island on the western side.

Lunging Island is a low, bare, rocky islet surrounded by ledges. It is 0.3 mile westward of Star Island. The channel between these islands is obstructed by **Halfway Rocks**, marked by a buoy, and also by a 6-foot shoal.

Cedar Island Ledge, bare at half tide and 0.4 mile southeastward from Cedar Island, is about 300 yards in length, east and west.

Anderson Ledge, bare at half tide and marked by a daybeacon, is 1 mile east-southeastward of Isles of Shoals Light and is the farthest outlying danger. The ledge is about 200 yards in diameter and has good water around it.

Chart 1206.—From **Fox Hill Point** to Merrimack River Entrance, there are about 9 miles of sandy beaches, several rocky headlands, and offlying reefs and ledges up to 1 mile from shore. Summer resorts line the beaches, and hotels and prominent summer homes are on the headlands. Salt marshes, between the beaches and the coastal ridge about 2 to 2.5 miles westward, are drained by small rivers, most of which flow into the inlet at Hampton Harbor.

Little Boars Head is a yellow bluff 7 miles southwestward of Whaleback Light. A summer resort of the same name extends over 0.5 miles northeastward from the bluff; a large green-roofed mansion on the head is conspicuous. A ledge, which bares 1 foot at low water, is about 0.4 mile from the head. A buoy, about 1 mile east-southeastward of the head, marks the ledge and the broken and foul ground off it.

The cupola, buildings and signal tower of the Hampton Beach Coast Guard station are conspicuous about 1 mile south-southwestward of Little Boar Head.

Great Boars Head is a bluff point making out 0.3 mile between North Beach and Hampton Beach, and 9.5 miles southwestward of Whaleback Light. Standing on Great Boars Head is a prominent tall standpipe which is the most conspicuous mark on this section of the coast. The summer resort of **Hampton Beach** (P.O.) extends northward and southward from the point.

Hampton Harbor, about 10 miles southwestward of Portsmouth Harbor, and 1.5 miles from Great Boars Head, is an inlet formed by the confluence of **Hampton** and **Blackwater Rivers**, and other rivers, sloughs, and creeks which drain the extensive area of salt marsh to the westward of Hampton, Seabrook, and Salisbury Beaches.

The harbor is principally an anchorage for numerous pleasure craft and a considerable number of party and charter hire fishing boats which operate from the harbor from late spring to early fall. There is also some year-round fishing activity.

The most prominent landmarks approaching the harbor are the standpipe on Great Boars Head, the pavilion and bath houses of Hampton Beach State Park, on the north side of the entrance, the operating tower of the bridge crossing the inlet, and the numerous buildings along the beaches north and south of the entrance.

The **anchorage** in the harbor is confined to the narrow channels of Hampton, Blackwater, and other rivers and creeks, and ranges in depths from 2 to 18 feet, the best water being available just northward of the inlet off the service wharf and new marina.

The entrance to the inlet is between two rock jetties, each marked on the outer end by a daybeacon. A bascule highway bridge, with a clearance of 19 feet, crosses the inner end of the inlet; operating regulations are given in § **203.50**, Chapter 2. It is reported that the flood velocity under the bridge is from 1.5 to 2.2 knots and the ebb velocity from 2 to 3.2 knots.

Extensive rocky ledges obstruct the approaches to the entrance to the inlet. **Hampton Shoal Ledge**, with a least depth of 19 feet, about 2.8 miles eastward of the entrance, is unmarked.

About 0.5 mile off the entrance is an extensive area of drying and sunken rocky ledges consisting of **Old Cellar Rock, Inner** and **Outer Sunk Rocks**, and **Channel, Town,** and **White Rocks.** A buoyed approach channel leads

roughly through the center of the area. A lighted bell buoy marks the approach to the channel.

A bar across the entrance has a reported least depth of 4 feet. The buoys marking the channel through the bar are subject to frequent changes due to the shifting nature of the bar.

In August 1959 it was reported that the party fishing craft operating from the harbor, drawing 5 feet or more, seldom experience any difficulty in entering or leaving at any time except on the lowest tides, or on the ebb with an easterly wind when a considerable chop is kicked up.

The use of local knowledge is recommended in navigating the approach channel. Party fishing craft crossing or lying off the entrance can usually be consulted to obtain the latest information on bar conditions. For craft entering or leaving, the chart should be the guide, and by following the aids with due attention to existing conditions little difficulty should be experienced.

In heavy weather the harbor is closed due to heavy breakers across the entrance.

Several party fishing boats operate from the float landing of the state park inside the harbor close northward of the bridge. A service landing is close to the northwestward of the park float. Gasoline and fresh water are piped to it and there is a restaurant with restrooms on the pier. Ice, bait, tackle, food, yacht supplies, hardware, and most essentials can be obtained. Party and charter hire fishing boats operate from the float, and rowboats and outboards are for hire. Dry, open and covered winter storage is available. In August 1959, a marina was under construction at the facility.

Showers and restrooms are available at the State Park across the road. Motels, restaurants, lodging, markets, and other conveniences are available at the village of Hampton Beach.

Telephone and telegraph communications and bus service are available.

There is a state wharf with 2 feet alongside at Seabrook at the southern end of the harbor from which a number of party and charter hire fishing boats operate. A snack bar and refreshments are available at the wharf and a restaurant nearby. A narrow dredged channel leads southward to it from the inlet. Numerous small craft are usually found moored in the channel.

From Hampton Harbor, **Seabrook Beach** and **Salisbury Beach** extend 4.3 miles in a southerly direction to the entrance of Merrimack River. Ledges, and foul and broken ground extend up to 0.8 mile offshore and among them a number of rocks awash, including **Thomas Rock** and **Round Rock**, are unmarked. **Breaking Rocks**, a ledge with a depth of 3 feet over it, is 0.7 mile offshore and nearly 2 miles south of Hampton River. It is marked at its northeast end by a buoy.

The amusement park with its roller coaster at Salisbury Beach is most conspicuous. The large bathing pavilion and bathhouses of Salisbury Beach State Park near the southern end of the beach are very conspicuous.

Chart 213.—Merrimack River is the largest and most important river in the eastern part of Massachusetts. It is the approach by water to the cities of Newburyport and Haverhill, and the towns of Amesbury, Merrimacport, Groveland, and Bradford, and is used by vessels of 6-foot draft at high water up to Haverhill and about 12-foot draft at high water to Newburyport The head of all navigation is the dam at Broadway in Lawrence, 25.7 miles above the mouth.

The river is seldom entered for refuge, and there was no commercial traffic on the river in 1959. The river is charted to a point about 2.7 miles above the bridges at Newburyport.

The entrance is obstructed by a shifting bar, with 4 to 15 feet over it, and depending on conditions, the bar is dangerous to cross in heavy weather. U.S. Coast Guard vessels with drafts of 12 feet cross the bar at high water. The whole entrance breaks in easterly gales. It is marked by a lighted whistle buoy about 1 mile off the entrance.

Newburyport Harbor Light (42°48.9′ N., 70°49.1′ W.), 50 feet above the water and visible 12 miles, is exhibited from a white conical tower, 35 feet high, near the western end of **Plum Island Point**, the southern point of the entrance. The light is obscured in several sectors by shore structures.

Merrimack River Entrance Leading Light (42°49.4′ N., 70°49.3′ W.), 56 feet above the water on a skeleton tower with a white daymark, on the north side of the entrance, shows on a 3° sector covering the channel through the bar. It has a red sector of 12° covering the shoal and foul ground southwestward of the entrance channel. It is obscured elsewhere.

A bell buoy and three other buoys mark the ends of the jetties and the limits of the bar channel, and a lighted buoy is at the inner end of entrance channel at the sharp turn in the river. Lighted and unlighted aids and a lighted range mark the channel to Newburyport.

Jetties with an opening 1,000 feet wide between the ends extend from both points at the entrance out to the bar. The jetties are partly submerged and difficult to see at high water, particularly at night and in periods of low visibility.

Newburyport is a city on the south bank of the river 3 miles above the entrance. It had no trade by water in 1959, except some fishing.

In the approach to the entrance of Merrimack River, the most important objects are: the cottages on the south side at the entrance; the large hotels and roller coaster at **Cushing**, 1.5 miles north of the entrance; and the large bathing pavilion and bath houses of the state park near the southern end of Salisbury Beach, just north of the entrance. A large water tank, standpipe, yellow brick stack, the bridges, church spires, several stacks, and a cupola, all in Newburyport are conspicuous.

The towers of the overhead power cables crossing the river which have a permit clearance of 105 feet, are very conspicuous, as well as the powerhouse on

the south bank at the eastern end of Newburyport. The Coast Guard lookout station and steel signal tower near the inner end of the south jetty are also conspicuous.

Channels.—A Federal project provides for a channel 12 feet deep through the bar; thence 9 feet deep to a turning basin off the wharves at Newburyport.

In August 1958, the controlling depth across the bar was 12 feet, and thence, in January 1958, 10 feet to Newburyport and in the turning basin. In June 1959 some shoaling was reported in the bar channel.

From Newburyport to Haverhill, about 18 miles above the entrance, the river has been improved by dredging a channel 150 feet wide and 7 feet deep. In 1956 the controlling depth to Haverhill was reported to be 6 feet.

Anchorages.—At Newburyport the usual and best anchorage is in the channel about 400 yards below the highway bridge favoring the north side of the channel and keeping clear of the two charted cable areas. The current is reported to run strongest along the south shore here. The holding ground is good.

A special small-vessel anchorage is in the river eastward of the American Yacht Club and southward of **Half Tide Rocks**; limits and regulations are given in **§ 202.1** and **§ 202.15,** Chapter 2.

The yacht club maintains guest moorings as do many of the service facilities and marinas. Numerous private moorings are maintained off Newburyport and in the upper river as far as Haverhill. They are under control of the harbormasters at Newburyport, Amesbury, and Haverhill.

Bridges.—Merrimack River from the entrance to Haverhill is crossed by nine bridges, six of which are highway bridges and three railway. The highway and railway bridges at Newburyport are both swing bridges and have clearances of 13 feet in the north draw. The south draws in both bridges have shoals in them.

About 1.5 miles above the Newburyport bridges, the river is divided into a main, or north channel, and a south channel by **Eagle Island,** and **Deer Island** and the shoals west of it.

About 2 miles above Newburyport a suspension highway bridge with a clearance of 28 feet crosses the south channel from Belleville to Deer Island. This bridge was originally built in 1810 with chain suspension. The highway then crosses to **Salisbury Point** from Deer Island on a swing bridge which has a clearance of 14 feet.

About 300 yards westward of the swing bridge the New Hampshire-Massachusetts Turnpike bridge crosses the river from Salisbury Point to Belleville. Clearance over both the north and south channels is 55 feet.

At **Rocks Village** on the north bank about 7.7 miles above the Newburyport Highway Bridge a hand-operated highway swing bridge with clearance of 17 feet crosses the river to **West Newbury** (P.O.).

At **Groveland** (P.O.), about 10.7 miles above the Newburyport highway bridge, a highway bascule bridge with a clearance of 14 feet crosses the river to **Riverside** on the north bank.

At Haverhill three bridges cross the river; the lowest one, the Bradford Highway Bridge, has a double leaf bascule with a clearance of 29 feet.

The fixed railway bridge about 0.5 mile above Bradford Bridge has a clearance of 36 feet, and the fixed highway County Bridge, close above the railway bridge, has a clearance of 30 feet.

Operating regulations for the drawbridges crossing the Merrimack River are given in **§ 203.55,** Chapter 2.

At **Mitchells Falls,** about 2 miles above the County Bridge, the river becomes foul and full of rocks, virtually impassable at low water, but at high water small craft are reported to navigate the river to the dam at Lawrence.

Directions, Merrimack River.—The river for a distance of about 6 miles above the entrance is shown on chart 213. A lighted whistle buoy is about 1 mile outside the bar, a bell buoy at the bar, and the channel across the bar is marked by an entrance leading light and by buoys. The chart should be the guide following the aids. Considerable chop is experienced on the bar with the wind against the tide.

Small craft may enter when the sea is smooth and on a rising tide, following the buoys. The river cannot be entered during a heavy sea. The outer ends of the jetties are awash at high water.

After crossing the bar, the channel is well marked and easily followed to Newburyport. The channel leads between the daybeacon marking **North Pier** and a buoy marking **South Pier,** which bare at half tide. Westward of South Pier for the best water favor the Newburyport, or south, shore until up with the overhead power cables, and the buoy under them, then head up for the north draw of the highway swing bridge, still favoring the south side of the channel and select anchorage, or obtain a mooring off one of the service facilities or marinas.

The channel between Newburyport and Haverhill is marked by buoys at the most difficult points, but is narrow and crooked, and leads close to rocks in places. Local knowledge is required to keep in it.

In June 1959, it was noted that several of the buoys in the narrows at Merrimack Park and just below Rock Bridge towed under during the strength of the ebb.

Tides and currents.—The mean range of tide is about 8 feet at the entrance. Currents are strong in the river and yachts sometimes drag when anchored off the American Yacht Club. Strangers should use a mooring if available. Current predictions at the entrance and at Newburyport, may be obtained by ratios and differences contained in the Tidal Current Tables.

Freshets occur in the spring but do not interfere with navigation as a rule. The water in the river is reported to be fresh for about 7 months in the year.

Ice seldom obstructs navigation below the bridge at Newburyport. Westerly winds carry the drift ice out to sea and during their continuance, the flood current has no effect upon the local formation of drift ice. With the wind from any other direction the flood current will prevent the drift ice from leaving the river.

Above the lower bridges the river is liable to be closed by ice from January to March.

See Appendix for **storm warning** displays.

Pilots.—There are no pilots at Newburyport. A pilot for the river can be obtained from the Merrimack River Navigation Company Marina at the Groveland Bridge. Information on the river can be obtained from the local boatman at Plum Island Point or any of the service facilities of marinas at Newburyport.

Towboats.—There are no tugs at Newburyport but there are three at Portsmouth, the masters of two of which are licensed pilots.

Supplies.—Gasoline, diesel oil, fresh water, ice, provisions, bottled gas, marine hardware, yacht supplies, and ship chandlery can be obtained. Gasoline and a limited supply of fresh water can also be obtained at Plum Island Point just inside the entrance of the river.

Repairs.—There are a number of boat and repair and building yards in and about Newburyport and several machine shops. Hull, engine, electric and electronic repairs can be made. Marine railways, the largest of which can haul out craft up to 65 feet, are available.

In June 1959, a larger marine railway was under construction on the north bank about 500 yards east of the highway bridge. It will haul out small draggers and trawlers. A 30-ton travel lift is also available in Newburyport.

Small craft facilities.—The port has a number of service landings for small craft, several of which are fully equipped marinas. There is a depth of from 12 to 15 feet alongside the landings. There are several ramps for launching small craft from trailers. There is a town wharf and float landing on the north bank east of the highway bridge. Most services are obtainable.

The facilities are along the Newburyport waterfront both below and above the bridges. Party and charter hire fishing boats are available at Newburyport and at Plum Island Point, close westward of the Coast Guard pier inside the entrance, where rowboats can also be rented. Outboard engine repairs can be obtained at most of the service landings on the river.

There are two yacht clubs; one, the American Yacht Club, at the east end of town, has 14 feet alongside its float landing. Gasoline and water are piped to the float. Facilities such as restrooms, showers, and a snack bar are available to visiting yachtsmen. The North End Yacht Club is near the west end of the town above the bridge.

The American Yacht Club maintains guest moorings for visitors and the marinas have slips for overnight berthing. Almost all the facilities maintain guest or moorings for hire. Showers are also available at some of the marinas.

Customs.—There is no custom house at Newburyport. Gloucester handles the formalities.

Immigration.—Immigration matters are handled from Boston.

There are a hospital, post office, several banks, and bus, railway, telephone and telegraph communications.

The following towns and places on Merrimack River are not shown on the charts:

Amesbury (P.O.) is on the **Powwow River,** about 1 mile above its confluence with the Merrimack. There is a large marina and boatyard which has two marine railways at the mouth of the Powwow. Craft up to 60 feet in length can be hauled out for hull repairs or dry, open or covered winter storage.

Gasoline, diesel oil, and water are piped to the float landings which have 8 feet alongside. Ice, provisions, hardware, bottled gas, yacht and marine supplies, and ship chandlery can be furnished. There is a launching ramp. Overnight berthing is permitted and several guest moorings are maintained.

There is a **harbormaster.**

A boat repair and building yard with marine railway close westward of the marina can build or haul out for hull repair or dry, open storage craft up to 30 feet.

Merrimacport is a village on the north bank of Merrimack River about 10 miles above the entrance. The village has a repair shop and a marine railway capable of hauling out for repairs or building craft up to 34 feet in length. A natural ramp for launching small craft from trailers and a float landing with 4 feet alongside are available at the boatyard.

Groveland (P.O.) is a town on the south bank of the river 15 miles above the entrance. There is a marina and boatyard at Riverside on the north bank close eastward of the highway bridge. The yard has two float landings with 9 feet alongside and a 40-ton travel lift that can haul out craft up to 65 feet in length for hull or engine repairs or dry, open winter storage.

Gasoline, diesel oil, and water are piped to the floats. Ice, provisions, hardware, yacht supplies, bait and tackle, and bottled gas can be obtained. There is a 1,800-foot landing strip; a seaplane and landplane, and complete flying service are available at the marina. The yard has a 20-ton and a 10-ton crane. The owner and manager of the marina is also pilot for the river. There are two ramps at the facility; one of which is hard-surfaced.

Haverhill (P.O.) is a city on the north bank, at the usual head of navigation of the Merrimack River, 18 miles above the entrance. Some wharves have depths of 10 feet or more, but there has been no commerce by water for many years.

Bradford (P.O.), a town on the south bank of the river is connected by a highway bridge with Haverhill. A yacht club on the west side of the bridge has water piped to its float landing. Small craft anchor or secure to moorings on the south side of the river above and below the bridge.

Chart 213.—Plum Island River forms a thorofare for small craft between Merrimack River, just inside its entrance, and Plum Island Sound. It is bare in places at low water and is said to have a depth of 7 feet at high water, but the deepest draft that has gone through it at high water with local knowledge is about 4 feet. The channel is narrow and marked by state maintained buoys, but does not always lead in midchannel, and local knowledge is necessary for its navigation. It is crossed by a highway swing bridge with a clearance of 7 feet in the

west draw; operating regulations are given in § **203.60,** Chapter 2.

The approach to the north end of the thorofare is between the east side of Woodbridge Island and the west end of a breakwater, which is covered at high water, and is marked on the end by a buoy. The buoys in Plum Island River are maintained by the Commonwealth of Massachusetts from May 15 to October 15.

From Merrimack River entrance the seacoast, formed by **Plum Island,** is sand dunes, and trends southward for about 7.5 miles to the entrance of Plum Island Sound and Ipswich River. There are many cottages on the south side of Merrimack River entrance, and scattered cottages southward along the beach for about 0.5 mile. The remainder of the island southward to Ipswich Bay for the most part is a Federal wildlife sanctuary.

Charts 213, 243.—Ipswich Bay is the bight between the northern point of Cape Ann and the south end of Plum Island. Between these points it is about 6 miles wide and makes in southward about 3 miles. The bay is the approach to Plum Island Sound, and Essex and Annisquam Rivers. It has depths of 20 to 70 feet, except in its southern and southwestern sides where the shore should be given a berth of a little over 1 mile to avoid the shoals off the river entrances.

Ipswich Light (42°41.1′ N., 70°46.0′ W.), 50 feet above the water and visible 12 miles, shown from a white skeleton tower with a white rectangular daymark is on Castle Neck at the south side of the entrance to Plum Island Sound.

The Crane mansion known as **The Castle,** on **Castle Hill,** is the most prominent landmark on this stretch of coast and can be seen for a great distance. The bathing pavilion and both houses on Ipswich (Crane) Beach at Ipswich Light are also conspicuous.

Chart 213.—Plum Island Sound, the approach to several small rivers, is frequented by many small craft. The bar channel at the entrance to the sound is subject to continual changes. The buoys on the bar are not charted as they are frequently shifted in position.

In 1959 local boatmen reported that with local knowledge 6 feet could be taken over the bar and through the entrance into Plum Island Sound except in heavy easterly weather.

Bass Rock, a stone ledge southward of Plum Island is marked by a daybeacon. In June 1958, shoaling was reported to extend from Plum Island to a point 200 yards southward of the daybeacon on Bass Rock, constricting the entrance channel at this point to a width of less than 200 yards.

A number of the buoys in Plum Island Sound are reported to tow under during the strength of the tide. Too great reliance should not be placed on them as marking the best water. Local knowledge is recommended for strangers attempting passage through the sound for the first time.

Ipswich River, emptying into the south end of Plum Island Sound from the westward, leads to the town of **Ipswich** (P.O.) about 2 miles above the entrance to the river at Little Neck.

The channel is buoyed to a point southwestward of Little Neck and by stakes above that point in summer.

Many years ago a channel was dredged through sand bars known as **The Shoals** and **Labor in Vain,** but a 1954 survey showed that the river had shoaled to 1 foot in places.

In 1959 local boatmen reported that with local knowledge a 4-foot draft could be carried from Plum Island Sound, across the bar at the entrance to the river at Little Neck, to the town landing at Ipswish, where there are three floats with 2 to 4 feet alongside but no services. Several party fishing boats operate on weekends in the summer months from the landings.

Close above the town landing is a service float with 2 feet alongside to which gasoline and fresh water are piped. Diesel oil can be obtained from tank truck. Ice, provisions, hardware, yacht supplies, bottled gas, and bait and tackle can be obtained at the float. Meals and lodging as well as other services are available in the town. Rowboats and outboards can be hired.

The launching ramp of the Ipswich Boat Club is just above the service float. There are two floats there with 2 feet alongside and a telephone booth.

The town of Ipswich is of great colonial antiquity and importance historically. It has railroad, bus, telephone, and telegraph communications, and markets. Most services are available.

Little Neck, a summer settlement on a prominent hill on the north side of the entrance to the river has a town landing on the west end of the neck, with a float with 2 feet alongside. There are no services at the float.

Great Neck is a distinctive headland on the west side of the south end of Plum Island Sound. It has two high hills, **North Ridge** and **Plover Hill,** that are very conspicuous.

The Ipswich Bay Yacht Club is on the northeast end of the neck. Gasoline and fresh water are piped to its float landing which has 4 feet alongside. The club has restrooms, showers, restaurant, and limited accommodations for visiting yachtsmen. Ice, provisions, and yacht supplies can be obtained from Ipswich.

During the summer months many yachts moor off the landing in 10 to 15 feet, sand and mud bottom. The club maintains moorings and usually one can be found for a guest.

A special small-vessel **anchorage** area has been established off the northeastern end of Great Neck; limits and regulations are given in § **202.1** and § **202.22,** Chapter 2.

Rowley River, which empties into Plum Island Sound at **Hog Island Point,** about 1 mile north of Great Neck, dries in many places and is unmarked. There are several landings on the river and a town float landing and yacht club about 250 yards above the Boston and Maine railroad bridge which has a clearance of 11 feet. There is little water at either landing and no services. The railroad station is only a short distance from the landing. The village of **Rowley** (P.O.) is about 0.5 mile from the

station. The channel is reported to be marked by bush stakes during the summer.

Parker River, emptying into the north end of Plum Island Sound from westward, has a depth of about 4 feet in a very narrow channel to a fixed bridge at **Newbury Old Town,** 1.6 miles above the entrance. This highway bridge has a clearance of 11 feet. The town is principally a summer settlement.

The channel is only partially marked by buoys and is difficult to follow. In 1959, local boatmen reported that 6 feet could be taken to Newbury Old Town with local knowledge.

Numerous pleasure craft of all sizes frequent the river. A special small-vessel **anchorage** extends downstream from the bridge; limits and regulations are given in **§ 202.1** and **§ 202.20,** Chapter 2.

There are two marinas at the south end of the bridge. Gasoline and fresh water are piped to the floats, and provisions, ice, yacht supplies, and bottled gas can be obtained. Overnight berthing with electricity supplied is available at the slips; moorings are maintained in the stream. Restrooms, telephone, and a snack bar are available.

Marine railways and a travel lift are available at the marinas and at a boat building yard about 250 yards downstream. Craft up to 40 feet in length can be hauled out for hull or engine repairs or dry, covered or open winter storage. Electric and electronic repairs can be arranged for.

A town wharf and float landing with 2 feet alongside is on the north side just below the bridge.

The Old Town Yacht and Country Club is on the south bank about 0.3 mile below the bridge. The depth is reported to be 4 feet alongside the club float and also those of the marinas. Restrooms and showers are said to be available to visiting yachtsmen at the club.

There are hard-surfaced ramps for launching boats from trailers at the marinas near the town wharf, and at the yacht club.

Above Newbury Old Town, the river is reported to be navigable for several miles, but is seldom used. This section of the river is crossed by three fixed bridges, one railroad, and two highway, at 2.7, 4.4, and 5.2 miles, respectively, above the entrance. All are reported to have clearances over 7 feet.

See Appendix for **storm warning** displays.

Chart 243.—Essex Bay and **River** are about midway between Ipswich and Annisquam Harbor Lights. The entrance is over a shifting bar over which, with local knowledge, 5 feet can usually be carried. With onshore winds on an ebb tide, a heavy chop builds up and during heavy weather the bar is often impassable. Caution, especially for small craft, is always indicated.

The river is navigable to the town of Essex, about 5 miles above the entrance. Local fishermen and numerous pleasure craft use the river.

The channel is buoyed from the bar to about 2 miles above the entrance, but as it is subject to continual changes, the buoys are frequently shifted in position and are not shown on the chart, with the exception of the entrance buoy.

From a point about 3 miles above the entrance, a Federal project provides for a dredged channel 4 feet deep to the fixed highway bridge at Essex, which has a clearance of 5 feet. In 1957 the project depth was obtained.

The town of **Essex** (P.O.) maintains lighted markers in the lower half of the dredged channel, and the upper half is reported to be marked by bush stakes in summer. The channel is narrow and difficult to follow.

There is a marina on the south bank about 200 yards below the bridge at Essex. Gasoline and fresh water are piped to its float landings which have 4 to 5 feet alongside. Ice, provisions, and some supplies can be obtained there, and it has a marine railway that can haul out craft up to 65 feet in length for hull or engine repairs.

Marine harware, yacht supplies, hull, engine, radio, and electronic repairs can be made at a ship and yacht yard near the bridge. The yard builds sail and motored craft up to 120 feet in length, and provides open and covered dry winter storage.

Restaurants, lodging, and motels are on or near the waterfront; and the town has markets, bank, and bus. telephone, and telegraph communications.

A private residential yacht club is at **Conomo Point.**

Chart 233.—The **Annisquam River** and **Blynman Canal** comprise a thorofare leading from the eastern part of Ipswich Bay, northwest of Cape Ann, to Gloucester Harbor, on the south side of the cape. A Federal project provides for an 8-foot channel from Ipswich Bay to Gloucester Harbor. In October 1957, the **controlling depth** was 8 feet.

This thorofare is narrow but is adequately marked by lights, daybeacons and buoys, and is extensively used by many small craft. Strangers should have no trouble getting through with a smooth sea and by the use of the Chart. The bar at the northern entrance is very difficult to cross in a heavy sea. The best time is on a rising tide.

Tides and currents.—The mean range of the tide is about 8.5 feet. Currents at Annisquam Harbor Light average 1.2 knots at strength.

Annisquam Harbor Light (42°39.7′ N., 70°40.9′ W.), 45 feet above the water and visible 12 miles, is shown from a white cylindrical tower, 41 feet high, with elevated walk to a dwelling on **Wigwam Point** at the east side at the northern entrance to Annisquam River. From May 15 to October 15, the fog signal at the light is operated in daylight hours only, but for the remainder of the year it is operated at all times during fog or periods of low visibility. The light is exhibited in daylight, whenever the fog signal is operating. A red sector in the light from 180° to 217° covers the shoals on the eastern side of the approach to the bar channel from the north. A lighted bell buoy marks the approach.

Bridges.—A little over halfway from Ipswich Bay to Gloucester Harbor a fixed highway bridge crossing the

thorofare has a clearance of 65 feet. The railroad bridge, midway between the fixed highway bridge and the bascule bridge, has a clearance of 16 feet. The bascule highway bridge at the southern entrance to the canal has a clearance of 7 feet.

Dangers.—No special directions are necessary. The chart is the best guide. Care should be taken to avoid a drying reef, marked by a daybeacon, on the east side of the channel about 0.2 mile southward of Annisquam Harbor Light, and a sunken rock, with 4 feet over it, marked by a buoy also on the east channel edge about 140 yards northward of Annisquam River Channel Light 25.

Annisquam (P.O.) is a village and summer resort on the east side of Annisquam River just inside its north end. **Lobster Cove** on the southeast side of the town is the scene of much small pleasure boat activity during the summer. A fixed wooden highway bridge with a clearance of 3 feet crosses the cove about 400 yards above the entrance.

In November 1958 the cove was dredged to a depth of 8 feet as far as the bridge. Buoys mark the anchorage limits. A town float landing is on the south side of the bridge.

There is a marina on the west side and several private float landings around the cove. Gasoline, diesel oil, and fresh water are piped to the floats of the marina. Ice, provisions, yacht supplies, hardware, bait and tackle, and bottled gas are available. Restrooms are available, and motorboats and outboards can be chartered or hired. Overnight berthing is permitted and guest moorings are maintained.

A private marine railway that can haul out craft up to 40 feet in length in an emergency is on the west side of the cove near the entrance.

The Annisquam Yacht Club is on the point on the west side of the entrance. The usual courtesies are extended by the club to visiting members of accredited yacht clubs. Showers, restrooms, and limited guest accommodations are available to visiting yachtsmen. Water is piped to the float, ice is obtainable, and guest moorings are maintained by the club. A daybeacon and a buoy mark dangerous ledges south of the yacht club.

There is a **harbormaster** who supervises the moorings and anchorage. A **speed limit** of 4 knots is enforced on the river and in the cove.

Local magnetic disturbance.—Differences of as much as 3° from the normal variation have been observed in the vicinity of Annisquam.

Mill River is a tributary of Annisquam River, on the east side, 0.4 mile southward of Annisquam. There are numerous summer homes and float landings on the river which is used by many small craft in the summer. There is a boatyard with marine railway on the west side of **Wheeler Point,** which can haul out craft up to 35 feet for hull or engine repairs or dry, open winter storage.

On the east side of Annisquam River, just north of the fixed highway bridge at **Ferry Hill** there is a boatyard that can build or haul out for repairs or winter open or covered storage craft up to 35 feet.

On **Rust Island** on **Little River,** just in from **Biskie Head,** there is a marina with 7 feet alongside its float landings. Gasoline and fresh water are piped to the floats and most services can be provided. There is a snack bar, and ice, provisions, and yacht and marine supplies can be obtained. Guest moorings are available.

Chart 243.—**Bay View** is a village on **Hodgins Cove,** 0.8 mile northeastward of Annisquam Harbor Light. A lobster plant is on a long stone pier having a depth of 16 feet on the outer half of the southwest side, in a channel about 70 feet wide. The cove at the inner end of the pier on the northeast side has a depth of about 2 feet at the entrance and mostly dry inside. Unmarked rocks are at the entrance.

Cape Ann is very rocky and broken, 235 feet high at **Pool Hill,** its highest point, with numerous summer homes, and has several abandoned granite quarries. Communication is by railroad to Gloucester and Rockport, and by highway entirely around the cape.

Lanes Cove, 1.4 miles northeastward of Annisquam Harbor Light, is a small cove protected by stone breakwaters at the entrance, forming a harbor for small craft. It has a depth of 12 feet at the entrance and 10 feet in the middle inside. **Lanesville** (P.O.) is a village on the cove. A barge wreck is on the southeast side of the cove. Many fishing and pleasure craft moor in the harbor. Gasoline can be obtained from a service station near the head of the cove, and provisions, ice, and some supplies are available from a market in the village.

Folly Cove, on the north side of Cape Ann, 2.4 miles northeastward of Annisquam Harbor Light, has a stone wharf on the east side with about 16 feet alongside. A restaurant is on the wharf and a motel at the head of the cove, both open only in summer. A tall skeleton steel tower is most conspicuous on **Halibut Point,** the northern extremity of Cape Ann.

Ocean View is a summer settlement on **Andrews Point** at the north end of Sandy Bay. The settlement has no wharves. A dome on a stone house is prominent. A lighted gong buoy is 0.5 mile offshore north of the cape.

Sandy Bay is a large bight in the northeastern shore of Cape Ann, between Straitsmouth Island on the east and Andrews Point on the west. The bay is 2 miles wide between these points, and about 1.5 miles long to its head, Rockport Harbor.

A breakwater has been partially completed to form a harbor of refuge. It extends 1,200 yards northward from Avery Ledge, then 830 yards northwestward toward Andrews Point. In 1959 it was awash at low water except for a distance of about 300 yards near the middle where it was above high water. About 400 yards of each end of the breakwater are covered at low water. A lighted buoy is off the northwest end and a bell buoy is off the south end. It is reported that several boats have grounded on the breakwater. This can be avoided by keeping on the correct sides of the buoys marking the ends.

Sandy Bay and approaches, and an area 2.5 to 10 miles wide, northeastward, eastward, and southeastward

of Cape Ann, have been examined by means of a wire drag. Depths inside the breakwater are 31 to 86 feet, with several rocky spots of less depths in the southern part. **Twelvefoot Rock** on the south side of the bay is marked on its northern side by a buoy. The bay is sometimes used as an anchorage, but is exposed to north and northeasterly weather, and at such times Gloucester or Salem Harbors are generally used.

The entrance to Sandy Bay between Straitsmouth Island and the bell buoy marking **Avery Ledge** has broken bottom and a rocky spot with a depth of 22 feet in the middle. Strangers may be unable to avoid this, and should not use this channel when drawing more than 18 feet.

On the south side of this channel a ledge baring at places at low water and having depths of 16 and 11 feet near the end, extends 300 yards northeastward from the northeast end of Straitsmouth Island. The northern entrance to the bay westward of the lighted buoy at the northwest end of the breakwater is deep and clear.

Pigeon Cove (P.O.), 0.8 mile south of Andrews Point, is a small cove protected by a breakwater and having depths of 3 to 10 feet inside. The most prominent features of Pigeon Cove are the high concrete stack of the foundry and the tank on **Pigeon Hill.** There are bulkhead wharves around the harbor, and a public float landing with 6 feet alongside.

The best water is on the northeast side. A foundry is at the head of the cove. **Pigeon Rock,** 50 yards off the east point outside the jetty, is nearly bare at extreme low water.

Gasoline can be obtained from a service station near the head of the harbor, and provisions and some supplies can be obtained at a market. A number of fishing and pleasure craft lay at moorings in the cove.

Two old stone quarry piers are built out from the shore 0.3 and 0.5 mile southward of Pigeon Cove. The southerly one forms a harbor that is used by fishing and pleasure craft. Posted notices inform all craft to moor bow or stern out from the stone bulkhead wharf on the east side. A stone ramp, dry at low water, is at the head of the basin.

A third small basin at **Rowe Point,** about 0.7 mile southward of Pigeon Cove, is now a lobster pound.

Dodge, Bartlett, and **Mitchell Rocks** are in a cluster about 300 yards from the western shore of Sandy Bay between the two piers southward of Pigeon Cove. Dodge Rock is bare at low water and is marked by a daybeacon. The western end of the rock is 100 yards eastward of the southerly pier. The southern rock with 14 feet over it is 250 yards southeastward of the daybeacon.

Mitchell Rock, with 4 feet over it, and another rock, covered by 18 feet, are 280 and 400 yards, respectively, northward of the daybeacon and 350 yards eastward of the northerly pier. With the exception of Dodge Rock, all are unmarked.

Sandy Bay Ledge is partly bare at high water and extends 200 yards from the western shore of Sandy Bay, southward of the south stone pier.

Harbor Rock, with 2 feet over it, is 150 yards northeastward of the end of the north breakwater at the entrance of Rockport Harbor and is marked on its north side by a buoy. Inside the rock a shelving ledge extends 75 yards northeastward from the end of the north breakwater. It is not marked.

Rockport Harbor at the southwest end of Sandy Bay is a safe harbor, that is reported secure in all weather, and can be entered at any time. The harbor is protected by two breakwaters, one of which extends eastward from **Bearskin Neck** on the northwest side of the harbor.

Rockport Breakwater Light (42°39.6′ N., 70°36.8′ W.), 32 feet above the water, is shown from a red pyramidal skeleton tower on a white tank house on the end of the north breakwater.

The other breakwater extending in a northerly direction from **Norwoods Head** is a short one.

The entrance channel between the breakwaters is about 50 yards wide, in depths of from 10 to 14 feet, with the best water favoring the light on the north side.

The harbor consists of an outer basin and two inner basins which are separated by the town wharf. The central part of the outer basin has depths from 8 to 13 feet. The edges are shoal and foul, with ledges near the shores, particularly on the north side northward of a line between the end of the north breakwater and the end of the first wharf on the north side. All craft should stay out of that area.

The first wharf, known locally as New Wharf, has a float landing with 3 feet alongside. Gasoline and fresh water are piped to the float. Ice, provisions, and some supplies can be obtained at this landing. Diesel oil can be obtained from tank truck. Bait and tackle can be obtained, and rowboats and outboards can be rented.

The town float landing, with 6 feet alongside, is at the head of the town wharf. There is a 10-ton crane on the wharf which is used to lift out small craft for repairs. Party fishing boats operate from the landing in the summer months. There is parking on the wharf.

On the southeast side of the head of the town landing is the clubhouse and float landings, with 6 feet alongside, of the Sandy Bay Club. The club has restrooms, showers, and a snack bar said to be available to visiting yachtsmen. Fresh water is piped to the floats.

The basin on the southeast side of the town wharf is used to moor small sail craft. In 1959 there was reported to be 4 to 7 feet in this basin, but the head and edges were shoal and foul.

The northwesterly basin, or commercial basin, in 1959 reported to have depths of 3 to 4 feet with head and edges shoal, is used by fishing and lobster boats. A town ramp, dry at low water, and with 3 feet at high water, is at the head of the basin.

Moorings and berths in the harbor are under control of the **harbormaster,** who has an office on the northwestern side of the commercial basin on Bearskin Neck. A **speed limit** of 4 miles per hour is enforced within harbor limits. There are no guest moorings but one can usually be arranged for through the harbormaster.

Rockport (P.O.), the town, has communication by railroad and highway, telephone and telegraph service, banks,

churches, restaurants, hotels and guest houses, hospitals and markets.

In 1959 a small basin, known as the **Old Harbor** on the northwest side of Bearskin Neck, was bare at low water and used only by a few rowboats and skiffs.

Straitsmouth Island, low and grassy, is marked on its eastern end by **Straitsmouth Light (42°39.7′ N., 70°35.3′ W.),** 46 feet above the water, visible 8 miles, and shown from a white cylindrical tower, 37 feet high, near the northeast end of the island.

A Coast Guard station is south of **Gap Head** westward of Straitsmouth Island. The lookout tower and buildings of the station are very conspicuous. See Appendix for **storm warning** display.

Flat Ground, dangerous ledge 0.5 mile long, with 2 to 12 feet over it, is 1 to 1.5 miles north-northeastward of Straitsmouth Light. The ledge is marked by two buoys, one at its south end, and a bell buoy at the north end. The wreck of the liberty ship CHARLES S. HAIGHT is no longer visible on the reef.

Dry Salvages is a bare ledge about 15 feet above high water near the middle of a reef about 500 yards long in a northerly direction. A lighted bell bouy is 0.5 mile northeastward of the ledge.

Little Salvages is a ledge showing well bare at low water and with parts awash at high water. It is about 500 yards westward of Dry Salvages. Shoal water extends out a little more than 200 yards from the western side of the bare part of the ledge, and a rock bare at lowest tides is between it and Dry Salvages.

Cape Ann Light (42°38.2′ N., 70°34.5′ W.), 166 feet above the water and visible 19 miles is shown from the 124-foot high southerly of two identical gray stone towers on the east side of Thacher Island, 1.3 miles south-southeast of Straitsmouth Island. The northerly tower is not lighted. The fog signal is at the light. **A lighted whistle buoy** is 2.5 miles eastward of the light. **Oak Rock,** marked on its east side by a buoy, lies between Thacher Island and **Emerson Point.**

Londoner, a ledge about 0.4 mile long in a northeasterly direction, with depths of 7 to 11 feet over it, is 0.5 mile east-southeastward of Cape Ann Light. Near the center of the ledge, on a cluster of rocks that bare at low water, is a daybeacon. Between Londoner and Thacher Island is a passage with 12- to 26-foot depths. This passage should not be attempted by a stranger.

Milk Island, about 0.4 mile southward of Emerson Point, is connected with that point and Thacher Island by two bars having depths of 3 to 7 feet. **Salt Island Ledge** bares at extreme low water.

There are numerous reddish brown, bare bluffs along the coast between **Cape Hedge** and Eastern Point. The most prominent of these are on Cape Hedge, **Salt Island,** the points to the north and west of Salt Island, the points on both sides of the entrance to **Brace Cove,** and on the southern part of Eastern Point.

10. CAPE ANN TO BOSTON HARBOR, MASSACHUSETTS

Chart 1207.—Massachusetts Bay is the body of water lying westward of a line connecting Cape Ann Light, on Thacher Island, with Race Point Light on the northwestern extremity of Cape Cod, about 38 miles south-southeastward; it includes Boston Harbor, described in Chapter 11, and Cape Cod Bay, described in Chapter 12. Between Cape Ann Light and Boston Harbor, 24 miles to the southwestward, the principal harbors are those of Gloucester, Beverly, Salem, Marblehead, and Lynn, all available to vessels of moderate draft. The coast is rocky, generally bold, with numerous detached islands, rocks, and sunken dangers.

Boundary lines of inland waters.—The lines established for Massachusetts Bay and the waters covered by this chapter are described in **§ 82.10,** Chapter 2.

Chart 233.—Gloucester Harbor is one of the most important fishing ports in the United States and an important harbor of refuge. It is 5 miles southwestward of Emerson Point, the easternmost point of Cape Ann. The entrance is marked on its eastern side by Eastern Point Light. There is an outer and inner harbor, the former having depths generally of 24 to 36 feet, and the latter depths of 15 to 24 feet.

Gloucester (P.O.) is a city of great historical interest, the first permanent settlement having been established in 1623. The city limits cover the greater part of Cape Ann and part of the mainland as far west as Magnolia Harbor. Its principal industries are for the most part directly or indirectly connected with the fishing or related industries in the processing, freezing, canning, or shipment of fish and lobsters.

Eastern Point Light (42°34.8′ N., 70°39.9′ W.), 57 feet above the water and visible 13 miles, is shown from a white conical tower, 36 feet high, with a covered way to a dwelling; a fog signal is at the light. The radiobeacon antenna is about 50 yards north of the light. See Appendix for **storm warning** display.

A breakwater extends 750 yards northwestward from the shore near Eastern Point Light, and is marked at its outer end by **Gloucester Breakwater Light (42°34.9′ N., 70°40.4′ W.),** 45 feet above the water, visible 11 miles and shown from a white house and tower on a brown square skeleton framework structure, 37 feet high; a fog signal is at the light.

The entrance westward of the breakwater between Dog Bar and **Muscle Point** is about 0.6 mile in width but of this only 500 yards is clear to depths of 30 feet or more.

Dog Bar, on which the breakwater is built, extends 100 yards beyond the end of the breakwater where it is marked by a buoy.

Round Rock Shoal, a rocky ledge, about 400 yards in extent northeast to southwest, with a least depth of 13 feet, extends from 0.15 to 0.3 mile westward of the breakwater light. It is marked on its northeastern edge by a buoy and on its southwestern edge by a lighted buoy.

The channel between the end of Dog Bar and the eastern edge of Round Rock Shoal is only about 150 yards wide with depths of 20 to 22 feet.

About 500 yards westward of Round Rock Shoal, an unmarked rocky ledge has a least depth of 27 feet. This leaves only a channel about 450 yards wide with depths of 38 to 47 feet into the harbor.

During heavy southeasterly gales the sea at times breaks nearly the whole distance across the entrance. Strangers should enter by the deepest channel westward of Round Rock Shoal, where there is reported to be a space known not to break.

Normans Woe, on the west side at the entrance to Gloucester Harbor, is a rocky headland, which is split by a deep cleft, known as **Rafes Chasm,** into which the sea enters spectacularly during heavy weather. **Normans Woe Rock,** 0.3 miles northeastward of Normans Woe and over 0.1 mile offshore, is a dark rocky islet 45 feet high, surrounded by extensive ledges. A bell buoy is 0.2 mile southeastward of it. The twin towers of the John Hays Hammond Museum, about 0.3 mile northward of the rock, are conspicuous from seaward.

Southeast Harbor is the cove in the eastern part of Gloucester Harbor, northward of **Black Bess Point** and southward of Tenpound Island. It has good anchorage, soft mud and clay bottom, in about 23 to 30 feet, and is used generally by vessels taking shelter.

Eastern Point Yacht Club is on the north side of the entrance to the cove at the inner end of Gloucester Breakwater. There is a depth of 8 feet of water at its float landing, to which fresh water is piped. The club maintains three guest moorings and certain services for visiting members of associated yacht clubs.

Western Harbor is the semicircular cove in the northern part of Gloucester Harbor northwestward of Tenpound Island. It has good anchorage, soft mud and clay bottom, in from 24 to 30 feet, taking care to give the shore a berth of 300 yards. There are no wharves. The city of Gloucester maintains a parkway along the shore of Western Harbor. The Statue, **Gloucester Fisherman,** faces the harbor from this parkway.

The southern entrance to **Blynman Canal** and Annis-

quam River is through Blynman Bridge at the head of Western Harbor. This is the inside route to Ipswich Bay on the north side of Cape Ann and is described in Chapter 9. The school tower about 500 yards north of the bridge is prominent.

Tenpound Island Light (42°36.1′ N., 70°40.0′ W.), 44 feet above the water and visible 12 miles is shown from a white pyramid tower on the west side of the island, off the entrance to the Inner Harbor; a fog signal is at the light. In 1959, the former government pier and buildings, in poor condition, had been abandoned, and the island sold to the city of Gloucester.

Green Rock, 175 yards eastward of Tenpound Island, is marked by a daybeacon. The passage between Tenpound Island and Rocky Neck is shoal and foul, and should not be attempted, especially by strangers.

Tenpound Island and **Mayflower Ledges**, on the eastern side of the approaches to the Inner Harbor, have least depths of 18 feet, and are marked by buoys. **Prairie Ledge**, on the western side, has a least depth of 4 feet, and is marked on its eastern end by a buoy. **Babson Ledge**, also on the western side, has a least depth of 13 feet and is marked on its south side by a buoy.

Rocky Neck is a high and partly wooded island on the east side at the entrance of the inner harbor. It is connected with shore eastward by a causeway. **Black Rock**, about 100 yards off the western end of Rocky Neck, is marked by a daybeacon.

Inner Harbor limits begin at a line between this daybeacon and **Fort Point**. A **speed limit** of 9 miles per hour is enforced within the inner harbor. A rocky patch, with a depth of 17 feet in the middle of the entrance, is marked by a buoy.

Harbor Cove, on the northwest side just inside the entrance to Inner Harbor, has general depths of 15 to 18 feet. In 1959 dredging was in progress at some of the wharves in the cove to deepen the slips.

In 1959, 21 feet could be carried in the channel along the wharves on the northwest side of the inner harbor, and there were depths of 20 to 22 feet, generally, along the northwest side of the State Fish Pier. Further dredging was in progress in the harbor.

Anchorage.—The best anchorage in the outer harbor for vessels coming in for shelter or bound to Gloucester is in Southeast Harbor, known locally as **Pancake Ground**. This is the one most frequently used. Anchorage in Western Harbor is also good, and is often used. Anchorage in the Inner Harbor is permitted only in a small area between Rocky Neck and the State Fish Pier, and in Smith Cove. Permits for mooring in Inner Harbor are issued by the Deputy Harbormaster, who patrols the harbor in the police and fire boat.

Smith Cove provides good anchorage for small craft in from 6 to 16 feet, but is somewhat congested with moorings. There is a large marina in the cove which has 9 feet of water at its floats. Gasoline, diesel oil, and fresh water are piped to the floats and most services can be provided.

Directions.—Gloucester Harbor and approaches have very broken ground and many rocks and ledges, some of them unmarked; and careful navigation is necessary, especially in thick weather. The harbor and approaches have been examined by means of a wire drag, and the dangers are charted.

The principal dangers for vessels of 24-foot or less draft to an anchorage in Southeast Harbor, and for 18-foot or less draft into the inner harbor, are marked. Strangers are advised not to try to bring in greater drafts.

No special directions are necessary. Charts 243 and 233 are the guide for approaching and entering Gloucester Harbor.

Tides.—The mean range of tide is about 8.7 feet.

Currents.—The tidal currents in Gloucester Harbor do not to any great degree interfere with the movements of vessels, as they set directly in and out of the harbor and their velocity is comparatively small. However, the tidal currents in the entrance to Blynman Canal average over 3 knots at strength.

Ice seldom extends outside Tenpound Island at the entrance to the inner harbor. The movement of boats generally keeps the inner harbor open.

Pilotage is compulsory for all vessels over 7-foot draft, except fishing vessels engaged in foreign trade but not for vessels engaged in coastwide trade. There are no licensed pilots in Gloucester, but arrangements for pilotage can be made through the harbormaster. A pilot for the harbor resides at Marblehead.

Towboats.—The nearest towboats are stationed at Boston.

Quarantine.—Vessels subject to quarantine regulations are usually boarded at the dock. An outpatient office is maintained in Gloucester by the U.S. Public Health Service.

Customs.—Gloucester is a port of entry and marine documents are issued.

Immigration.—There is no Immigration Office at Gloucester. Routine matters are handled by the Customs Boarding Officer on arrival at the dock.

The Gloucester Coast Guard Station and office of **Captain of the Port** is on the west side of Gloucester Harbor entrance in Oldhouse Cove on Dolliver Neck.

Harbormaster.—The Chief of Police is the harbormaster. The deputy harbormaster patrols the harbor in the police and fireboat, supervises the moorings in the anchorages, and issues permits for them.

Wharves.—Gloucester has a great many wharves, most of which are used in connection with the fishing industry. Depths vary up to 22 feet. Dockage and wharfage are not usually charged. A public wharf and float landing for small craft at the extreme head of Harbor Cove has a depth of about 4 feet alongside. There is no railroad connection to the wharves.

Supplies.—Fuel oil is not available in bunker quantities, but diesel oil can be had as desired. Ship chandlery and all other supplies also are obtainable. Fresh water of good quality can be had at the wharves.

Repairs.—Gloucester has ship repair plants on Rocky Neck and on the northwest side of the harbor. The two plants have machine and other shops, and can carry out all repairs to wood and steel vessels. The largest marine

railway can haul out craft up to 130 feet in length and up to 600 tons in weight. Radio and electronic repairs can be made.

Boston is the nearest port where large vessels can be drydocked for extensive repairs to hull and machinery.

Small craft facilities.—Gloucester has a considerable number of well-equipped boat and yacht yards with marine railways, travel lifts or heavy cranes, and storage facilities. Craft up to 45 feet can be hauled out for hull or engine repairs, or dry, covered, or open winter storage. Most all have float landings with from 5 to 15 feet alongside.

Gasoline and fresh water are usually piped to the floats and in some cases diesel oil, but the latter can also be obtained by tank truck. Several of the boat yards are equipped as marinas with restrooms, some of them showers, snack bars, and overnight accommodations.

Most of the small craft facilities are located from Smith Cove along the east shore of the harbor to the head. There are other service facilities on the northwestern side of the harbor and in at the head of Harbor Cove at the float landing at which gasoline and fresh water, and other services can be obtained. There are two town ramps at the northwestern end of Blynman Canal, near the high school, where small craft can be launched from trailers. A town float landing is at the head of Harbor Cove.

Ice, provisions, sails, yacht supplies, hardware, bottled gas, and most other essentials can be obtained, and ship chandlery is available.

Party fishing boats operate from several points in the harbor during the summer, and charter boats, rowboats, and outboards can be hired.

Communications.—Gloucester has rail and highway connections, telephone, telegraph, and bus service. Schools, churches, banks, restaurants, lodging, library, and a hospital are in the city.

Chart 243.—Magnolia Harbor is a cove about 1.5 miles westward of the entrance to Gloucester Harbor and just north of **Kettle Island.** The summer resort of **Magnolia** is conspicuous on the eastern side. It has a public pier and float with about 2 feet alongside. The harbor is used by many small craft, but the holding ground is not very good and the cove is exposed to southerly weather. There are no facilities at the landing, but gasoline can be obtained in cans from garages at the head of the harbor. Provisions and some supplies can be obtained, and there are hotels, restaurants, markets, and stores.

The large summer homes on **Magnolia Point,** an old wartime concrete observation tower painted white on **Goldsmith Point,** and a large bathing pavilion and several bathhouses on the beach at the head of the harbor are conspicuous.

The edges and head of the harbor are shoal and foul, and none of the dangers are marked. There are no aids, and the harbor is at best temporary anchorage for small craft in foul weather or offshore winds.

Kettle Cove, next west from Magnolia Harbor, is shoal and foul at the head. There is one private landing on the east side of the entrance but no facilities. Large private homes on Goldsmith Point and **Crow Island** are conspicuous.

Chart 240.—Off the shore eastward of Manchester Harbor entrance, between Gloucester entrance and House Island, are many islands, rocks, and ledges extending about 0.8 mile offshore, all but one of which are unmarked. The farthest outlying ones, named in order from eastward, are: **Great Egg Rock,** high and bare; **Boohoo Ledge,** bare at low water; **Salt Rock,** showing at high water; **Pickett Ledge,** bare at low water; **Gales Ledge,** and **Pilgrim Ledge.** Of the several coves, only Manchester Harbor is of interest to navigation.

The shoreline of this section of the coast is lined with summer homes, many of which are large and conspicuous. The bathing pavilion and beach at **Eagle Head** are conspicuous.

Manchester Harbor, about 5 miles westward of Gloucester Harbor, is formed by an arm of the bay extending west of **Gales Point** in a northeasterly direction for 1 mile to the town of **Manchester (Manchester-by-the-sea).** The entrance to the outer harbor is northward of Bakers Island Light, between **House Island,** partly wooded, on the east, and **Great Misery Island** on the west. The ruins of two stone houses, one in the center and another on the west end, are on Great Misery Island.

Manchester Harbor is principally a yachting center, with only a small amount of local commercial fishing. The harbor above **Proctor Point** is practically landlocked and secure in all weather.

Prominent features.—A white square observation tower on Gales Point, a large standpipe on **Moses Hill** back of the town, the bascule span of the railroad bridge, the cupola and spire of the Town Hall, and the fishing pavilion at the end of the town wharf next to the yacht club at **Tucks Point.**

From a fairway buoy at the entrance, a narrow buoyed channel, 8 feet deep as far as Proctor Point, thence 6 feet to the head, leads generally north-northeastward for about one mile. There, a bascule railroad bridge with a clearance of 6 feet crosses it. Above the bridge is a mooring basin.

The mean range of **tide** is about 8.8 feet.

Anchorages.—By local regulations, vessels over 55 feet in length must anchor in the outer harbor. The anchorage is northward of a line between Great Misery and House Islands as far as the entrance fairway buoy. Those desiring to anchor only overnight or from head winds, may find fair holding ground and good shelter, except in southerly gales.

Anchorage in the inner harbor, northward of Proctor Point, is restricted to craft not over 55 feet in length. This regulation is strictly enforced. Some of the coves on each side of the fairway north of Proctor Point have been dredged to depths of from 6 to 10 feet.

The **harbormaster** supervises the moorings and on application will usually find a vacant one for a visitor or will advise where best to anchor. The yacht club and yacht yards maintain guest moorings.

The mooring basin at the head of the harbor was

dredged out in 1940 to a depth of 9 feet, but in 1959, it was reported that there was considerable shoaling on the east side and at the head.

Dangers.—There is a bad ledge, locally known as **Bow Bell,** with a rock awash on it, on the east side of the channel opposite the yacht club and public landing on Tucks Point, just above Proctor Point. A buoy marks the western edge. It is usually covered, and the only indication of it is a hole, or clear spot, amidst the craft moored or anchored in the vicinity. Care should be taken to avoid anchoring on the ledge.

Whaleback, a dangerous ledge in the entrance of the outer harbor of Manchester, is about 400 yards long east and west, and 200 yards wide. Near the middle of its northern side is a rock bare at low water, marked by a daybeacon. Between the ledge and House Island is a clear channel 250 yards wide. The channel westward of the ledge is 500 yards wide.

Sauli Rock bares 4.5 feet at low tide, is 300 to 400 yards eastward of the northeast end of Great Misery Island, and is marked on its south side by a buoy.

White Ledge, bare at low water, is 300 yards northwestward of House Island, and is marked by a buoy on its west side. **Halftide Rocks** covered at half tide, are 250 yards northward of White Ledge and are marked by a buoy off the northwest side.

Chubb Islet, bare and rocky, is 300 yards from the north shore of the outer harbor of Manchester, and should be given a berth of more than 200 yards.

Regulations.—In addition to the local regulations restricting the size of craft entering the inner harbor a **speed limit** of 5 miles per hour is enforced within the inner harbor.

Wharves.—There are no commercial wharves in use. The old coal dock at the head of the basin above the bridge was in ruins in 1959.

Small craft facilities.—There are commercial and private float landings in the harbor. There are four public float landings and two ramps for launching small craft from trailers. There are depths of from 5 to 15 feet at the landings. Gasoline, diesel oil, and fresh water can be obtained and provisions, ice, yacht and marine supplies are procureable.

There are two yacht yards with marine railways, the largest of which can haul out craft up to 80 feet in length for hull or engine repairs, or dry covered or open winter storage. Electric and electronic repairs can be made. Sail and motored craft up to 60 feet in length can be built. The Manchester Yacht Club is at Tucks Point at the entrance to the inner harbor. There is a depth of 6 to 12 feet of water at the floats to which gasoline and fresh water are piped. Restrooms and a snack bar are available at the club.

Manchester has rail, bus, and road communication, and telephone, telegraph, and postal service. There are banks, churches, markets, a hospital, and schools.

Directions.—Craft using the chart and following the aids should experience no difficulty in entering or leaving the harbor.

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Charts 240, 241.—Salem, Beverly, and Marblehead Harbors, each of which in turn will be described in detail later, form a large, irregular indentation in the shore of Massachusetts Bay, 11 miles southwestward of Cape Ann, and 12 miles northeastward of Boston Harbor entrance. Gales Point is the northern and Marblehead Neck the southern point at the entrance to this large indentation, which includes within its limits the harbors of Manchester, Beverly, Salem, and Marblehead, the distance between the two points being 4 miles. This wide space is studded with islands, bare rocks, and sunken ledges, through which are several channels leading into the harbors.

In 1959, Salem and Beverly had little foreign trade with the exception of arrivals twice a month of oil tankers from Venezuela, and weekly arrivals of coastwise colliers. There was some commercial fishing. The deepest draft entering is about 32 feet. Marblehead is principally a yachting center.

Prominent features.—The most conspicuous landmarks approaching the harbor are the islands, Baker, Great Misery, and Cat Island, and Marblehead Neck; a white square observation tower 90 feet high on Gales Point; a large standpipe on Moses Hill back of Manchester Harbor; the church spires in Beverly; the large power plant with three stacks on Salem Neck; a radio tower near Saugus Head; Abbott Hall and two standpipes, one with conical top on Marblehead; and the light, large mansions and homes, and a tall skeleton tower on Marblehead Neck. Two large mansions on the estates along the north shore westward of Manchester Harbor also stand out. **Bowditch Ledge Daybeacon,** a conical stone monument 27 feet high, is readily discernible to anyone approaching the harbor.

Bakers Island Light (42°32.2′ N., 70°47.2′ W.), 111 feet above the water and visible 17 miles, is shown from a white conical tower on the north end of the island; a fog signal is at the light. Many summer homes are on the island and there is a ferry landing on the west side.

Great Misery Island north of the main ship channel has the ruins of two stone houses on it.

Marblehead Light (42°30.3′ N., 70°50.0′ W.), 130 feet above the water and visible 13 miles, is shown from a brown square skeleton tower on the northern extremity of **Marblehead Neck,** a high rocky promontory connected with the mainland by a sand bar and causeway.

Marblehead Rock, 500 yards eastward of the northern end of Marblehead Neck, is a high bare rock marked by a round granite daybeacon.

Halfway Rock, 2 miles southward of Bakers Island, about 60 feet high and resembling a sugar loaf, has deep water around it. It is one of the most distinctive marks in the approach to the harbor.

North and **South Gooseberry Islands** are high, rocky islets on the western end of the extensive ledges southward of Bakers Island. **Dry Breakers,** the southerly part of the ledges, shows at high water as a low bare ledge.

Cat Island, 0.8 mile northeastward of Marblehead Neck, is more than 0.3 mile long, is bare and has a large build-

ing on the north end and smaller houses toward the center. There is a pier and float landing on the southwest side. The island is surrounded by extensive ledges, bare and submerged.

Eagle Island, 0.7 mile north-northeastward of the north end of Cat Island, is small, grassy, and rocky.

Coney Island, northward of Marblehead, is a low, grassy islet. It has a camp building that appears to be in ruin at a distance.

Channels.—Three main channels leading through the islands and rocks at the entrance are known as Main Ship Channel, Cat Island Channel, and Marblehead Channel. Several other channels of less importance are used only by local boats. These channels have been swept by wire drag, and all dangers found are shown on the chart. Most of the dangers adjacent to, or on the channel edges are marked.

Main Ship Channel, the most northerly, leads between Bakers and Great Misery Islands, and northward of Great and Little Haste. It is marked by **Hospital Point Lighted Range** on bearing **276°16′.** The channel has depths of about 33 feet until up to Smith Point if the range is closely followed. Several buoyed dangers are close to the sailing line and will be described later under dangers. This channel is used by deep-draft vessels.

Cat Island Channel, the middle one, has its entrance near Halfway Rock. It leads in a northwesterly direction, between Cat Island on the south and Satan Rock, the Brimbles, and Eagle Island on the north. The least depth in Cat Island Channel, about 26 feet, is between Eagle and Cat Islands.

Popes Head Channel, deep, clear, sheltered and buoyed, leads from the main channel in a southwesterly direction between Hardy Shoal and Eagle Island on the northwest and Bakers Island, Popes Head Shoal, and Brimbles on the southeast. It is used by most craft bound to Marblehead Harbor from the northeastward.

Marblehead Channel, the westerly one, leads in a northerly direction between Cat Island and Marblehead Neck. Several marked shoals with depths of 10 to 24 feet are close to the channel, and the sea breaks on them in easterly gales. Other shoals with depths of 19 feet or more are unmarked. This channel is not recommended for strangers drawing more than 12 feet.

South Channel is a branch of Marblehead Channel leading along the northern shore of the peninsula between Marblehead and Salem Harbors, and southward of the numerous rock and ledges on the east side of the entrance to Salem Harbor. The principal dangers are marked, but the channel is less than 100 yards wide in its narrowest part. It has a least depth of about 15 feet, but has not been closely examined, and should not be used by strangers except in small craft.

Anchorages.—Salem Harbor is sometimes used as a harbor of refuge, especially during the autumn. Good anchorage is available in what is known as the outer anchorage southward of the main channel and northward and eastward of Little Haste.

Special small-vessel anchorage areas have been established in Salem Harbor, off Palmer Cove, in Beverly Harbor, off northwest end of Salem Neck, and in Bass River; limits and regulations are given in **§ 202.1** and **§ 202.25,** Chapter 2.

Small craft moor in these special anchorages, on Monument Bar, north of Salem Neck, off Juniper Cove, or off the yacht club and yacht yards in the southwest end of the harbor off Palmer Cove. Some isolated moorings are in the east side of the harbor southward of **Naugus Head,** outside the seaplane restricted area.

In Beverly Harbor, a good anchorage is between Rams Horn Rock and Lobster Rocks daybeacons, a little south of the line joining them, in 18 to 24 feet. Small craft usually anchor on the south side of the channel between Lobster Rocks Daybeacon and the highway bridge, in 12 to 15 feet.

Marblehead Harbor is usually very congested with moorings southwestward of a line between **Jack Point** and **Fort Sewall.** The best anchorage for small craft is southward of a line between **Boden Point** and **Skinner Head.**

Dangers.—The approaches to Salem, Beverly, and Marblehead Harbors have very broken ground, and all of the channels lead between islands and rocks, bare and submerged. Caution is necessary at all times. Strangers should not attempt to enter or leave in thick weather. Wire drag examination has been made of all the channels in the harbor and their approaches, except the channels between the black buoy and the horizontal-striped lighted buoy northward of Little Haste through South Channel, and through Marblehead Harbor. Strangers should exercise caution in navigating through areas not examined by wire drag.

The greater part of Salem Harbor and the eastern part of Beverly Harbor are included in a **seaplane restricted area**; limits and regulations are given in **§ 207.7,** Chapter 2.

An extensive area of rocky patches and reefs extends 2 miles southeastward of Bakers Island, ending with **Newcomb Ledge** with 18 feet over it. A lighted whistle buoy is about 0.7 mile east-southeastward of the ledge. In this area are **Searle Rock, The Breaker** 1 mile southeastward of Baker Island, **Middle Breakers, Southeast Breakers,** and **Davis Ledge,** all charted and marked by buoys, and **Inner Breakers,** unmarked. Middle and Inner Breakers are partly bare at low water, and all break in heavy weather.

Hardy Shoal, of which **Hardy Rocks,** bare 4.5 feet at low water, and **Rising States Ledge,** with 7 feet over it, are a part, extends from 0.6 to 0.8 mile westward of Bakers Island Light. It is marked on its northeast, east, and western sides by buoys.

Bowditch Ledge, 1.2 miles west-northwestward of Bakers Island Light and 300 yards southward of the Main Ship Channel Range, is marked by a conical granite monument daybeacon which is very conspicuous when approaching the harbor. The extension of the ledge northeastward is marked by a buoy. **House Ledge,** with 10 feet over it, and **16-Foot Rock,** respectively, 0.4 mile eastward, and 0.2 mile southeastward of Bowditch Ledge,

are marked by buoys. **Powers Rock** on the northern end of Bakers Island Shoals is marked by a bell buoy. These dangers are all south of the main channel range line.

North of the main channel, a ledge extending southwestward from Little Misery Island, and **Misery Ledge,** are marked by buoys. A lighted buoy is southward of **John Ledge.**

Great Haste is a bare rock surrounded by ledges on the south side of the main channel, 2.4 miles westward of Bakers Island. **Little Haste,** close northwestward of Great Haste, is bare at low water and marked by a daybeacon. A 17-foot spot about 650 yards northward of the daybeacon is marked on the north side by a lighted buoy.

Popes Head, 300 yards northwestward of North Gooseberry, is a rugged, bare rock surrounded by ledges to a distance of 150 yards. A buoy marks **Popes Head Shoal** the western extremity of the ledges around the islet.

Satan Rock, 0.5 mile east-southeastward of Cat Island, is a small bare rock marked by a daybeacon. The rock should be given a berth of over 200 yards.

Brimbles is a rock awash at low water, 0.3 mile south-southeastward of Eagle Island. It is marked by a daybeacon, black spindle with four arms; the two arms toward Cat Island Channel have red faces. The daybeacon should be given a berth of over 200 yards.

Eagle Bar, an extensive foul ledge and shoal area extending from Eagle Island to the northward, eastward, and westward, and terminating with **Cutthroat Shoal,** on the northeast, and **Midchannel Rock** on the west, is marked on its extremities by three buoys.

Grays Rock, 0.7 mile northwestward of Cat Island, is about 10 feet high. **Chappel Ledge,** with a least depth of 16 feet, about 350 yards eastward of Grays Rock, is marked on its south side by a buoy. **Coney Ledge,** an extensive ledge extending southeastward from Coney Island, is marked at its easterly end by a buoy.

Islands and rocks, sunken and bare, extend 2 miles southward and southwestward from the south end of Marblehead Neck. Many of these dangers are marked by buoys, and the channels between them are used by local boats, but the area should be avoided by strangers. A lighted bell buoy marks the southeastern end of the broken ground.

Dangers showing above water are: **Great Pig Rocks,** bare at high water and having rocks awash at low water southward of them; **Sammy Rock,** bare at low water; **Ram Islet,** high, rocky, and grassy; **Little Pig Rocks,** awash at high water; **Roaring Bull,** bare at low water and marked by a daybeacon; and **Tinkers Island,** marked by several houses.

A bar with little depth, connects Tinkers Island with **Flying Point** the southern end of Marblehead Neck.

Tom Moore Rock, at the eastern end of a reef extending 500 yards eastward from the middle of Marblehead Neck, is bare at one-third ebb, and marked by a daybeacon.

No attempt has been made to describe all of the dangers, shoals, rocks, ledges, as all those known are charted. Most of those in or near the fairways, or near the channel edges, are marked. The chart should be the guide and due caution exercised. Important dangers within the limits of the three harbors will hereafter be described where necessary under the description of each individual harbor and its facilities.

Bridges.—Two swing bridges, 100 yards apart, the lower a highway, the upper a railroad, crossing the mouth of Danvers River from Beverly to Salem, have clearances of 4 feet. Operating regulations are given in § **203.65,** Chapter 2.

A highway swing bridge crossing Danvers River about 0.5 mile above the railroad bridge has a clearance of 8 feet. One crossing Bass River about 0.5 mile above the mouth has a clearance of 5 feet.

A highway swing bridge crossing South River has a clearance of 4 feet. This bridge is seldom used as there is no longer any traffic above the bridge.

Overhead power cables.—Overhead power cables crossing the mouth of North River have clearances of 75 feet, and where they cross Collins Cove, they have a clearance of 50 feet. The towers are conspicuous from seaward.

Tides and currents.—The mean range of tide is about 9 feet. The tidal current in Salem and Marblehead Harbors has little velocity. In Beverly Harbor it has considerable velocity, and sets across the channel in places. During the first half of the ebb the current sets across the shoal extending northeastward from Monument Bar.

See Appendix for **storm warning** displays.

Ice.—The head of Salem Harbor on the flats usually is closed by ice every winter during the months of January and February, but the formations rarely extend beyond the coal piers except in unusually severe winters, when they have been known to reach as far out as Great Haste, and occasionally as far as Eagle Island. Northerly and northwesterly winds are most favorable to local formation in Salem Harbor.

Winds from southward and westward, during light formations, have a tendency to carry the ice off to sea, while those from eastward usually break up the formation both in the harbor and its approaches.

Ice rarely obstructs Marblehead Harbor to such an extent as to become a hindrance to navigation. Fishermen have made it a refuge when it was impossible to get into Gloucester, Salem, or Lynn Harbors. The formation of ice in Marblehead is entirely local and it remains only a short time.

Pilotage is compulsory for foreign vessels and for vessels under United States registry in foreign trade. Pilotage for vessels in the coastwise trade is not compulsory, but deep-draft vessels usually take a pilot.

There are two pilots in the area, one residing in Salem, and the other in Marblehead. Arrangements for pilotage are made through Boston. They will meet vessels off the entrance to the main channel or in the vicinity of the lighted buoy off Newcomb Ledge.

Towage.—There are no tugs but they can be obtained from Boston. There are heavy duty work boats that do light towing and pass mooring lines.

Customs, quarantine, and immigration.—Primary ex-

amination for all three is usually made by the Custom Boarding Officer on arrival at the dock. If further quarantine and immigration procedures are necessary or indicated, arrangements are made at Boston. Salem is the **port of entry** for Manchester, Salem, Beverly, Danversport, Marblehead, and Lynn. Marine documents are issued.

Harbor regulations.—Moorings in the three harbors are under the supervision of their respective harbormasters. A **speed limit** of 5 miles per hour is enforced within the limits of the harbors by police patrol boats.

Wharves.—In 1959, oil storage terminals were in operation at Tuck Point at Beverly, South River, Salem, and at the head of navigation on the Crane River at Danversport. A coal unloading terminal is on the east side of Salem Neck. Other wharves were in ruins or various stages of disrepair and disuse. Several fish wharves in Beverly and Salem were in operation.

Supplies.—Diesel oil, coal, gasoline, fresh water, provisions, ice, and marine supplies can be obtained at the port, and ship chandlery is available.

Repairs.—There are machine shops at Beverly and Salem that can carry out repairs. There are no drydocks, the nearest one being at Boston. There are numerous yacht and boatyards which do repairs, haul out and store. The largest of the marine railways in the harbors, located at Salem, can haul out craft up to 120 feet in length, 100 tons in weight and 11-foot draft. Dry covered and open winter storage is available.

Communications.—All three ports have railway, bus, telephone, and telegraph communications.

Chart 241.—Beverly Harbor is north of Salem Neck at the western end of Salem Outer Harbor, and is formed by the confluence of Danvers River, Bass River (Beverly Creek), and North River. It forms the approach to the city of Beverly, a manufacturing and resort city on the north side of the harbor just inside the entrance. There is little trade by water save some fishing and an occasional oil tanker.

A channel with general depths of 22 to 24 feet, in 1959, leads to the oil storage plant at **Tuck Point**, the fish wharf, service wharf, and a marina on the north side below the highway bridge.

The harbor is used principally by small pleasure craft and some fishermen which lay to moorings either in the special small-vessel anchorage on Monument Bar, or south of the channel below and westward to the highway bridge. The harbor is patrolled and a speed limit of 5 miles per hour is enforced.

The channel is buoyed and the dangers are marked. Daybeacons mark Monument Bar and Lobster Rocks, both on the east side of the channel leading to **Collins Cove**. In 1959 the channel to Collins Cove was reported to have silted up and is seldom used. There are no activities in the cove.

Jubilee Yacht Club at Tuck Point, has 18 feet of water at its float landing. Gasoline and fresh water are piped to the floats of the club, and also to the service wharf and marina near the bridge. Marine railways and a travel lift that can haul out craft up to 45 feet in length for repairs or storage are available. Ramps and a public landing are also available on the waterfront.

Danvers River, the continuation of Beverly Harbor northwestward, has a depth of about 7 feet for 2 miles above Beverly to the town of **Danversport**. The bridges which cross the river have been described previously. In 1959 it was reported that coastal oil tankers drawing 14 feet occasionally go up to Danversport on the high-water to an oil storage plant on the north side of **Waters River**, a tributary of the Danvers, at a fixed highway bridge. There is no navigation above the bridge at Danversport.

Gasoline, diesel oil, and fresh water are piped to the float of a marina and yacht yard just below the oil plant. The yard has a marine railway that can haul out craft up to 42 feet in length for repairs for dry open or covered winter storage. Ice, provisions, yacht supplies, and most services are available, and overnight berthing with electricity and telephone service is available.

There are a number of other boat repair and storage yards on the **Porter River** and **Crane River**, also tributaries of the Danvers River, at Danversport. The largest of these at the head of navigation on Crane River, has a marine railway that can haul out craft up to 70 feet in length, and gasoline and fresh water is available also.

Hull and engine repairs, and open winter storage is available. A small yacht club is on Porter River where it joins the Crane River.

The channel is narrow and marked by buoys for 1.5 miles above Beverly. It leads between flats bare at low water and is difficult without local knowledge.

North River, a tributary of Beverly Harbor from southward just above the bridges, is nearly bare at low water in a narrow, unmarked channel which is seldom used. A boatyard with a marine railway that can haul out craft up to 40 feet in length for repairs or winter storage is on the west side of the river just below the bridge at the head of navigation.

Bass River (Beverly Creek), a tributary of Beverly Harbor from northward just above the bridges, has a dredged channel 6 feet deep for about 1 mile above the entrance. The channel leads between flats bare at low water and is most easily followed at that stage. The channel is marked by buoys to the bridge which has been described previously.

A boat building and repair yard and a yacht club, both with marine railways, and a ramp, the latter just above the bridge, are all on the east side of the river. There are no services, except a service station near the ramp.

Salem Harbor is about 1.5 miles in length in a southwesterly direction. **Salem**, an industrial city, is on the western side of the harbor. The principal industries are leather, electronic products, and games manufacturing. The city has many points of historical interest, including two museums devoted to maritime subjects.

The approach to Salem Harbor is in a west-southwesterly direction from the main channel westward of the

lighted buoy 0.4 mile northwestward of Great Haste. The channel then takes a more southwesterly direction past an unmarked obstruction cleared to a depth of 27 feet.

On the western side of the approach is Salem Neck. **Salem Willows Park,** the yacht club, and public pier are on the northeastern extremity of the neck. Excursion and party fishing boats operate from the float landing here in summer. Rowboats can also be hired. **Juniper Point,** the eastern extremity of the neck, has many summer homes.

Juniper Cove, a shallow foul cove which is mostly dry at low water, lies between Salem Neck and **Winter Island.** A boat and yacht yard with marine railway is at the head of the cove. In summer, small craft moor in the entrance to the cove between **Abbott Rock** and Juniper Point. The cove is open to easterly weather but the holding ground in the entrance is reported to be good.

Fort Pickering Light, 28 feet above the water and visible 10 miles, is shown from a red conical tower on a concrete foundation with a gray bridge to the shore, located on the southeastern point of Winter Island. The hangars, buildings, and seaplane ramps of the Coast Guard search and rescue base on the southern half of Winter Island are conspicuous.

The entrance to the harbor is between **Abbott Rock Daybeacon** and Fort Pickering Light on the west and **Great Aquavitae Shoal** on the east. The shoal is marked by a daybeacon and buoys.

A Federal project for Salem Harbor provides for an entrance channel 32 feet deep from deepwater in the outer harbor to a junction with an approach channel, leading to the Salem Terminal Wharf, southwestward of **Cat Cove.** In 1959, the controlling depth in the entrance and approach channels was 32 feet, and the same depth was reported alongside the wharf.

The transporters, coal pile, and oil tanks of the Salem Terminal are most conspicuous, as are the three stacks of the power plant adjacent to the north.

From near is junction with the terminal channel, the harbor channel continues in a south-southwesterly direction for about 0.4 mile with depths of 16 to 20 feet. From there a channel dredged to 10 feet but in 1959 reported shoaled to 6 and 7 feet, and marked by buoys, leads just west of Derby Wharf to South River. **Derby Wharf,** with only 2 or 3 feet alongside, is no longer used.

South River, a short estuary extending into the city of Salem, has its entrance on the west side of Derby Wharf, which is a long stone jetty. **Derby Wharf Light,** 25 feet above the water, is shown from a white square tower on the outer end of the jetty. Derby Wharf and the Old Customhouse are part of the National Park Service. The Naval Reserve Training Center is on Pickering Wharf next adjacent to the west.

On the west side of South River, large industrial buildings and warehouses and a brick stack are conspicuous.

At high water, coastal tankers and oil barges drawing up to 14 feet go up to an oil storage plant on the north side of the channel opposite Pickering Wharf. In 1959 it was reported that local small craft could carry 6 feet as far as the public float landing and a marina on the east side of the Congress Street Bridge, about 0.2 mile above Derby Wharf. The bridge has been described previously. There is no traffic above the bridge.

The ferry to Bakers Island leaves from the public landing at the bridge. Gasoline, diesel oil, fresh water, ice, provisions, and most services can be obtained at the marina's float landings.

The southwestern part of Salem Harbor is shoal, and at the head particularly foul, southward of Pickering Point.

There is a yacht club and yacht yard in **Palmer Cove.** Fresh water is piped to the floats which have 6 to 8 feet alongside. A hard-surfaced ramp is at the yacht club. No gasoline is available.

South of **Palmer Point** a large yacht yard and marina has a marine railway, the largest in the area, that can haul out craft up to 120 feet in length and 100 tons. Fresh water, open and covered winter storage, a 20-ton crane, and most services are available at the yard. The yard maintains moorings.

Marblehead Harbor is about 1 mile long and 700 yards wide. It is formed on the east and south by Marblehead Neck and **Marblehead (Devereux) Beach,** a narrow strip of land connecting the south end of the neck with the mainland. Marblehead Light, previously described, marks the easterly point of the entrance. Marblehead Harbor is an excellent anchorage and is mostly used by yachts during the summer. The anchorage is reported uncomfortable for small yachts when the wind is northeast.

The depths in the harbor up to **Skinner Head** are from 21 to 30 feet with the exception on the east side, northerly of **Boden Point,** where **Boden Rocks,** with 9 feet over them, are marked by a buoy on the north side.

Southward of Skinner Head, on which there is a large wooden summer hotel, the depths shoal gradually, with 8 feet available to within about 300 yards of the head and east side. It is reported that this part of the harbor is extremely uncomfortable for small craft during a northeaster.

The harbor is somewhat congested during the summer, and in 1959, the harbormaster estimated that on an average 1,000 moorings usually are occupied, with a peak of 2,000 craft of all sizes and types in the harbor during race week in August.

The moorings are under the supervision and control of the **harbormaster** who issues permits for them. The harbor is patrolled by a police boat and a **speed limit** of 5 miles per hour is enforced. The harbormaster may be contacted through any of the yacht clubs, yacht yards, or service facilities, and may on request, direct a stranger to a mooring or a quiet spot for anchoring. Guest moorings are maintained by most of the yacht clubs, yards, and service facilities.

No directions are deemed necessary for entering. The chart should be the guide. All known dangers are charted, and most of them are marked. Some difficulty may be experienced, once in the harbor, in finding a mooring or good swinging room, if the harbor is congested. In that case, the harbormaster may be of help.

There are numerous float landings on both sides of the harbor, some private, some public, at which there are depths of from 6 to 25 feet. Overnight berthing, as a rule, is not permitted at any of the service or yacht club floats.

Marblehead, a combined business and residential community on the west side, and **Marblehead Neck,** purely residential, on the east side of the harbor, are important summer resorts, offering a diversity of interests to the visitor.

See Appendix for **storm warning** display.

There are eight yacht clubs on the harbor, three on the east side, and the remainder along the west side. All have facilities to a varying degree, either private, or available to visiting yachtsmen.

There are three service facilities with float landings on the west side at which gasoline, diesel oil, fresh water, ice, provisions, and most yacht supplies can be furnished, or obtained. Ship chandlery is available at the facilities, or in the town.

Three yacht yards, one on the west side, and two in Little Harbor, northwestward of **Fort Sewall,** have marine railways, the largest of which can haul out craft up to 78 feet in length. Complete hull or engine repairs can be made and dry, open or covered winter storage is available at all of the yards. Electric or electronic repairs can also be made.

Wood and steel, sail or motor craft up to 83 feet in length can be built at Marblehead.

There are two public float landings and two ramps for launching small craft.

Lodging, restaurants, markets, hospital, and churches are available in Marblehead, and railroad, bus, telephone, and telephone communications are available.

Chart 240.—Phillips Point (Littles Point), 3.5 miles southwestward of Marblehead Light, is high and rocky, and its western and higher part is wooded. A rock with 12 feet over it is 600 yards eastward of **Grass Head,** the eastern end of the point. A reef with bare heads extends 350 yards southward from Phillips Point. **Dread Ledge,** 500 yards southward of the point, is bare at half tide and marked by a daybeacon.

Nahant Bay is 2 miles wide between Phillips Point and Nahant. Temporary anchorage, exposed to easterly and southerly winds, can be had in the bay in 18 to 36 feet, but is seldom used. The usual anchorage is off Swampscott, southwestward or westward of the southern end of Fishing Point. Small craft can anchor westward of the point in 7 to 10 feet. In the cove westward of Fishing Point, off what is known locally as **Fishermans Beach,** a small anchorage basin for local fishing and pleasure craft, has been dredged to a depth of 5 feet. There is a yacht club on the beach, and a **harbormaster** supervises the moorings.

There is a public small-boat ramp with parking space adjoining it on both sides. Gasoline can be obtained in cans from a nearby service station. Ice, provisions, and supplies are available from the nearby markets and stores. Rowboats and outboards can be hired, and bait and tackle can be obtained.

The bay is clear, and 18 feet is found about 0.5 mile from its northwest side, shoaling thence to the shore. **Fishing (Lincoln House) Point, Blaney Rock,** and **Red Rock** are rocky points on the northern side of Nahant Bay. A rock with 3 feet over it is about 125 yards south of the end of Fishing Point. A buoy marks the south side of the rock.

The town of **Swampscott** is on the northern shore of Nahant Bay. A large standpipe, the high school cupola, and the Oceanhouse Hotel are conspicuous. A church spire, lighted at night, is on the shore drive at Red Rock.

Lynn Beach is a narrow strip of sand about 1 mile long in a southerly direction separating Nahant Bay from Lynn Harbor. **Little Nahant,** a high grassy head with many houses, is joined to Nahant by **Little Nahant Beach,** a strip of beach 0.4 mile long. The Coast Guard station on Little Nahant Beach is just southward of Little Nahant. The white buildings and a steel signal tower are conspicuous. See Appendix for **storm warning** display.

Egg Rock, 60 feet high, is on the southern side of the entrance to Nahant Bay. It is a bird sanctuary.

Nahant is a high peninsula about 1.5 miles long, with bluff seaward faces. The town of Nahant is connected to Lynn by a highway. Among the most prominent objects are: a stone house, two church spires, one with a clock tower, two concrete observation towers on **East Point** and another similar tower on **Bayley Hill.** On the 60-foot gray concrete tower, of the two on East Point, there is a Coast Guard **radio direction-finder calibration station;** see **light list** for details of operation.

Nahant Harbor is the bight on the south side of Nahant. On entering between **Joe Beach Ledge** lighted buoy and **Bass Rock** daybeacon, select temporary anchorage off the wharf in 18 to 24 feet, hard bottom. The town wharf has about 5 feet alongside a float landing; a hard-surface launching ramp for small boats is on the north side of the shore end of the wharf. Fresh water is piped to the float, rowboats can be hired, and bait and tackle can be obtained. There is a sailing club on the wharf, and a **harbormaster** controls the moorings.

Just northward of **Bass Point,** on the west side of Nahant, there is a yacht yard and marina with a marine railway that can haul out craft up to 75 feet in length for repairs or dry, open winter storage. Gasoline and fresh water are piped to the pier and float landing, which has 3 to 4 feet alongside. Party boats operate from the pier in summer. Rowboats and outboards can be hired, and bait and tackle can be had.

A yacht club, restaurant, and hotel close northward of the yard have various services available to guests.

Broad Sound, about 4 miles wide, between Nahant on the northeast and Deer Island on the southwest, forms the approach to Nahant and the city of Lynn at its north end, and the northern approach to Boston Harbor at its south end. It has depths of 18 to 48 feet in the entrance, but is shoal near the shores.

Shag Rocks are bare rocks extending 300 yards south-

ward from the southeast end of Nahant. A ledge, awash at lowest tides, extends 100 yards southward from the southernmost Shag Rock. A buoy is south of the ledge.

Lynn Harbor, the northerly end of Broad Sound, is full of shoals, largely bare at low water, through which a channel has been dredged to the city of Lynn. **Lynn,** an industrial community of major importance, in 1959, had little waterborne commerce. Of over 100 diversified industries, shoemaking is the most important, and there is a large General Electric plant, which manufactures airplane engines and electronic products. Depths at the wharves vary from 5 to 20 feet; but in 1959, those in good condition were not in general use; the others were in ruins, or in a general state of disrepair.

Landmarks in approaching Lynn Harbor are the standpipe on Winthrop Head, the three observation towers and the church spires at Nahant, the senic railway and ferris wheels at Revere Beach, the coal unloader, large gas storage tanks and twin chimneys of the power plant, several stacks at the head of the harbor, a tall brick stack at the General Electric plant, the radio tower of Station WORL on the Pines River, and the twin towers of the municipal bath house near the northern end of Lynn Beach.

A channel dredged to 22 feet leads from Broad Sound, at a point about 0.8 miles westward of Bass Point, to a turning basin at the head of the harbor. A subsidiary channel leads from the basin in a southwesterly direction to the wharf of the power plant.

In 1959 it was reported locally that considerable shoaling and narrowing of the channels had occurred and that there were general depths of 17 to 20 feet in the channel and turning basin. The channel is marked by buoys and lights.

With due attention to the chart, and by following the aids, on a midchannel course, no difficulty should be experienced in entering the harbor. Some local knowledge, or assistance, will be needed in finding swinging room, or a vacant mooring off the yacht clubs at the head of the harbor, as this area is usually heavily congested with small craft.

Many small craft moor on the east side of the harbor near Bass Point, and the boatyard there maintains about 150 moorings, with usually a few vacant.

Black Rock Channel, a branch of the easterly channel leading along the western side of Nahant, is unmarked and suitable only for small craft. Shoals nearly bare at low water are on each side. In 1959, it was reported locally that the channel had shoaled to 5 feet and could be used only by small craft.

Western Channel of Lynn Harbor leads to General Edwards Bridge and the Saugus River. Controlling depth in Saugus River from the General Edwards Bridge to the General Electric Company wharf, 0.5 mile upstream, and on to Foxhall Bridge, was reported to be about 9 feet. In December 1953, a channel 8 feet deep and 60 feet wide was dredged 0.75 mile upstream from Foxhall Bridge to a turning basin off the Saugus River Yacht Club. In 1959, it was reported locally that this channel had shoaled in places to 3 feet and a like depth in the turning basin.

Western Channel is marked by buoys as far as the first bridge at the mouth of the Saugus River, and from there on it is unmarked, and local information is essential.

Anchorages.—Small craft moor off the marina and boatyard north of Bass Point, in the turning basin at the head of Lynn Harbor, and the special small-vessel anchorage eastward of it; limits and regulations are given in **§ 202.1** and **§ 202.30(a)**, Chapter 2. In Saugus River, some moor off the yacht club close eastward of General Edwards Bridge where an anchorage basin was dredged to a depth of 8 feet in 1959. Above the bridge they moor on the west side of the channel, and above Foxhall Bridge in the channel where space permits. In Pines River they moor in the narrow channel. Moorings are under control and supervision of the **harbormaster.** Depths in the anchorages are: off Bass Point from 5 to 30 feet; at the head of Lynn Harbor from 7 to 17 feet; and in Saugus and Pines Rivers from 3 to 9 feet.

Dangers.—The only dangers in the approach to Lynn Harbor are Flip Rock and Nahant Rock. **Flip Rock,** with 12 feet over it and marked by a gong buoy, is 0.6 mile south of Bass Rock. **Nahant Rock,** with 18 feet over it and marked by a buoy, is 0.8 mile south-southwest of Bass Point.

Bridges.—No bridges cross the main channel to Lynn. Three bascule bridges cross Saugus River between the mouth and a fixed highway bridge at East Saugus, about 2.5 miles above the mouth. The first, General Edwards Bridge, has a clearance of 27 feet.

The second, the Boston and Maine Railroad bridge, has a clearance of 7 feet, and the third, Foxhall Bridge, at Western Avenue, has a clearance of 6 feet. The fixed highway bridge at East Saugus has a clearance of about 4 feet, but it is reported that a water main crossing under the bridge obstructs the channel at low water and prevents navigation through it. Small craft are reported to go above the bridge for some distance at high water.

The drawspan of a former narrow gauge railroad bridge, just above General Edwards Bridge, has been removed to the approach piers for a channel width of 200 feet. The southern approach pier, with two float landings alongside it, is used as a service wharf by the marina at the mouth of Pines River.

Tides and currents.—The mean range of the tide is about 9.2 feet at Lynn. The average strength of current at Lynn Harbor entrance is 0.5 knot.

Pilotage is compulsory for foreign vessels only. A pilot may be obtained from the Boston Pilot Boat.

Towage is done by tugs from Boston. There is a small tug with salvage equipment, a qualified deep-sea diver, and a 10-ton floating crane at the boatyard on the west side at the head of Lynn Harbor.

Quarantine.—There is no quarantine station. Medical inspection is performed by U.S. Public Health Service officials from Boston upon notification from Salem.

Customs.—Business is transacted through the customs office at Salem.

Immigration.—The immigration service at Boston is notified by ship's agents if required, through the Salem customs.

Harbormasters.—There is a harbormaster at Lynn and one at Saugus. The former can be contacted through the yacht clubs; the latter is at the boatyard and yacht club at Greens Landing, at the south end of Foxhall Bridge. They supervise and control the moorings.

Wharves.—In 1959, the only wharves in periodic use were those of the coal and oil unloading terminal of Lynn Gas and Electric Company on the west side of Lynn Harbor, and the General Electric plant on Saugus River. The former had depths of 20 to 22 feet alongside and only an occasional oil barge unloaded there. Coal is shipped in by truck from Salem. The General Electric Company wharf had 9 feet alongside and was used only occasionally.

Small craft facilities.—There are two yacht clubs at the head of Lynn Harbor, one at **Point of Pines,** and two on Saugus River. All have 8 to 10 feet alongside their float landings with the exception of the upper one on Saugus River which has 3 feet. All the clubs maintain guest moorings.

There are marinas at Bass Point, two at Lynn and one on Saugus River at the north end of Foxhall Bridge, and two on Pines River, one at the mouth and one about 0.8 mile above the mouth on the east bank. All supply gasoline and most services to small craft. They all have ramps for launching small craft. Another public ramp is on the west bank of Saugus River about 400 yards above Foxhall Bridge.

Supplies.—Gasoline, diesel oil, ice, provisions, bottled gas, coal, yacht and marine supplies, and hardware can be obtained at the marinas, at two of the boatyards and yacht clubs, or in town. There are no facilities for bunkering large vessels. Lodging, restaurants, and markets are in the city and ship chandlery is available.

Repairs.—There are boat repair and storage yards at Bass Point, Lynn, and on the Saugus and Pines Rivers. Most of them are equipped with marine railways, the largest of which can haul out craft up to 60 feet in length and 60 tons in weight for hull or engine repairs, or dry, covered or open winter storage. The yard on the Pines River can build diesel motored craft up to 47 feet in length.

There are machine shops in the city but the nearest drydock and yards for major repairs to large vessels are at Boston.

Lynn has railway, bus, telephone, and telegraph communications, a hospital, hotels, banks, churches, and many other conveniences.

Revere is a city and summer beach resort on the west side of Broad Sound. At the southern end of **Revere Beach** a breakwater extends out from the shore on **Cherry Island Bar,** forming an anchorage for small craft in 3 to 4 feet of water. It is exposed and in 1959 few small craft were observed to be moored there. Parts of the breakwater are covered at high water.

Westward of the breakwater a long pier with a float landing at the end with 2 to 3 feet alongside makes out from the shore for about 250 yards in a northeasterly direction. Outboards and rowboats can be hired and small amounts of gasoline are available. There is a snack bar on the pier. The pier is also an air station for skin divers. There are sunken piles off the landing.

Near the northern end of Revere Beach, a rocky ledge, bare or almost bare, is reported to make out in an east-southeasterly direction for about 0.5 mile, from the vicinity of a large red-roofed house on the beach front. A stake marks the outer end of the ledge.

11. BOSTON HARBOR, MASSACHUSETTS

Chart 246.—Boston Harbor, the largest seaport in New England, includes all the tidewater lying within a line from the southern extremity of Deer Island to Point Allerton, about 4 miles to the southeastward. Numerous dangers lie in the approaches to the harbor. The northeastern approach is obstructed by islands and shoals which extend 4 miles from the entrance; between them are the dredged channels which lead into the harbor. In the southeastern approach, broken ground extends as much as 3 miles from shore. The approaches are marked by a number of powerful lights, and the principal dangers are buoyed.

Prominent features.—Boston Lightship (42°20.4′ N., 70°45.5′ W.) is moored about 9 miles eastward of Deer Island. The vessel has a red hull with the name BOSTON in large white letters on the sides. A light, 65 feet above the water, is shown from the foremast. The radiobeacon and the fog signal are synchronized for distance finding.

Conspicuous to a vessel approaching Boston Harbor from northeastward is the tall standpipe on Winthrop Head. From eastward, the most prominent island in the entrance is Great Brewtser. On the south side of the entrance, a turreted tower is conspicuous on Nantasket Hill; also prominent are the tank and standpipe on Strawberry Hill. Two miles south of Point Allerton are two radio towers which are illuminated at night.

The outstanding landmarks in the city are the John Hancock Building, the bridge over Mystic River, the tower of the Customhouse, and a large gas tank in Chelsea. Also prominent are a grain elevator in East Boston, the Federal Office Building in Boston, a gas tank on Commercial Point in Dorchester, and a water tank at Squantum.

Boundary lines of inland waters.—The lines established for Massachusetts Bay are described in **§ 82.10,** Chapter 2.

Northeastern approach.—Deer Island, on the northwest side of the entrance to Boston Harbor, is about a mile long and is joined to the mainland by a fill. There is a prison on the northern part of the island, and a sewage pumping station, with a prominent stack, is on the southwest side.

Deer Island Light (42°20.4′ N., 70°57.3′ W.), 53 feet above the water, is shown from a brown conical tower, on black cylindrical pier, on the outer end of a ledge that extends 0.3 mile southward from the island. A fog signal is sounded from the light station.

Winthrop Head, about a mile northward of the northwestern end of Deer Island, is a 100-foot hill covered with buildings and with a tall standpipe on it which is the most prominent mark in the vicinity. The town of **Winthrop Beach** lies along the shore just northward of Winthrop Head. About 0.2 mile off and parallel to Winthrop Beach is a breakwater about 0.4 mile long which is bare several feet at the highest tides and is fairly prominent.

Great Faun Bar, the inner part of the shoal ground extending from the northeastern side of Deer Island, is a partly drying flat, marked on its outer part by a daybeacon which is about a mile northeastward of Deer Island Light and 0.3 mile northwestward of Boston North Channel. **Little Faun Bar,** which dries on its inner part, extends 0.5 mile eastward from the southern end of Deer Island.

A naval **restricted area** is centered about a mile northeastward of Deer Island; see **§ 207.8,** Chapter 2, for limits and regulations.

Finns Ledge, with least depths of 25 to 29 feet over it, lies on the western side of the entrance to Boston North Channel, the principal approach to the harbor. The ledge, which is marked by a lighted buoy, is at the outer end of shoal ground, with depths of less than 36 feet over it, which extends about 2 miles northeastward from Deer Island. Careful navigation is required in the channel entrance, especially when incoming and outgoing vessels meet.

The Graves, a group of bare rocks and ledges about 4 miles east-northeastward of the southern point of Deer Island, extend 0.35 mile north-northeastward and 0.1 mile south-southwestward from The Graves Light. **Northeast Grave,** the northernmost of these rocks, uncovers 3 feet and from it shoal ground extends about 0.3 mile northeastward; a lighted buoy is moored 0.8 mile north-northeastward of Northeast Grave. **The Graves Light (42°21.9′ N., 70°52.2′ W.),** 98 feet above the water, is shown from a light gray conical granite tower; a fog signal is sounded from the light station.

Roaring Bulls, which partly dry, are a group of rocks which lie from 0.5 to 0.9 mile southwestward of The Graves Light; the highest rocks uncover about 8 feet.

Green Island, 44 feet high, is 1.2 miles southwestward of The Graves Light and 0.4 mile west-southwestward of the Roaring Bulls. The island is on a drying reef, with several islets on it, extending 0.3 mile southwestward from the island.

Commissioners Ledge, Devils Back, and **Aldridge Ledge** lie 0.5 to 1.0 mile westward of Green Island and close southeastward of Boston South Channel; Devils Back has a depth of 1 foot over its northeast end. Between these ledges and Green Island are **Maffit Ledge,** covered 17 feet, and **Halftide Rocks,** which uncover 4 feet.

Between Boston South Channel and Boston North Channel is a large area of shoal ground. The shoalest

spot in this area has a depth of 8 feet over it and lies 1.3 miles east-northeastward of Deer Island Light.

Southeastern approach.—Point Allerton, on the southeast side of the entrance to Boston Harbor, is 3.7 miles from the southern end of Deer Island. On the point is a 100-foot grassy hill covered with buildings; a seawall protects the seaward base of the hill.

From Point Allerton the shore extends westward for 2 miles to **Windmill Point,** which is marked by a light and fog signal. The Coast Guard has boathouses on Point Allerton and Windmill Point, and **Point Allerton Coast Guard Station** is about halfway between the two points. **Nantasket Hill,** a mile west of Point Allerton, is about 100 feet high and is marked by a stone tower; the town of **Hull** is on the western slopes of the hill.

Nantasket Beach, extending about 3 miles south-southeastward from Point Allerton, is covered with buildings. Grassy **Strawberry Hill,** 1.2 miles southward of Point Allerton, is about 100 feet high and is marked by a tank and a standpipe. Two other grassy hills, **White Head,** with a low brick stack near it, and **Sagamore Head,** are situated on the southern part of the beach 2.0 and 2.4 miles respectively from Point Allerton. From Nantasket Beach to Cohasset Harbor, about 3 miles to the east-southeastward, the coast presents a generally hilly appearance, and rocks and sunken ledges extend 0.5 mile offshore in places.

Shoals extend eastward and northward from Point Allerton. Two drying rocks, about 0.1 mile apart, lie about 0.2 mile northward of the point; the eastern rock uncovers 5 feet. A lighted buoy is moored about 0.5 mile northward of the point. **Ultonia Ledge,** the eastern end of the broken ground, has unmarked spots with depths of 15 to 24 feet over them extending 1.3 miles east-northeastward from the point.

Harding Ledge, 1.5 miles eastward of Point Allerton, bares before low water and is marked by a daybeacon. A detached rock which uncovers 1 foot is 0.2 mile southwest of the daybeacon. Between Harding Ledge and Point Allerton the bottom is very uneven and vessels should therefore pass outside the lighted buoy which is moored 0.3 mile northeast of the ledge.

Thieves Ledge, 2.4 miles east-northeastward of Point Allerton, has a least depth of 27 feet over it and is marked on its northeast side by a lighted buoy. A 32-foot patch and a 34-foot patch are 0.5 mile east-northeastward and 1 mile east-southeastward, respectively, of the 27-foot spot. In heavy easterly gales the sea sometimes breaks on the ledge and the patches.

Three and One-half Fathom Ledge, with a least depth of 20 feet, lies about 3 miles northeastward of Point Allerton and is marked by a buoy. **Martin Ledge,** with a least depth of 14 feet, is 0.8 mile southwest of Three and One-half Fathom Ledge and is marked on its eastern side by a buoy. **Boston Ledge,** covered 18 feet, is 1.4 miles southwest of Three and One-half Fathom Ledge and is marked by a buoy.

Shag Rocks, 1.2 miles northward of Point Allerton and 0.3 to 0.6 mile east-northeastward of Boston Light, are above water and are surrounded by extensive submerged ledges and foul ground. Reefs and foul ground extend 0.5 mile east-northeastward to within 0.2 mile of Boston Ledge and west-southwestward to within 0.2 mile of Boston Light.

Nash Rock Shoal, with a depth of 19 feet over it, lies about 0.4 mile southwest of Boston Light and is marked by a buoy.

Boston Light (42°19.7′ N., 70°53.4′ W.), 102 feet above the water, is shown from a white conical tower, 89 feet high, on the southeast side of **Little Brewster Island,** situated about a mile northward of Point Allerton. A fog signal is sounded from the light station. An auxiliary light, 34 feet above the water, is shown from a white structure 13 yards southwest of the main light.

Great Brewster Island, 0.4 mile northwest of Little Brewster, is 103 feet high and has a bluff at the north end. Little Brewster and Great Brewster lie on the northern side of the southeastern approach on a drying bank, of which **Great Brewster Spit,** the western part, extends about a mile west-southwestward from Great Brewster Island. The western end of the spit is marked by **Narrows Light,** which has a fog signal. Shoal ground extends about 0.3 mile southward from Great Brewster Spit, and on this extension are **Kelp Ledges,** which partly dry, lying about 0.8 mile westward of Boston Light.

From the northern end of the bank on which Great Brewster lies, reefs extend about a mile east-northeastward and 0.7 mile northward; on the eastern extension are **Middle Brewster Island** and **Outer Brewster Island,** and on the northern extension are **Calf Island** and **Little Calf Island.** On these reefs are several islets, and off-lying them are numerous shoals, the area between the Brewsters and Shag Rocks being particularly foul. Among these dangers is **Tewksbury Rock,** covered 9 feet, which is about midway between Outer Brewster Island and Martin Ledge.

Georges Island is about 2 miles west-southwestward of Boston Light and a mile north-northwestward across Nantasket Roads from Windmill Point. The island is the site of historic **Fort Warren** and has several other buildings on it. There is a wharf on the west side of Georges Island.

Lovell Island is 0.3 mile northward across The Narrows from Georges Island and is on the south side of Boston South Channel. The island has several buildings on it, and there is one good wharf on the west side near the southern end; another wharf, 0.3 mile northwestward of the first, is in ruins. **Ram Head Flats** and **Ram Head** extend up to 0.8 mile northeastward from the island; Ram Head partly dries.

Gallups Island, 0.3 mile northwestward of Georges Island and the same distance westward across The Narrows from Lovell Island, is high and grassy on its northern side. The island is marked by a red brick building, and there is a wharf, protected by a breakwater, on the southwest side. A reef named **Nixes Mate** lies on the outer part of the shoal ground which extends 0.4 mile northwestward from Gallups Island; near the center of the reef is a low islet marked by a daybeacon.

Long Island, 0.6 mile westward of Gallups Island and 0.8 mile southward across President Roads from Deer Island, is 1.5 miles long in a northeast-southwest direction and has a greatest width of about 0.25 mile. **Long Island Head Light (42°19.8′ N., 70°57.5′ W.),** 120 feet above the water, is shown from a white brick tower on the north end of the island. There is a large hospital with a conspicuous gilded dome on Long Island, and a tall brick stack is prominent. The island has two wharves on the northwest side.

Spectacle Island, on the south side of President Roads and 1.4 miles westward of Long Island, consists of two hills separated by a low valley. There is a garbage wharf in the bight on the west side of the island. The concrete stack near the wharf is prominent.

Channels.—There are three main channels of entrance from the sea to President Roads. Several other channels of less importance are used by local vessels.

Boston North Channel leads from Broad Sound to President Roads from northeastward. It is the principal entrance to Boston Harbor. The eastern 900 feet width of the channel has been dredged to 40 feet and the western 600 feet to 35 feet. The channel is well marked by lighted buoys.

Boston South Channel leads from Broad Sound in a southwesterly and westerly direction to President Roads. It has been dredged to 30 feet. The channel is marked by unlighted buoys.

Pilots of deep-draft vessels use the North Channel most of the time. The South Channel is rarely, if ever, used because deep-draft vessels have a tendency to feel the bottom, making steering difficult.

President Roads, between Deer Island and Governors Island Flats, has depths of 30 to 60 feet. The north part of it is used as a quarantine anchorage.

Nantasket Roads, westward of the southern entrance to The Narrows, is a good anchorage with depths up to 60 feet. There are several shoals in it with a least depth of 29 feet that must be avoided by deep-draft vessels.

The Narrows is the channel that leads into President Roads from southeastward between Boston Light and Lovell Island on the northeast, and Point Allerton, Georges Island, and Gallups Island on the southwest. It has been dredged to 27 feet. Shoals with depths of 18 to 23 feet are in the southeastern approach to The Narrows. The channel is well marked.

Due to the strong currents and sharp turns it is necessary to con a ship by eye through the approaches and in The Narrows channel. The navigator must take precautions to prevent being set off course by crosscurrents sweeping in or out of Black Rock Channel and the channel between Gallups Island and Georges Island.

Hypocrite Channel is a natural channel leading between Green Island on the north and Little Calf Island on the south. The greatest draft that can be carried through it to Boston South Channel is about 18 feet. The channel has several unmarked dangers and it is not recommended for strangers or for large vessels.

Black Rock Channel leads into The Narrows from eastward between Great Brewster Spit and Lovell Island. There is an unmarked ledge with a least depth of 8 feet nearly in midchannel. The channel is used only by small local craft and is not recommended for strangers.

A channel 250 yards wide leads into The Narrows from westward between Georges Island and Gallups Island. A light is on the north side of the channel near the end of the shoal off the southeast end of Gallups Island. The channel is suitable only for quick-working vessels on account of the sharp turn into The Narrows.

Nubble Channel leads from Nantasket Roads to President Roads between Nixes Mate and Long Island. It has been dredged to 15 feet. The channel is marked by buoys and a directional light shown from the structure of Deer Island Light.

Sculpin Ledge Channel leads between Long Island and Spectacle Island. It will accommodate vessels of about 8-foot draft to Hingham Bay by the passage southward of Peddocks Island. The deeper water favors Long Island, and in coming from President Roads the island should be followed at a distance of about 400 yards until up with the buoy easterly of Sculpin Ledge. Pass close eastward of the buoy, and round the southwesterly end of Long Island at a distance of about 300 yards.

The channel leading from Nantasket Roads to Boston, southward of Long Island and Spectacle Island, is partially marked by buoys, and can be used by boats of 8-foot draft with the aid of the chart.

Boston Main Channel extends along the southern side of President Roads to the mouths of the Chelsea and Mystic Rivers, and to Charlestown Bridge on the Charles River. The channel has been dredged to 35 feet. It has been deepened to 40 feet for a 600-foot width from President Roads to the mouth of the Mystic River with a widening at the bend just northerly of Commonwealth Pier No. 5, South Boston.

Anchorages.—General, explosive, and special anchorage areas have been designated in Boston Harbor; see **§ 202.1, § 202.30,** and **§ 202.134,** Chapter 2, for limits and regulations.

The anchorage on the north side of President Roads is the most commonly used general anchorage in Boston Harbor. The anchorage in Nantasket Roads, westward of the southern entrance to The Narrows, is good with depths up to 60 feet. On the westerly side of Georges Island the depths range from 21 to 36 feet, and better bottom and shelter will be found here in easterly winds. This anchorage is frequently used by vessels seeking shelter in easterly gales.

Tides.—The mean range of tide is about 9 feet at the entrance to Boston Harbor and about 9.5 feet at Boston and Charlestown. Daily predictions for Boston, Commonwealth Pier No. 5, are given in the Tide Tables.

Currents.—Daily predictions of the times of slack water and the times and velocities of strength of flood and ebb off Deer Island Light are included in the Tidal Current Tables.

The Tidal Current Charts for Boston Harbor show the direction and velocity of the tidal current for each hour

of the current at Deer Island Light. They present a comprehensive view of the tidal current movement for the harbor as a whole and also supply a means of readily determining for any time the direction and velocity of the current at various localities throughout the harbor.

For some distance northwestward of Cape Cod the tidal currents have a slight set onto Cape Cod Bay on the flood and out of the bay on the ebb. Along the north shore of Massachusetts Bay the flood sets in a general southwesterly direction and the ebb in a northeasterly direction. The velocity of the currents is influenced greatly by the force and direction of the wind. Off the entrance to Boston Harbor, the flood sets westward and the ebb eastward, increasing slightly in velocity as the entrance is approached.

The currents at Boston Lightship are described in Chapter 3.

In Broad Sound the velocity of the current at strength in most places is less than 0.8 knot. This increases to about 1 knot or more on approaching the entrances of the channels leading into Boston Harbor.

In Boston South Channel, north of Ram Head, the velocity at strength is almost 2 knots. In the channel between Deer Island Light and Long Island Head the velocity at strength is nearly 2 knots. In Hypocrite Channel the velocity at strength is a little over 1 knot. In Black Rock Channel the velocity at strength is between 1 and 1.5 knots. The flood sets southwestward through the channel and the ebb northeastward. This should be kept in mind when passing through The Narrows.

Near the middle of the channel between Boston Light and Point Allerton the velocity at strength is about 1.5 knots. On the northern side of the channel southward of Great Brewster Spit the velocity is about half as great. In the middle of the channel in Nantasket Roads the velocity at strength is about 1.5 knots. In Nantasket Gut the velocity at strength is about 2.5 knots.

Between Georges Island and Gallups Island the velocity at strength is about 0.7 knot. The flood sets westward and the ebb northeastward.

Between Gallups Island and Long Island Head the velocity at strength is about 1 knot. The flood current sets southward to southwestward and the ebb in the opposite directions.

Between Moon Head and Long Island, the current is rotary, turning counterclockwise. The average velocity at strength is about 0.2 knot. Usually strength of flood sets southwestward and strength of ebb eastward. Between Thompson Island and Spectacle Island the velocity at strength is about 0.5 knot. The flood sets northwestward and the ebb southeastward.

In Boston Main Channel from Spectacle Island to the Navy Yard the velocity at strength varies between 0.5 and 1 knot.

Weather.—The prevailing winds are southwesterly during the summer and northerly during the winter. At all seasons the heaviest gales are usually from northeastward or eastward.

Fogs are prevalent throughout the year. Winds from the east to southwest bring fog while westerly and northerly winds clear it away.

See Appendix for **storm warning** displays in the Boston Harbor area. The appendix also includes a climatological table for Boston Harbor and a table of fog-signal operation.

Ice.—The channels of Boston Harbor are navigable throughout the year. Ice rarely forms in the main channel. Occasionally during severe winters the greater part of the harbor is frozen, but towboats and steamers keep the main channels open. The Charles, Mystic, and Chelsea Rivers and the minor passages in the harbor sometimes are frozen during severe winters. They are almost invariably kept open, however, by tugboat traffic. When ice is prevalent, the buoys may be displaced or even carried away. Local towboats can be employed for the purpose of breaking ice.

Routes.—Boston Harbor and approaches have very broken, rocky bottom, and caution is required.

Approaching Boston from Cape Ann.—The soundings in the vicinity of Cape Ann are very irregular and cannot be depended on to locate even approximately the vessel's position. A **229°** course from 0.2 mile off the lighted whistle buoy 2.5 miles eastward of Cape Ann Light clears the offshore dangers between Cape Ann and Nahant, and leads close to the lighted gong buoy marking the entrance to Boston North Channel.

At night the lighted aids are sufficiently numerous to locate the position by cross bearings. In clear weather the course should be shaped to pass well northward of The Graves Light and enter through the Boston North Channel.

Approaching Boston from Cape Cod.—Approaching the easterly side of the cape, soundings of 20 fathoms indicate a distance of 2 to 3.5 miles from shore, but off the north side of the cape the 20-fathom curve draws closer inshore and the soundings are not so regular. Vessels standing to clear Boston Lightship on a course of **295°** from the locality of Peaked Hill Bar Lighted Whistle Buoy 2PH will cross the southwesterly end of Stellwagen Bank in depths of 12 to 15 fathoms. Soundings on Stellwagen Bank cannot be depended on to locate a position, except near the extreme southwest end of the bank where the shoalest depth of 9.5 fathoms is found.

As the entrance to Boston Harbor is approached, after crossing Stellwagen Bank, soundings of 20 fathoms or more insure a distance of at least 5 miles from the shore and well outside of outlying rocks. Inside the depths of 20 fathoms the soundings are very irregular and cannot be depended upon as a rule to keep a vessel out of danger. Northeast of Nahant the 20-fathom curve runs closer inshore and some of the dangers extend offshore nearly to the curve.

In approaching Boston Lightship from the southward, the coast from Scituate to Minots Ledge Light should be given a berth of 4 miles to avoid the broken ground of Stellwagen Ledges.

Entering Boston Harbor in fog.—In thick weather a course should be laid to clear Boston Lightship by a safe distance when approaching from either Cape Ann or

Cape Cod, and the water should not be shoaled to less than 20 fathoms unless the fog signal of the lightship is heard and the vessel located by radar or other means. From the lightship, steer a course to pass northward of The Graves Lighted Whistle Buoy 5, and enter the harbor via Boston North Channel. Unless the lightship is located, no attempt should be made to enter the harbor.

If a vessel in the vicinity of Cape Cod is overtaken by fog or thick weather, she may find it convenient to anchor in Provincetown Harbor or on the west side of the cape south of Provincetown, where there is a good lee and the holding ground is in 7 to 12 fathoms.

Pilotage is compulsory into Boston Harbor for vessels engaged in foreign trade, with a few exceptions. It is not compulsory for vessels engaged in the coasting trade. A pilot boat will be found within sight of the Boston Lightship. During the winter months, with a northwesterly wind, the Pilot Boat may be found to the northwest of The Graves Lighted Whistle Buoy 5, seeking a lee from Nahant Head. Pilot boats have numbers painted on their sails or stacks in black figures 4 feet high.

A Boston-bound vessel liable to pilotage, arriving within a line drawn from Harding Ledge to The Graves and thence to Nahant Head without being offered the services of a pilot, is exempt from the payment of pilotage fees unless such services are requested. A pilot boat being on its station and displaying the signals required by law constitutes an offer of pilotage service. Such compliance will entitle the pilot to the regular fee for pilotage from vessels otherwise liable therefor. A vessel under 350 tons register bound into the port of Boston declining the services of a pilot is liable to one-half the pilotage fees. A vessel under 350 tons register bound out of the port of Boston is not liable for pilotage unless such services are requested. Vessels in the coastwise trade are exempt from the compulsory payment of pilotage. The office of the Boston Pilots is at No. 69 Long Wharf.

Towage.—Towboats are available at Boston. Lighters and fireboats are also available.

Quarantine.—Vessels are generally boarded dockside; however, a quarantine anchorage is provided on the north side of President Roads. Quarantine is enforced in accordance with the rules of the Public Health Service. The Quarantine Inspector is requested through the Quarantine Station.

A Public Health Service hospital is at Boston.

Customs.—Boston is a port of entry and marine documents are issued.

Immigration.—All passengers and crews of vessels arriving at Boston as first port of call from a foreign port must be examined by the Immigration and Naturalization Service before they are allowed ashore. Vessels are usually boarded at dockside.

Harbor regulations.—There are many rules and regulations of the Commonwealth of Massachusetts and the City of Boston affecting the handling of petroleum products, rafting of lumber, speed of vessels, control of motorboats, pollution and disposal of refuse, handling of lines, movement of vessels as directed, anchorage areas, etc. It is recommended that the navigator obtain from the harbormaster copies of the rules affecting his particular interests. His office is at 521 Commercial Street.

The call for the harbormaster or police steamer is three short and one long blast of the whistle.

Control over movement of vessels.—See **§ 124.10,** Chapter 2, for regulations requiring advance notice of vessel's time of arrival to Captain of the Port.

Wharves.—The port of Boston has more than two hundred piers, wharves, and docks, most of which are located on the main channel at East Boston, Boston proper, Charlestown, and South Boston, and on the Chelsea River and Chelsea waterfront.

The piers and wharves are generally of open pile, timber deck construction, extending from stone or timber bulkheads with solid fill. Many of the piers have direct connections with one or more of the rail lines serving the port and nearly all of them are accessible by wide paved streets. A number of dry and/or cold storage warehouses are located in close proximity to the waterfront and the general cargo terminals are provided with transit sheds and cargo-handling facilities so that freight can be handled efficiently and expeditiously.

Depths of water in the berthing areas at the cargo-handling facilities generally do not exceed 35 feet although a depth of 40 feet is available at Commonwealth Pier No. 5 on the South Boston waterfront.

Public float landings for small craft are at Summer Street and Northern Avenue.

Hoisting facilities on the various piers have capacities up to 50 tons. Arrangements can be made for equipment with capacities up to about 250 tons. The three grain elevators at the port have a total storage capacity of over 2 million bushels.

Supplies.—Fuel oil can be obtained from the wharves or from barges. There are good facilities for bunkering coal-burning vessels. The city water is of good quality and suitable for either drinking or boiler purposse. Gasoline can be procured from floats anchored off Governors Island.

Repairs.—Several drydocks and marine railways are available for vessels of all sizes. Repairs of all kinds can be made. The largest non-government repair facilities are located in East Boston. The largest of several drydocks can handle vessels up to 18,000 tons.

Facilities for handling larger ships are available by special arrangement with the Navy Department; however, the availability of these facilities is governed by Naval needs. The Navy does not enter into competition with non-government facilities. Large vessels are built at Quincy on Weymouth Fore River.

Communications.—Boston is the terminus of several transatlantic steamship lines and is the port of call for numerous lines of coastal vessels. It has through air, rail, and bus connections with all points. There are many trucking firms engaged in short and long freight service from the port.

Chart 248.—East Boston, on the northeastern side of Boston Harbor, is separated from the city of Chelsea by

Chelsea River. The waterfront has modern piers where trans-atlantic passenger steamers berth regularly.

Chelsea is separated from Charlestown, on the western side of the harbor, by the Mystic River. **Charlestown** is separated from Boston proper by the Charles River. The U.S. Navy Yard occupies a large part of the deepwater front of Charlestown. **South Boston** is on the peninsula southeast of the city proper, from which it is separated by Fort Point Channel.

Logan International Airport is between Governors Island Flats and East Boston. The airport area, almost entirely filled land, is low, flat, and quite extensive. **Governors Island,** on the northeast side of Boston Main Channel and at the southerly end of the airport, is a low, grass-covered peninsula.

Castle Island, on the southwest side of Boston Main Channel, 1 mile northwestward of Spectacle Island, is marked by **Fort Independence.** It is connected to the shore westward by filled land. Several boulders bare at low water are a short distance southeastward of Castle Island. Four radio towers are on the island. On the northeast corner of the island is the 52-foot granite **Donald McKay Monument.** It was erected in 1933 to commemorate the famous East Boston clipper ship builder.

Pleasure Bay, just westward of Castle Island, is closed by an earth filled dam extending from the southern end of the island to the jetty light southeastward of **City Point.**

Reserved Channel, 0.5 mile northwestward of Castle Island, has been dredged to a depth of 30 feet up to the drawbridge. The bridge has a retractile span with a clearance of 6½ feet; see § **203.75,** Chapter 2, for operating regulations of the drawspan. Above the bridge the channel has been dredged to 12 feet to its head, but in 1959 the controlling depth was 10 feet.

A modern and extensive freight terminal on the north side of Reserved Channel has berthing space of more than 4,500 feet, with depths of 30 feet or more alongside. On the south side of the channel, a wharf projects east and southward to Castle Island. The berths alongside this wharf have been dredged to a depth of 29 feet.

Fort Point Channel separates Boston proper from South Boston. A dredged channel with a controlling depth of 21 feet in April 1959 leads from the entrance to Dorchester Avenue Bridge, a distance of 0.7 mile. The head of navigation is the cross channel highway fill at Dover Street, about 1 mile above the entrance. The controlling depth in April 1959 was 3 feet from Dorchester Avenue Bridge to the highway fill. Steamers bound into Fort Point Channel require the assistance of towboats.

The deeper portion of the channel is crossed by three bridges. Northern Avenue Bridge has a swing span with a clearance of 7½ feet. Deeper water is found in the east draw. The Congress Street Bridge has a bascule span with a clearance of 6½ feet. The Summer Street Bridge has a retractile span with a clearance of 4½ feet. Three bridges cross the shoaler portion of the channel. The minimum clearance is 4½ feet. See § **203.75,** Chapter 2, for operating regulations of the drawspans.

Charles River, on the western side of the harbor between Boston proper and Charlestown, is the approach by water to **Cambridge** and Watertown. The entrance of the river to the first bridge has been dredged for its full width to a depth of 35 feet. The controlling depth is about 15 feet from this bridge to Charles River Dam, about 1 mile above the entrance.

The lock in the **Charles River Dam** is 350 feet long between gates, with a clear width of 45 feet, and has a depth of 17 feet at low water on the lower sill. The upper sill has 21 feet over it at the level of the river above the dam. See § **207.10,** Chapter 2, for navigation regulations of the lock.

Charles River above the dam is maintained at a height of 7.4 feet above mean low water; a depth of 14 feet can be taken 3 miles above the dam to Western Avenue Bridge, thence 13 feet for 2.2 miles to Arsenal Street Bridge, thence 9 feet for 2 miles to the head of navigation at **Watertown.** The river above the dam is used by many yachts and small craft. No toll is charged for passage through the lock.

Below the dam Charles River is crossed by four drawbridges, and a fixed highway span. The Charleston Bridge has a swing span with a clearance of 23 feet. Use the south span. The center pier is connected with the north side of the next bridge opening. The fixed bridge just upstream from the remains of the Warren Bridge has a clearance of 50 feet. The fender piers of the Warren Bridge, from which the retractile span has been removed, limit the horizontal clearance to 36 feet. The four Boston and Maine Railroad Bridges have bascule spans raised as a unit with a clearance of 3 feet. The Massachusetts Transit Authority Bridge at the dam has a bascule span with a clearance of 33 feet. The highway bridge at the dam has a clearance of 5½ feet. See § **203.75,** Chapter 2, for operating regulations of the drawspans.

Above the dam, Charles River is crossed by eleven fixed bridges. The Longfellow Bridge just above Broad Canal has a clearance of 30 feet above permanent water level. Above this bridge the clearance is 12 feet above permanent water level except at the Galen Street Bridge in Watertown-Newton where the clearance is 11 feet.

Lechmere Canal, adjacent and northwestward of the dam, is crossed near the mouth by a highway bridge with a bascule span having a clearance of 7 feet above permanent water level.

Broad Canal, extending westward from just downstream of the Cambridge end of the Longfellow Bridge, is crossed by four bridges. The first three are highway bridges with bascule spans having a least clearance of 6½ feet. The fourth is a railroad bridge, 0.5 mile above the mouth, with a swing span having a clearance of 2½ feet.

Little Mystic Channel is a slip about 0.6 mile long just northward of the Navy Yard at Charlestown. Midchannel depths range from 31 feet at the entrance to 17 feet 600 yards westward of the bridge. The fixed highway bridge over the channel has a clearance of 100 feet. The horizontal clearance in the channel is limited to 75 feet due to the remains of the approaches of the former Chelsea Street Bridge immediately downstream.

Chelsea River, emptying into Boston Harbor from east-

ward between East Boston and Chelsea, is the approach to important wharves and facilities, and to the city of **Revere** at the head, 2.6 miles above the entrance.

A Federal project provides for a channel 30 feet deep from the mouth of the river to a point about 1 mile upstream from the Chelsea Street Bridge.

Two drawbridges cross the river. The Meridian Street Bridge, just above the mouth, has a bascule span with a clearance of 20 feet. The Chelsea Street Bridge, 0.8 mile upstream, has a bascule span with a clearance of 9 feet. See **§ 203.75,** Chapter 2, for operating regulations of the drawspans.

Chelsea River has a heavy traffic of deep-draft oil tankers. The tankers berth at the oil company terminals and storage areas on both banks of the river.

Mystic River, which empties into Boston Harbor opposite Chelsea River, is the approach by water to the towns of **Medford** and **Malden.**

A Federal project provides for a channel 35 feet deep from the Mystic River Bridge to about 300 feet below the Malden Bridge, thence 20 feet deep to about 800 feet above the Malden Bridge, thence 6 feet deep to the first turn above Dennings Wharf, 2.6 miles above the mouth, and thence 4 feet deep to Craddock Bridge, 4.4 miles above the mouth. In 1959 the controlling depth from just above Malden Bridge to Craddock Bridge was 3 feet.

At the mouth of the Mystic River is a high-level fixed highway bridge with a clearance of 135 feet. The Malden Bridges, 1.2 miles above the mouth have bascule spans with a least clearance of 6½ feet. Two railroad bridges, 1.5 miles above the mouth, have swing spans with a clearance of minus 3½ feet; these bridges operate as a unit. The railroad bridge, just upstream from the Malden River entrance, has a swing span with a clearance of minus 3½ feet. The Wellington Bridge, 2.2 miles above the mouth, has a bascule span with a clearance of 10 feet. The Harvard Street Bridge, 3.3 miles above the mouth, has a bascule span with a clearance of 5 feet. See **§ 203.75,** Chapter 2, for operating regulations of the drawspans.

Island End River is a tributary of the Mystic River from northward, 0.5 mile above the entrance. A large wharf is at the western side of the entrance with a channel privately dredged to 30 feet leading to it. The wharf, which is about 350 yards long, had a least depth alongside of 26 feet in April 1959 to within 100 yards of its northerly end. A smaller wharf about 150 yards above the large wharf had a least depth of 2 feet in April 1959. Above the large wharf, the river gradually shoals from 4 to less than 2 feet at its head. There is considerable business at the wharves near the entrance, principally vessels carrying coal and oil. A rocky shoal on the east side of the entrance, and the current of Mystic River running across the entrance, make navigation difficult for large vessels. A towboat usually is employed to assist such vessels.

Malden River, a tributary of the Mystic River from northward, has a dredged channel 6 feet deep for a distance of 1.6 miles upstream. In April 1959 the controlling depth to the first highway bridge was about 2 feet. Two highway bridges with bascule spans cross the river. The first, 0.2 mile above the mouth, has a clearance of 7 feet; see **§ 203.75,** Chapter 2, for drawspan regulations. The second, 1.1 miles above the mouth, has a clearance of 3 feet.

Chart 246.—North and west of President Roads is an area of flats, much of which bares at low water. Between **Deer Island Flats** and **Governors Island Flats** a buoyed channel with a least deph of 9 feet leads to **Winthrop.** Branch channels lead to several yacht clubs.

The easterly channel leading to Winthrop Head had a depth of 6 feet in 1958. A light marks the west side of the entrance and buoys mark the channel. **Snake Island,** on the westerly side of the channel, is 10 feet high and barren.

The westerly channel leading to **Belle Isle Inlet** has been dredged to provide fill for the airport. In 1959 the channel had a least depth of 16 feet. A special anchorage area has been designated just south of the inlet; see **§ 202.1** and **§ 202.30,** Chapter 2, for limits and regulations. The fixed highway bridge over the mouth of the inlet has a clearance of 4 feet.

Dorchester Bay extends southwestward from President Roads between Spectacle Island and Thompson Island on the east, and South Boston on the west. The bay is filled with extensive flats, large areas of which are nearly bare at low water and rise abruptly from the edge of the channel.

The principal traffic through the bay is in oil and building materials. Tankers berth at Commercial Point. Barges and schooners are towed to Neponset and North Quincy.

A Federal project provides for a channel 25 feet deep from President Roads to Commercial Point, thence 15 feet deep to the Neponset Highway Bridge, 1.3 miles above the mouth of the Neponset River. In 1959 the controlling depth was 17 feet to the junction with Squantum Channel, thence 13 feet to the highway bridge. The channel is buoyed.

Special and general anchorage areas have been designated for Dorchester Bay; see **§ 202.1, § 202.30,** and **§ 202.134,** Chapter 2, for limits and regulations. The yacht anchorage most commonly used is south and east of City Point, clear of the cable area.

A **measured nautical mile** on bearing **242°30′** is at the entrance to Dorchester Bay. The range markers are on Spectacle Island and Thompson Island.

Old Harbor, on the west side of Dorchester Bay just south of South Boston, is filled with flats having little water over them. A channel with a least depth of 5 feet leads to the yacht clubs and the public float in the northeastern part of the harbor.

Squantum Channel leads from the main channel in Dorchester Bay to a marina east of **Squantum Point.** In 1959 the controlling depth was 16 feet in the channel and 15 feet in the basin at the shore end. Complete service facilities and supplies are available.

Commercial Point, on the west side of the entrance to Neponset River, can be identified by a large gas tank

and tall stack. A dredged channel north of the point leads to **Dorchester Bay Basin.** In 1959 the controlling depth to the yacht club on the northwest side of the basin was about 8 feet. The entrance to the basin is crossed by a highway bridge with a bascule span having a clearance of 13 feet; see **§ 203.75,** Chapter 2, for operating regulations.

Neponset River enters Dorchester Bay from the south between Commercial Point and Squantum Point. A dam is at **Milton,** 3 miles above the mouth. Power barges are taken as far as the Granite Avenue Bridge, 2.3 miles above the mouth. Small craft with local knowledge navigate to Milton during times of high water. Several yacht clubs are on the river.

Three drawbridges with bascule spans and one fixed bridge cross Neponset River below the dam at Milton. The least clearance for the drawspans is 6 feet and for the fixed span is 30 feet; see **§ 203.75,** Chapter 2, for operating regulations of the drawspans.

Pilotage is not compulsory for Neponset River, but pilots are generally taken by strangers.

The largest of the several marine railways at the repair yards on the river, where yachts are constructed or repaired, can handle vessels up to 200 tons in weight, 125 feet in length, and 12 feet in draft.

Quincy Bay indents the southerly shore of Boston Harbor between the peninsulas of Squantum and Houghs Neck. Depths in the bay are in general 8 to 10 feet, but shoals partly bare at low water extend 0.5 to 0.7 mile from its southerly side.

Special, general, and explosive anchorages have been designated for Quincy Bay; see **§ 202.1, § 202.30,** and **§ 202.134,** Chapter 2, for limits and regulations.

The wharf extending from the south side of **Rainsford Island,** at the northeastern entrance to Quincy Bay, is in ruins. **Quarantine Rocks** extend 0.5 mile southward of the island.

A **measured nautical mile** on bearing **225°** is in the western portion of Nantasket Roads. The range markers are on the northwest side of Peddocks Island.

Sunken Ledge, dry at low water, is about 1 mile southward of Rainsford Island. A daybeacon is on the ledge and a light is 0.2 mile southeast of it. A buoy marks a channel west of the ledge.

Hangman Islet, small and rocky, is near the middle of the entrance to Quincy Bay, 0.6 mile southwestward of Sunken Ledge. The end of a reef extending 0.2 mile southwestward from the islet is marked by a daybeacon. A ledge with a depth of 2 feet over it is 0.4 mile northward of the daybeacon.

Squantum, on the west side of Quincy Bay, is marked by an elevated tank. Two lighted radio towers in **North Quincy,** southwestward of Squantum, are visible from the bay. **Moon Head,** which can be recognized by the grassy hill and bluff on its easterly end, is connected to Squantum by a causeway.

A channel with depths of 7 to 12 feet leads northward from Quincy Bay between Moon Head and Long Island to President Roads. A fixed bridge across the channel has a clearance of 48 feet. The route is either by **Western Way,** between Thompson Island and Spectacle Island, or by Sculpin Ledge Channel, westward of Long Island.

Wollaston Channel, near the westerly end of Quincy Bay, has depths of about 8 feet at the outer end and depths of about 4 feet near the inner end. In 1959 the portion near the inner end had a reported depth of 1 foot. The channel is marked by buoys. The yacht clubs are at the head of the channel.

Houghs Neck, on the southeast side of Quincy Bay, is marked at its northeasterly end by **Quincy Great Hills,** 100 feet high and mostly settled. An elevated tank on the hill is very conspicuous. **Nut Islet,** marked by a power station and stack, is connected by a causeway 300 yards northward of Quincy Great Hill. **West Gut** is a buoyed channel leading into Hingham Bay between Nut Islet and Peddocks Island.

Hingham Bay is that part of Boston Harbor southeastward of Peddocks Island. It is the approach to Weymouth Fore River, Weymouth Back River, Hingham Harbor, and Weir River. Extensive shoals make out from the southerly shore and surround the islands in the bay. **Hull Bay,** the eastern part of the bay, also has many shoal areas.

The easterly entrance to Hingham Bay is through Nantasket Gut, but the entrance through West Gut, southward of Peddocks Island, is frequently used by vessels bound into Weymouth Fore or Back Rivers.

Nantasket Gut, a narrow channel between Peddocks Island and Windmill Point, leads into Hingham Bay from Nantasket Roads. The tidal currents have an average velocity of about 2.2 knots at strength and generally follow the direction of the channel; the flood sets southward and the ebb northward. An unmarked 14-foot spot is near midchannel and a 15-foot spot is about 500 yards southward of Windmill Point Light.

A dredged channel about 13 feet deep, commencing just southward of the buoy marking **Inner Seal Rock,** leads to a wharf on the northwest side of **Hog Island.** The island is connected to the mainland by a fixed bridge.

A daybeacon marks the outer end of an overflow pipeline extension with riprap cover off the northeast end of Nut Islet. The pipeline extends 150 yards into the bay and is submerged at high water. **Pig Rock,** about 0.6 mile eastward of Nut Islet, is visible at all stages of the tide. It consists of a pile of rocks on the shoal area formerly used as a foundation for a light.

The Quincy Yacht Club is on the eastern side of Houghs Neck. A channel marked by buoys and private range lights leads to the club wharf.

Weymouth Fore River has its entrance on the southwest side of Hingham Bay between Houghs Neck and **Grape Island,** and is the approach by water to **Quincy Point, Weymouth, East Braintree,** and several landings. A large shipyard, an electric power plant, and several other industries are on the river. Oil is the major cargo.

The following are prominent upon entering the river: the large stacks of the Boston Edison Power Plant on the east side of the river just above the bridge; the two

tall radio towers near **Quincy Center**; and a red neon sign lighted at night on the Cities Service Company stack, and a pole-type mast above **Germantown** on the west side of the river.

A Federal project provides for a channel 30 feet deep from Nantasket Roads through Nantasket Gut and Hingham Bay to and including a maneuvering basin 0.5 mile above the Weymouth Fore River Bridge, and a channel 27 feet deep through West Gut into Hingham Bay. In 1959 the controlling depths were: 17 feet from Nantasket Gut through Hingham Bay to abreast **Sheep Island**; thence 26 feet to Weymouth Fore River Bridge; and thence 21 feet above the bridge to the limit of the project. A channel with a controlling depth of about 5 feet continues up the river to Weymouth, which is the head of navigation. The channel through West Gut has a controlling depth of about 23 feet.

A special anchorage area has been designated in Weymouth Fore River; see **§ 202.1** and **§ 202.30,** Chapter 2, for limits and regulations.

Two highway bridges with bascule spans cross the Weymouth Fore River. The one at Quincy Point has a clearance of 33 feet and the other at Weymouth has a clearance of 12 feet; see **§ 203.75,** Chapter 2, for operating regulations of the drawspans. The overhead power cables across the 5-foot channel between the two bridges have a least permit clearance of 100 feet.

Town River Bay is a branch of Weymouth Fore River north of Quincy Point. A Federal project provides for a channel 27 feet deep from the junction with Weymouth Fore River to a point 1 mile upstream, with a turning basin 24 feet deep at the inner end; thence 15 feet deep to a point just below the Quincy Electric Light & Power Company plant, 1.2 miles above the mouth.

Three oil terminals, a lumber wharf, a yacht club, and several yards for the repair and storage of yachts are on the Town River Bay. A shipyard has a marine railway capable of hauling out vessels up to 800 tons in weight, 175 feet in length, and 14 feet in draft.

Weymouth Back River, is just eastward of Weymouth Fore River and southward of **Grape Island.** A wharf of a fertilizer works is on the north side of the river on **Eastern Neck.** A dredged channel with a controlling depth of about 15 feet extends from the junction with the channel at the entrance to Weymouth Fore River to Lincoln Street Bridge; thence about 11 feet for 0.5 mile above the bridge. The channel is buoyed, but strangers desiring to enter the river in large vessels should take a pilot or towboat.

A good anchorage is at the entrance to Weymouth Back River, 0.2 to 0.3 mile westward of Grape Island. A special anchorage area has been designated in Weymouth Back River; see **§ 202.1** and **§ 202.30,** Chapter 2, for limits and regulations.

The Weymouth Back River is crossed by the fixed Lincoln Street Highway Bridge with a clearance of 36 feet, 1.8 miles above the entrance. The river above this bridge is closed to navigation except on permit.

Hingham Harbor and Weir River in the southeasterly end of Hingham Bay are shallow. Their common entrance is close westward of **Bumkin Island.** The channel leads in a southeasterly direction for about 0.5 mile from the westerly end of Bumkin Island and then divides. The branch leading eastward is Weir River.

The channel leading to Hingham Harbor trends southward, is narrow, and has a depth of 14 feet up to the harbor entrance off Crow Point. The channel is buoyed. The Hingham Yacht Club has a clubhouse, dock, and floats at Crow Point. The yacht club maintains the range lights on Crow Point during the summer. It is reported that considerable shoaling has occurred along the face of the pier and the northern half cannot be approached by large vessels, except at half tide or higher. Fresh water is available at the yacht club pier.

Hingham Harbor is a cove 1 mile in length, with an average width of about 0.6 mile. At low water it is a dry flat through which a narrow and tortuous channel winds to the town of **Hingham.** The channel has a controlling depth of about 5 feet to the old steamboat wharf. The small-boat basin at the south end of the harbor has been dredged to depths of 4 to 6 feet. Sometimes the channel is marked by bush stakes in the summer. Unless the channel is marked, it is difficult to follow.

Weir River leads to the wharf at **Nantasket Beach.** The channel has a controlling depth of about 14 feet, but extensive flats, mostly bare at low water, are on both sides of it. Privately maintained buoys and daybeacons mark the channel during the summer. The channel is used by passenger steamers running from Boston to Nantasket Beach during the summer. Nantasket Beach has a large steamer wharf with 16 to 18 feet alongside, and a public float landing for small craft north of it which is in place during the summer. There is an amusement park with a roller coaster at Nantasket Beach.

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12. MINOTS LEDGE TO PROVINCETOWN, MASSACHUSETTS

Chart 244.—Minots Ledge Light (42°16.2′ N., 70°45.6′ W.), 85 feet above the water and visible 15 miles, is shown from a dark gray conical tower, 97 feet high, on **Outer Minot.** This drying ledge is about 6 miles southeastward of Point Allerton and 1 mile north-northeastward of **Strawberry Point,** the northeastern extremity of **Scituate Neck.** Outer Minot is the outermost of the visible dangers off the entrance to Cohasset Harbor.

Submerged rocks and very broken ground, on which the sea breaks in heavy weather, extend more than 1 mile northeastward and 2.5 miles eastward of the light. The outer limit of the broken ground is marked by a lighted whistle buoy, 2.4 miles eastward of Minots Ledge Light. This area should be avoided.

Numerous rocks and ledges extend westward and southward from the light across the entrances to Cohasset Harbor. **East Shag Rock** and **West Shag Rock,** which show at high water, are the most prominent southwestward of the light. Shifting boulders are reported on the shoal just eastward of **Barrel Rock** which is marked by a daybeacon.

Three natural channels lead into Cohasset Harbor through the area of rocks and ledges: **Western (Brush Island) Channel,** which enters between **Brush Ledge** and **Chittenden Rock**; **The Gangway,** a passage which leads between **West Hogshead Rock** and **The Grampuses**; and **Eastern Channel,** which leads between **Enos Ledge** and **West Willies.** Although all three channels are marked by buoys, there are numerous unmarked dangers.

The Gangway passage is the widest but there are unmarked 9- and 10-foot rocky shoals in the middle of it, and it should be used only in clear weather, and with a smooth sea, even in small craft. Eastern Channel is the clearest and deepest of the three. The best time to enter is on a rising tide.

Boundary lines of inland waters.—The lines established for the waters described in this chapter are given in **§ 82.10,** Chapter 2.

Cohasset Harbor is a large shallow cove southwestward of Minots Ledge Light and about 6 miles southeastward of Point Allerton. The harbor is frequented by numerous yachts and fishing craft. A prominent lookout tower is on **The Glades** on the east side of the harbor. Anchorage is available in depths of 6 to 10 feet in the so-called outer harbor. A channel 6 feet deep was dredged to the inner harbor but in 1959 it was reported to have shoaled to a controlling depth of about 2 feet. The channel is marked by lights and buoys.

Cohasset Cove, the inner harbor, is protected by a breakwater which extends about 0.1 mile northward from near the westerly end of **Bassing Beach.** The breakwater is partially covered at high water. Anchorage in 5 to 10 feet is available in the inner harbor southward and southwestward of **Bryant Point,** which is marked by a light. In 1959 a channel 6 feet deep was dredged through the entrance of **Bailey Creek** to an anchorage basin of the same depth in the creek, which is on the southeastern side of the inner harbor.

The fish wharves at the extreme head of the harbor are bare at low water. Gasoline, fresh water, and provisions are obtainable. There is a boatyard with a marine railway capable of hauling out craft up to 60 feet in length and 6 feet in draft. The yacht club, close westward of Bryant Point, has a pier and float with 8 feet alongside. Fresh water and power are available at the float. The town float landing in the westerly arm of the cove has about 3 feet alongside. An oil wharf where gasoline and water are available is close eastward of the landing.

In normal winters the inner harbor is usually closed by ice for about two months.

Stellwagen Ledges, consisting of rocks awash and sunken, extend 3.8 miles south-southeastward from Davis Ledge to Tar Pouch. Some of these covered ledges lie over 1 mile from shore and have from 5 to 16 feet over them in surrounding depths of 4 to 9 fathoms. Most of them are unmarked. When in the vicinity strangers should keep over 3 miles from shore.

Davis Ledge with 13 feet over it, about 0.4 mile eastward of Minots Ledge Light, is marked by a bell buoy. **Tobias Ledge,** about 0.25 mile eastward of Strawberry Point, is marked by a daybeacon. **Tar Pouch** with 14 feet over it, about 0.9 mile northeastward of Cedar Point, is marked by a buoy.

Scituate Harbor, about 4 miles southeastward of Cohasset Harbor, is used mostly by yachts and fishermen, and occasionally as a harbor of refuge by draggers. The harbor is mostly bare at low water, except through the center part where it has been dredged to form a channel and anchorage basin. It is partially protected by breakwaters at the entrance. A light marks the seaward end of the north breakwater, and buoys mark the channel. In 1959 the controlling depth was 10 feet in the channel to the anchorage basin beyond Town Pier. The anchorage basin at the head of the harbor has depths of 6 to 10 feet.

Cedar Point, on the north side of the harbor, is marked by a white unused lighthouse tower which is maintained by the town of **Scituate (P.O.),** which is on the west side of the harbor.

On the high land about 2 miles westward of the entrance to Scituate Harbor there is a conspicuous high tower with pointed top which is visible many miles from seaward.

About 1 mile northwestward of the entrance is a group of tall radio towers which are very conspicuous when approaching the harbor.

The north breakwater extends about 300 yards southeastward from the southeast extremity of Cedar Point. **Scituate North Jetty Light (42°12.2′ N., 70°42.8′ W.)**, 39 feet above the water and visible 7 miles, is shown from a red skeleton tower with small white house on the seaward end of the breakwater. The south jetty extends about 100 yards northward from the southern point of the entrance.

It is reported that the bar at the entrance breaks entirely across the channel at low tide and in heavy weather. The most unfavorable weather is from the northeast. The harbor is free of ice most of the winters.

At the Town Pier and at the adjoining wharf are floats with 5 feet alongside where gasoline, water, and supplies are obtainable. A yacht club maintains a pier and float with 6 feet alongside. Gasoline and water are available on the float. A boatyard has a marine railway capable of hauling out craft up to 45 feet in length and 6 feet in draft. The Scituate Coast Guard station is on the point at the southern side of the harbor entrance. See Appendix for **storm warning** display.

Just southward of the entrance to Scituate Harbor is a bluff known as **First Cliff**. A similar formation, known as **Second Cliff**, is about 0.6 mile south of the entrance.

Chart 1207.—New Inlet, on the north side of Fourth Cliff and 2 miles southward of Scituate Harbor, is the approach to North River and South River. **Fourth Cliff** is marked by two rectangular, slightly elevated structures. See Appendix for **storm warning** display.

The inlet had a reported depth of 5 to 6 feet on the bar in May 1959. Tugs towing barges drawing up to 10 feet cross the bar at high water. It is marked by a bell buoy off the entrance and by several channel buoys, but the channel is subject to change and is never entered except by small craft with local knowledge. The bar consists of boulders, some of which are very large. A strong current flows out of the inlet during the falling tide.

Sand and gravel are shipped from a plant located on **Herring River**, a tributary of North River from the north. A channel 5 to 6 feet deep has been dredged to the wharf at the plant.

North River formerly emptied into the sea near **Rexhame**, but its present outlet dates from the great storm of 1898. The river has been partly cleared of boulders to **Hanover** about 10 miles above the entrance. The depth to this point is about 3 feet. Local knowledge is required to navigate the river. Two bascule highway bridges over it are rarely opened. The first bridge, 1.6 miles above the mouth, has a clearance of 12 feet; see **§ 203.77**, Chapter 2, for drawspan regulations. The second bridge, 4 miles above the mouth has a clearance of 7 feet.

South River, emptying through New Inlet from southward, is used by fishermen and yachtsmen. **Humarock** (P.O.) is a small village on the beach between South River and the ocean, and about 1.5 miles southward of New Inlet. Local knowledge of the river channel is required to navigate to the town. Privately maintained buoys mark the channel during the summer months. A reported depth of 1½ feet exists opposite Humarock. At a float landing gasoline and some supplies are available. Two boatyards build and repair small craft up to 40 feet in length and 6 feet in draft. Two small fixed highway bridges span South River at Humarock; the first has a clearance of 7 feet.

Chart 245.—Brant Rock (P.O.) is a village about 5 miles southward of Fourth Cliff. A square concrete tower near the village is very prominent. For about 1 mile south of Brant Rock to the entrance of Green Harbor River, foul ground extends offshore for nearly 1.5 miles to **Farnham Rock**. A lighted bell buoy is just eastward of the rock.

Green Harbor River has its entrance on the south side of **Green Harbor Point**. **Bartlett Rock**, which uncovers 2 feet, and **Howland Ledge** with 7 feet over it, are 0.6 and 1.2 miles, respectively, eastward of the entrance. Both are marked by buoys. A small jetty, covered at high water, is on each side of the entrance. The channel was dredged to a depth of 6 feet by the state. The controlling depth between the jetties was 3 feet in May 1959. A depth of 2 feet is about 75 yards off the end of the east jetty.

Green Harbor (P.O.) is a small village on the west side of the river. Three high, steel radio towers, prominent for many miles, are just southwest of the village and 5 miles northward of the entrance to **Plymouth Bay**. A wharf, where gasoline and some supplies are available, and a small boatyard, are opposite the village.

High Pine Ledge, bare at lowest tides, is marked on its easterly side by a buoy about 0.8 mile off **Duxbury Beach**, and 2 miles northward of Plymouth (Gurnet) Light. The ledge extends from the buoy nearly to the shore; vessels should not attempt to pass westward of the buoy.

Chart 1208.—Cape Cod Bay is contained between the peninsula of Cape Cod on the east and south, and the mainland of Massachusetts on the west. Between these limits it is about 20 miles in diameter, with deep water, the soundings varying from 10 to 27 fathoms, except close to the shore and in its southeasterly part. **Race Point**, the northwesterly extremity of **Cape Cod**, is the eastern point, and **Gurnet Point**, north of the entrance to **Plymouth Bay**, is the western point of the entrance to **Cape Cod Bay**.

Within the limits of Cape Cod Bay are several harbors—those of Plymouth on the western shore, Sandwich and Barnstable on the southern shore, and Wellfleet and Provincetown on the eastern shore. It is also the approach to Cape Cod Canal, connecting Cape Cod Bay with **Buzzards Bay**. The western side of Cape Cod Bay, out to a distance of 4.5 to 7 miles from the shore, from Boston Harbor to the entrance of Cape Cod Canal, has been examined by means of a wire drag, and the dangers are shown on the charts. The dangers within a distance of 0.5 to 1 mile of shore were not in general covered with the drag.

The shallow harbors of Cape Cod Bay, such as Plymouth, Barnstable, and Wellfleet, usually are closed to

navigation by ice a part of each winter. This ice, together with the ice that forms in the shallower parts of Cape Cod Bay in severe winters, is driven by the winds out into the bay. There it masses into heavy fields or windrows, sometimes as much as 10 feet or more thick, making navigation in parts of the bay unsafe or impracticable. The prevailing northerly winds drive it down to the southern end of the bay, but occasionally, at intervals of years, it has been known to obstruct Provincetown Harbor for a few days. The movements of the ice are dependent largely on the winds, the tidal currents apparently having little or no effect.

Deep-draft vessels entering Cape Cod Bay from the northward should pass eastward of the lighted whistle buoy which is about 7 miles northeastward of Brant Rock and well east of the extremity of the broken bottom extending over 4 miles offshore in this direction. Although this broken ground has been examined by means of the wire drag, the depths are such as to require deep-draft vessels to follow that course.

Chart 245.—Plymouth Bay is about 20 miles southeastward of Minots Ledge Light. From its entrance, between Gurnet Point and Rocky Point, it extends about 2.5 miles westward to **Plymouth (Long) Beach. Gurnet Point,** on the north side of the entrance to the bay, is marked by **Plymouth (Gurnet) Light (42°00.2′ N., 70°36.1′ W.)**, 102 feet above the water, visible 16 miles, and shown from a white octagonal tower, 39 feet high, with a white dwelling. The light station has a fog signal. See Appendix for **storm warning** display.

Rocky Point, on the south side of the entrance, is about 3 miles south of Gurnet Point. **Outer Tautog Rock,** with 2 feet over it, is part of an unmarked shoal extending about 0.5 mile northward of the point. **Warren Cove,** the southern part of Plymouth Bay, is sometimes used as a temporary anchorage.

Browns Bank is in the central part of Plymouth Bay. Northward of Browns Bank, and between it and **Saquish Neck** and **Saquish Head,** is the entrance channel to Plymouth Harbor and Duxbury Bay.

Duxbury Pier Light (41°59.2′ N., 70°38.9′ W.), 35 feet above the water and visible 11 miles, is shown from a brown conical tower. The light station has a fog signal. It marks the north side of the channel and the south end of the shoal between the main channel and **Cowyard.**

The controlling depth through the entrance channel, from off Gurnet Point to the intersection of the three channels at the south end of the Cowyard, is about 20 feet. A 16-foot spot north of the channel, 0.85 mile southwestward of Plymouth Light, can be avoided when inbound by steering the range Duxbury Pier Light and North Plymouth tall stack. The channel is well marked and easily navigated in clear weather. The channels into the tributaries are described under their headings.

Vessels waiting for the tide or weather may anchor on the north side of the entrance channel southeast of Saquish Head and eastward of the buoy marking the extremity of the shoal making southward from that head; or they may proceed to the intersection of the bay channels and anchor where the swinging room is greatest, between 500 and 600 yards westward of Duxbury Pier Light.

Captains Hill, on the peninsula between Duxbury and Kingston Bays, is about 200 feet high. On its summit is **Standish Monument** which can be seen from all directions when approaching the harbor. **Manomet Hill,** about 5 miles southward of Gurnet Point, is more than 390 feet high, heavily wooded, and is conspicuous in approaching the entrance. A fire control lookout tower is on the hill. On Manomet Point, a hotel building is prominent. The monument at Plymouth, a standpipe, and several tanks in and about Plymouth, a lookout tower on **Monks Hill,** about 2.5 miles westward of Plymouth, and the buildings and stack of the Plymouth Cordage Company at **North Plymouth** are prominent. From eastward and northeastward the buildings at Plymouth also are conspicuous.

Duxbury Bay is between Duxbury Beach on the east, Saquish Neck on the southeast, and the mainland on the west. It is about 3 miles long, with an average width of 2 miles. The bay is full of flats, mostly bare at low water, through which are several narrow and crooked channels. Shoals covered in spots by little water rise abruptly on both sides of these channels, and at low water the shoal edges are revealed by discolored water.

Where the several bay channels come together in the locality westward of Duxbury Pier Light, a channel extends northward up Duxbury Bay until west of **Clarks Island.** This channel, **Cowyard,** about 200 yards wide and with depths of 20 to 40 feet, offers good anchorage for small craft. The channel splits at a point westward of Clarks Island. The eastern branch continues up to the easterly side of Duxbury Bay, but is difficult to follow and is not used much. A fixed highway bridge at **Powder Point,** which separates **Back River** from Duxbury Bay, has a clearance of 5 feet.

The western branch has a deep natural channel for about 1.5 miles from the locality of Clarks Island northward of the fork in the channel. To this point the channel is buoyed and easily followed. A Federal project provides for a channel 8 feet deep from the western branch to an anchorage basin at the village of **Duxbury** (P.O.). This channel is marked by privately maintained daybeacons. In 1960 the controlling depth was 8 feet in the channel and anchorage basin. A marine railway, capable of hauling out boats up to 15 tons in weight, and 50 feet in length, is just south of Duxbury Town Pier. Gasoline and some supplies are available. The yacht club is close northward of the town pier. There is 8 feet of water alongside the town pier and yacht club float.

Kingston Bay, between the mainland and the western point of Duxbury Bay, is about 1.5 miles wide. However, because of its numerous flats, it is unfit for navigation except at high water and with a pilot. The village of **Kingston** (P.O.) is nearly 1 mile back from its western shore on **Jones River.** This bay is of negligible importance either as a harbor or port.

A channel 18 feet deep has been dredged from the southerly end of the Cowyard westward of Duxbury Pier

Light to the Plymouth Cordage Company wharf, 1.7 miles northwestward of Plymouth. The channel is marked by buoys.

The bar at the entrance shoals rapidly after each dredging. In 1959 the depth over it was 11 feet. That part of the channel between **The Nummet** and the wharf had a reported depth of 14 feet in 1959. The section of the channel approaching the wharf is privately marked. The outer face of the wharf has a depth of 12 feet. A basin 12 feet deep has been dredged on the northwest side of the Cordage Company's dock. There are no berthing facilities on the southeast side of the dock. A boatyard with two marine railways and boatshops is about 400 yards southward.

The unmarked channels in Kingston Bay and Duxbury Bay are narrow and crooked and lead between flats or nearly so at low water, and local knowledge is required to carry the best water. The best time for strangers to navigate these channels inside the harbor is at low water when the flats are visible.

Plymouth Harbor is about 1 mile wide at its northern end, gradually narrowing to its southern end. Most of the harbor is dry at low water. The channels in Plymouth Harbor and tributaries usually have soft bottoms. The channel through the entrance is well marked and easily followed in clear weather.

A dredged channel extends from the northwestern end of Plymouth Bay, from a point about 500 yards southwestward of Duxbury Pier Light, to the Town Wharf, about 500 yards northwestward of the State Pier at Plymouth. In May 1959, the controlling depths were 14 feet to the State Pier, and in March 1958, 12 feet to the Town Wharf. The channel is marked by a light with a white sector marking the entrance, buoys, and privately maintained lighted ranges. The range structures are difficult to identify in the daytime.

The best anchorage is in the Cowyard, but small light-draft vessels often find good anchorage under the lee of Plymouth Beach. Yachts and small craft anchor in the anchorage basins off the wharves at Plymouth. A special small-vessel anchorage is southwestward of the State Pier; limits and regulations are given in **§ 202.1** and **§ 202.35**, Chapter 2.

Plymouth (P.O.) is a town on the southwestern side of Plymouth Harbor. There is some waterborne commerce at Plymouth, most of it being shipments to and from the cordage firm. At the Town Wharf fishing craft unload fish, scallops, and lobsters for shipment to New York markets.

Tides and currents.—The mean range of the tide is about 9.2 feet at the entrance and about 9.5 feet at Plymouth. In the channel between Gurnet Point and Duxbury Pier the tidal current at strength has a velocity of about 1.2 knots. The set is generally in the direction of the channel; but the ebb sets southward and eastward across Browns Bank, while the flood sets northward and westward above Saquish Head, and sweeps strongly around Duxbury Pier Light northward into the Cowyard.

Ice often closes this harbor from about the first of January through February. When there is ice in the harbor, the Cowyard is not a safe anchorage. In winter the safest anchorage from ice is in the channel southward or eastward of Saquish Head, and vessels sometimes go to sea on account of drift ice at this anchorage. Westerly winds have a tendency to carry the ice out in fields. Normally the channel to the Plymouth Cordage Company dock is open to traffic all winter.

Pilotage is compulsory for foreign vessels only.

Customs and quarantine.—Plymouth is a customs port of entry and marine documents are issued. Arrangements for quarantine inspection are made through the collector of customs.

The office of the **harbormaster** is at the Town Wharf.

Wharves.—Duxbury has several wharves and float landings and numerous moorings in the anchorage basin. Gasoline and some supplies are available.

At Plymouth vessels with a maximum draft of 12 feet berth at the State Pier. Craft drawing a maximum of 8 feet berth at the Town Wharf. A yacht club and several wharves and floats are along the waterfront. Gasoline, diesel oil, ice, water, marine supplies, and provisions can be obtained.

Repairs.—Several boatyards at Plymouth have marine railways, the largest of which can haul out vessels of 150 tons, a length of 100 feet, and a draft of 12 feet. All engine and hull repairs can be made and a machine shop is available.

Chart 1208.—Between Rocky Point and Manomet Point, a distance of 2.5 miles, there are several outlying rocks which will be avoided by giving the shore a berth of 1 mile. The shore is backed by high wooded hills, the most conspicuous of which is Manomet Hill, 390 feet high. **Manomet Point** is a bluff marked by a prominent hotel.

White Horse Beach (P.O.) is a summer resort northwest of Manomet Point. **White Horse Rocks**, a group of rocks awash, are part of an unmarked shoal which extends about 0.7 mile northward from White Horse Beach.

Mary Ann Rocks, two rocks that bare at half tide, are 0.7 and 0.9 mile southeastward of the northerly end of Manomet Point, and are marked by a whistle buoy and a lighted gong buoy, 0.8 mile and 1.4 miles eastward, respectively, from the outer rock. **Stone Horse Rocks**, bare at low water, are southwestward of Mary Ann Rocks and form a part of a reef extending 0.7 mile southeastward from Manomet Point.

Stellwagen Rock, with 6 feet over it and unmarked, is 1.7 miles southward of Manomet Point and 0.8 mile from shore.

From Manomet Point to **Peaked Cliff**, a distance of 7 miles, the shore is a line of high bluffs backed by woods. Shoals with little water in places extend 0.6 mile from shore just southward of **Center Hill Point.**

Ellisville Harbor is a small-boat harbor about 0.4 mile northward from **Lookout Point.** The entrance which is almost bare is protected by a small jetty on the northern side. The basin is shoal and available for small craft only at half tide or better.

From Peaked Cliff the shore is low and trends southeastward. At the resort town of **Sagamore Beach** (P.O.),

2 miles northwestward of Cape Cod Canal, a standpipe is prominent.

Chart 251.—Cape Cod Canal is a deep-draft sea-level waterway that extends westward from Cape Cod Bay to the head of Buzzards Bay. The waterway has a project depth of 32 feet and a least overhead clearance of 135 feet. The eastern entrance to the canal is marked by lighted buoys, lights, a fog signal, and a radiobeacon.

A detailed description of the Cape Cod Canal and its facilities are given in **United States Coast Pilot 2, Atlantic Coast, Cape Cod to Sandy Hook.**

Chart 1208.—Cape Cod is a long peninsula forming the easterly extremity of Massachusetts. It makes out from the mainland in an easterly direction for 31 miles, thence extends northward for over 20 miles. The portion of Cape Cod between Cape Cod Canal and Chatham is known as the **Upper Cape.** This region is wooded and is well settled by numerous towns and villages. The northern trend of Cape Cod, forming what is sometimes termed the **Hook of the Cape,** is known as the **Lower Cape.** This section is well settled and composed almost entirely of sandy lands, with high, bare, sand hills, and low, nearly level plains.

Sandwich Harbor, 1 mile southeastward of the jetties at the entrance of Cape Cod Canal, is the approach to the town of **Sandwich** (P.O.). The shore in front of the town is low marsh, faced by a sand beach. In May 1959 the channel to the town was bare at low water. The harbor is suitable only for small craft; currents are weak and variable.

Springhill Beach extends 2.3 miles southeastward from Sandwich Harbor to Scorton Harbor. The latter harbor is surrounded by sand dunes backed by cultivated and settled lowlands.

Scorton Harbor, 3.5 miles southeastward of the entrance of Cape Cod Canal, has a narrow entrance, bare at low water. Small local fishing boats sometimes enter the harbor at half tide or higher. The harbor has no wharves. **Scorton Ledge,** an unmarked 12-foot ledge, is 0.7 mile north-northeastward of the entrance.

Chart 339.—Barnstable Harbor, 10 miles eastward of Cape Cod Canal entrance, is the approach to the town of **Barnstable** (P.O.), and the village of **Yarmouth Port** (P.O.). It is used mostly by local fishing boats and yachts. See Appendix for **storm warning** display. The entrance is obstructed by a shifting bar with about 5 feet over it. The harbor is nearly filled by flats and shoals which extend 2 miles off the entrance from the shore eastward of the light.

The channel into Barnstable Harbor is partially marked by buoys but the bar channel is subject to changes and strangers should obtain local information before entering. With northerly winds a heavy sea makes on the bar, and vessels bound to Barnstable should take shelter in the eastern entrance to Cape Cod Canal or anchor in Plymouth or Provincetown Harbors until the weather moderates. Ice generally obstructs the harbor during a part of the winter.

Tides and currents.—The mean range of tide is about 9.5 feet. Velocities of the tidal current in the entrance at strength average 1.3 knots, flooding southward and ebbing northward.

Beach Point Light (41°43.5′ N., 70°16.6′ W.), 46 feet above water and visible 8 miles, is shown from a white skeleton tower with white tank house on the eastern end of **Beach Point.** Two rectangular daymarks, painted red, are on the light structure; one facing the entrance channel and the other facing the inner harbor. A buoy about 280 yards southeastward of the light marks the outer extremity of the shoal extending southeastward from the point.

Prominent landmarks include the abandoned lighthouse tower on the south side of Beach Point; a standpipe and a lighted radio tower at Barnstable; and a tall stack, tank, and spire in Yarmouth.

In 1959 a 6-foot channel in **Maraspin Creek** led to a wharf at Barnstable. **Maraspin Creek Entrance Light,** about 0.2 mile northward of Blish Point, is maintained from May to November by the town of Barnstable. From the light to **Blish Point,** the channel was marked by bush stakes in 1959. A marine railway capable of hauling out boats up to 45 feet in length is at Barnstable. Gasoline and some supplies are available.

In May 1959 the channel to **Yarmouth** had shoaled over; it bares before low water.

North Dennis is a village 3.2 miles eastward of Beach Point Light. **Scargo Hill,** 170 feet high and the highest hill in the vicinity, is southeastward of North Dennis. A prominent stone lookout tower is on the hill.

Nobscusset Point, 4.2 miles eastward from Beach Point Light, has a small breakwater which formerly provided a limited anchorage for small craft, but in 1959 the area inside the breakwater was bare at low water.

Chart 581.—Between Barnstable and Wellfleet are several creeks which are used by local boats and launches at high water, but all of them are dry at low water. The 18-foot curve is from 0.2 to 0.3 mile from shore between North Dennis and Sesuit Harbor, but eastward of the latter it is 0.5 to 1.5 miles from shore.

Sesuit Harbor, about 5 miles eastward of Barnstable Harbor, has two jetties, the outer 100 yards of which are sunken. The harbor, about 0.5 mile long has been dredged, and in September 1958 the controlling depth in the entrance was 6½ feet. An outer anchorage basin between the jetties has depths of from 7 to 9 feet.

About 500 yards inside the end of the jetties, the channel narrows to a width of about 80 feet, where there is also a depth of 6½ feet. Here, on the west side of the channel, there is a yacht club, a town landing, and a boatyard with marine railway and boatsheds. The harbor continues for about 600 yards in an inner basin, which has from 6½ to 9 feet, and provides mooring place for fishing boats and pleasure craft. **East Dennis** (P.O.) is a village 0.5 mile inland.

Rock Harbor on the south side of **Rock Harbor Creek** is about 7 miles eastward of Sesuit Harbor. The entrance channel had a depth of 1 foot in 1959. A lighted bell buoy is about 1.8 miles westward of the entrance. A privately maintained lighted range marks the entrance. The front light is exhibited 12 feet above the water from a steel pole on the channelward end of a stone jetty. The rear light, 22 feet above the water, is 309 yards 100° from the front light.

A basin has been dredged in the creek. A long wharf, at which gasoline and diesel oil are available, is on the south bank. A marine railway is on the north bank. Boats usually enter and leave the harbor within 2 hours of high water.

A naval aircraft bombing target **danger area** is centered in 41°49′46″ N., 70°02′54″ W. on the hulk of the former liberty ship JAMES LONGSTREET; limits and **regulations** are given in **§ 204.4,** Chapter 2. The ship has been scuttled in 14 feet of water, with much of her hull showing above high water, about 2.5 miles northwestward of Rock Harbor. A lighted buoy is 250 yards westward of the hulk.

Wellfleet Harbor is on the western side of the hook of Cape Cod, near its southern end. Extensive shoals are in the entrance and extend about 5.5 miles westward of **Billingsgate Island,** marking the western side of the entrance to the harbor. The island is covered at high water. **Mayo Beach** is at the head of the harbor.

The channel into Wellfleet Harbor leads between the shoals and is narrow in places, but it is marked by buoys and is easily followed in daytime in clear weather. Several bush stakes mark the clam flats in the inner harbor. The harbor is usually closed by **ice** during a part of each winter.

A Federal project for Wellfleet Harbor provides for a channel 10 feet deep to the anchorage basin off the town landing at Wellfleet. In June 1958 the controlling depth was 10 feet. The inner harbor is protected by a breakwater, which is marked by a light.

Wellfleet (P.O.) is a town on the railroad and highway at the head of the harbor. Gasoline and limited small-boat chandlery are available. Water and power are available at the piers. There are several public floats in the harbor.

The inner harbor offers the best anchorage; the dredged basin south of Wellfleet town landing has depths of 6 to 10 feet. In the outer harbor, northeast of **Smalley Bar,** the anchorage in depths of from 12 to 21 feet is somewhat exposed in westerly winds. In northerly gales vessels sometimes anchor on the lee side of **Billingsgate Shoal** in 12 to 42 feet, the shoal breaking the sea so that vessels with good ground tackle can ride out a heavy gale from northward.

Tides and currents.—The mean range of tide is about 10 feet. The tidal currents are weak.

Chart 580.—Pamet River, about 7 miles northward of Billingsgate Island and Shoal, leads to the town of **Truro** (P.O.), and is used only by small boats. The river is used as a small-boat anchorage during a hurricane. The river must be entered over the bar at half tide or better. The shoals at the entrance are changeable. A shoal extends 1 mile off the entrance. Two small jetties are at the entrance.

Provincetown Harbor, formed by a turn in the northern end of the hook of Cape Cod, has a diameter of about 2 miles. It is one of the best harbors on the Atlantic Coast, having a sizable anchorage area in depths of 12 to 57 feet with excellent holding ground. Coasters and fishermen find protection here in gales from any direction. The historical town of **Provincetown** (P.O.) is on the northwestern side of the harbor. It is the home port of many vessels engaged in cod, mackerel, and other fishing. Coal, lumber, and some petroleum products make up the remainder of the shipping.

The approach and entrance to the harbor are free from dangers and are marked by three lights and by **Pilgrim Monument,** a slim stone structure about 350 feet above the water, which rises 252½ feet above **High Pole Hill. Race Point Light (42°03.7′ N., 70°14.6′ W.)** 41 feet above the water and visible 12 miles, is shown from a white tower, 40 feet high, on the northwest point of Cape Cod. The light station has a fog signal. A lighted bell buoy is 2 miles northwestward of the light. A Coast Guard station is 1.5 miles northeastward of the light.

Wood End Light (42°01.3′ N., 70°11.6′ W.), 45 feet above the water and visible 12 miles, is shown from a white square tower, 39 feet high, near the water on the southern end of the hook of the cape. The light station has a fog signal. **Long Point Light,** 36 feet above the water and visible 11 miles, is shown from a white square tower at the western point of the harbor entrance; a fog signal is at the light.

The tower and buildings of Race Point Coast Guard station are prominent from the north. At night Cape Cod Light will show over the land westward of it when approaching the entrance on certain bearings.

Excellent anchorage may be had in Provincetown Harbor. In addition, small craft sometimes anchor in **Herring Cove,** 0.8 mile south of Race Point Light. A temporary lee from easterly winds is found well inshore in depths of 10 to 24 feet.

The two **measured trial courses** between Race Point and Long Point Lights are the outer and inner Naval standardization courses for submarines which may be operating submerged while making trial runs in the Provincetown area. The outer course, a combined measured half nautical mile and a nautical mile on the bearing **311°16′,** is between Race Point and Wood End; the inner course, a measured nautical mile, on the bearing **225°57′,** is between Wood End and Long Point. Both courses are marked by buoys and shore ranges.

Caution.—Shipping should keep a sharp lookout for periscopes and avoid as far as possible navigation along or across the trial courses, as the submarines may or may not be escorted by surface vessels. Caution should also be exercised when navigating in the vicinity of Race Point, especially during periods of darkness and low

visibility, because of the numerous fishing craft which operate in the area.

Shank Painter Bar, which extends to a maximum distance of 0.6 mile offshore between Race Point and Wood End Lights, rises abruptly from deep water. **Wood End Bar** is the continuation of the shoal which makes sharply into Wood End. A bell buoy is about 0.6 mile southwestward of Wood End Light.

Tides and currents.—The mean range of the tide in Provincetown Harbor is about 9 feet.

About 1 mile west of Race Point the tidal current has a velocity of about 1 knot at strength. The flood sets southwestward and the ebb northeastward. Tide rips occur during heavy weather when the wind is against the current. Westward of the stretch of coast between Wood End and Race Point, the velocity at strength is about 1 knot. In this locality the ebb current sets northwesterly and the flood sets southeasterly. At the entrance and in the harbor the tidal currents have little velocity. The Tidal Current Tables should be consulted for current predictions.

Ice forms only in severe winters in the harbor, and then only for short periods. There are recorded cases of fields of ice being driven northward from the shallow harbors of Cape Cod Bay into the harbor so as to close it briefly, but such cases are rare. See Appendix for **storm warning** display.

The principal wharf is municipally owned and has depths of 13 feet along the face. Diesel oil and water are available at the town wharf. The **harbormaster** is usually on the town wharf. The Public Health Service maintains an outpatient office in the town.

There are two boatyards in Provincetown. Either can haul out boats up to 100 tons, but with a limiting draft of 8 to 11 feet, depending on the tide. All types of hull repairs can be made, and machine shop repairs can be made on short notice.

Bus service is available throughout the year and the railroad operates freight service. During summer months, July through Labor Day, daily steamer service is operated to Boston.

Chart 1208.—From Race Point the shore curves northeastward, eastward, and then southeastward to the **Highlands,** a total distance of about 9 miles, and is composed of bare sand hillocks of various heights. On approaching the Highlands the sand hills begin to be covered with brownish-looking growth of grass, and the land is higher. The pitch of the cape at this point shows a high bluff, on which stands Cape Cod Light. At the Highlands the shore may be safely approached as close as 0.5 mile, but the water shoals somewhat abruptly, and care must be taken not to go inside the 5-fathom curve.

Peaked Hill Bar, about 4.5 miles east-northeast of Race Point Light and 0.6 mile offshore, includes shoals covered by 14 and 16 feet. Vessels have grounded here, mainly because of failure to take soundings. This area should be given a berth of at least 2 miles. A lighted whistle buoy is about 2.5 miles off Peaked Hill Bar and about 5 miles northwestward of Cape Cod Light. Keeping in a depth of 20 fathoms will insure passing 2.5 to 3 miles off the eastern side of Cape Cod and will lead to the lighted whistle buoy off Peaked Hill Bar.

Between Race Point and Chatham Light tidal current velocities are generally less than 1 knot. Strengths of flood and ebb set northward and southward respectively along the coast. The time of current changes rapidly, strength of flood or ebb occurring about 2 hours later off Nauset Beach Light than off Chatham Light.

Cape Cod Light (42°02.4′ N., 70°03.7′ W.), 183 feet above the water and visible 20 miles, is shown from a white tower, 66 feet high, with covered way to the dwelling, situated on the brow of a hill of the Highlands. The light station has a radiobeacon and a fog signal. See Appendix for **storm warning** display.

Just northward of the light station is a reporting station by which vessels may communicate with Boston by using International Code signals. A stone crenellated tower on the summit of a hill, 0.5 mile south of the light is prominent.

The eastern side of Cape Cod is described in **United States Coast Pilot 2, Atlantic Coast, Cape Cod to Sandy Hook.**

APPENDIX

COAST AND GEODETIC SURVEY.—United States Coast Pilots, Tide Tables, Tidal Current Tables, and Tidal Current Charts: for sale by U.S. Coast and Geodetic Survey, Washington 25, D.C., also at its district offices and sales agencies, which are listed semiannually in the Notice to Mariners.

United States Coast Pilots:

1, Atlantic Coast, Eastport to Cape Cod, 1960.
2, Atlantic Coast, Cape Cod to Sandy Hook, 1950.
3, Atlantic Coast, Sandy Hook to Cape Henry, 1953.
4, Atlantic Coast, Cape Henry to Key West, 1959.
5, Gulf Coast, Puerto Rico, and Virgin Islands, 1958.
7, Pacific Coast, California, Oregon, Washington, and Hawaii, 1959
8, Southeast Alaska, Dixon Entrance to Yakutat Bay, 1952.
9, Alaska, Cape Spencer to Arctic Ocean, 1954.
Distances between United States Ports, 1938.

A Coast Pilot for which a supplement has been issued should not be used except with reference to the latest issue of its supplement. Supplements may be obtained from the U.S. Coast and Geodetic Survey, Washington 25, D.C., or any of its district offices.

Tide Tables:

Europe and West Coast of Africa.
East Coast, North and South America.
West Coast, North and South America.
Central and Western Pacific Ocean and Indian Ocean.

Tidal Current Tables:

Atlantic Coast, North America.
Pacific Coast, North America and Asia.

Tidal Current Charts:

Boston Harbor (1949).
Narragansett Bay to Nantucket Sound (1955).
Long Island Sound and Block Island Sound (1954).
New York Harbor (1956).
Delaware Bay and River (1948).
Tampa Bay (1951).
San Francisco Bay (1947).
Puget Sound, Northern Part (1952).
Puget Sound, Southern Part (1948).

District Office.—Boston District, 10th floor, U.S. Customhouse, Boston 9, Mass. The Boston District includes all of the States of Maine, New Hampshire, Vermont, Massachusetts, and Rhode Island.

Coast and Geodetic Survey Sales Agents.—Agents marked with an asterisk (*) also handle certain U.S. Navy Hydrographic Office publications, and those marked with a dagger (†) also handle certain U.S. Coast Guard publications.

Maine:

Bar Harbor: †Frenchmans Bay Boating Co.
Bath: Shaw's Book Store, 49 Front St.
Boothbay Harbor: †Marine Service & Co., Inc., Commercial St.
Brunswick: Pine Tree Enterprises, 150 Maine St.
Camden: The Village Shop, 25 Main St.
Damariscotta: Tukey's Arts & Crafts.
Eastport: S. L. Wadsworth & Son, 5–8 Central Wharf.
Machias: Western Auto Associate Store.
Northeast Harbor: F. T. Brown.
Portland: *The Harris Co., 188 Commercial St.
Robinhood: Robinhood Marina, Inc.
Rockland: †Huston-Tuttle Book Co., 408 Main St.
South Freeport: South Freeport Yacht Basin, Inc.
Southwest Harbor: †Manset Marine Supply Co.
Stonington: †Atlantic Avenue Hardware, Inc.

New Hampshire:

Portsmouth: W. S. Jackson, 111 Market St.

Massachusetts:

Arlington: Delano's Corsi Marine Service, Inc., 144 Mystic St.
Beverly Farms: Ski & Sea Sports Store, Inc., 8 West St.
Boston: †Coast and Geodetic Survey District Office, 10th floor, Customhouse; Berry Hardware Co., 395 Neponset Ave.; †Marine Hardware & Supply Co., 390 Atlantic Ave.; *James Bliss & Co., Inc., 342 Atlantic Ave.; Weems Hughes & Plath Navigation, Inc., 33–35 India St.
Barnstable: Barnstable Marine Service, Inc., Freezer Rd.
Brockton: Wetzell's Sport & Marine Shop, 644 Belmont St.
Gloucester: *†George K. Rogers Co., 150 Main St.
Haverhill: Porro's Marine Co., 491 Amesbury Rd.
Hingham: The Ships Store, Inc., 69 Water St.
Marblehead: *†Fred L. Woods, Jr., 76 Washington St.
Marion: Barden's Boat Yard.
Medford: Russo's Marine Mart, Inc., 227 Salem St.
Newbury: Harold R. Turner Co., Rte. 1A, Parker River.
Newburyport: Newburyport Marine Supply, Inc., P. O. Box 349.
North Quincy: Boston Harbor Marina, Inc., 542 E. Squantum St.
Norwood: Norwood Marine, Inc., 866 Route 1.
Plymouth: Mayflower Marine Service, Inc., Town Wharf.
Provincetown: Land's End Marine Supply Co., Inc., 337 Commercial St.
Rockport: Building Center Stores, 18 Railroad Ave.
Salem: Jaynes Auto & Marine Supply, 77 Bridge St.
South Dartmouth: The Packet, Inc., 56 Elm St.
Stoughton: Corcoran, Inc.

PUBLICATIONS.—A resumé of the U.S. Government publications of navigational value is included for the ready reference of the mariner. In addition to the agents located in the principal seaports handling sales publications, certain libraries have been designated by the Congress of the United States to receive the publications as issued for public review.

Nautical Charts.—United States coastal waters (Chart No. 1, a pamphlet, is Nautical Chart Symbols and Abbreviations): Published by U.S. Coast and Geodetic Survey; for sale by C&GS and its sales agents.

Mississippi River (Cairo, Ill., to Gulf of Mexico): Published and for sale by Mississippi River Commission, Vicksburg, Miss.

Mississippi River (Cairo, Ill., to Minneapolis, Minn.) and Illinois Waterway (Mississippi River to Lake Michigan): published and for sale by U.S. Army Engineer District, Chicago, Ill.

Great Lakes, Lake Champlain, New York State Canals, and the St. Lawrence River-St. Regis to Cornwall, Canada: Published and for sale by U.S. Lake Survey, Detroit, Mich.

Foreign countries: Published by U.S. Navy Hydrographic Office; for sale by H.O. and its sales agents.

Coast Pilots.—Coasts of the United States and Possessions: Published by U.S. Coast and Geodetic Survey; for sale by C&GS and its sales agents.

Great Lakes (Great Lakes Pilot): Published and for sale by U.S. Lake Survey, Detroit, Mich.

Foreign countries (Sailing Directions): Published by U.S. Navy Hydrographic Office; for sale by H.O. and its sales agents.

Tide and Tidal Current Tables, and Tidal Current Charts.—Published by U.S. Coast and Geodetic Survey; for sale by C&GS and its sales agents.

Notices to Mariners may be obtained free from the following: Local Notices to Mariners—District Commander of the local Coast Guard district; Weekly Notice to Mariners, Part I (Western Hemisphere Edition)—Commandant, U.S. Coast Guard; Weekly Notice to Mariners, Part II (Eastern Hemisphere Edition)—U.S. Navy Hydrographic Office; Weekly Notice to Mariners, Great Lakes—Commander, Ninth Coast Guard District, Cleveland, Ohio.

Light Lists.—United States and Possessions: Published by the Coast Guard; for sale by the Superintendent of Documents and his sales agents.

Foreign countries: Published by U.S. Navy Hydrographic Office; for sale by H.O. and it sales agents.

Radio.—Radio Navigational Aids (H.O. Pub. No. 205), Radio Weather Aids (H.O. Pub. No. 206), Weather station Index (H.O. Pub. No. 207), and International Code of Signals, Vol. II. Radio (H.O. Pub. No. 88): Published by U.S. Navy Hydrographic Office; for sale by H.O. and its sales agents.

Miscellaneous.—American Nautical Almanac and American Ephemeris and Nautical Almanac: Published by United States Naval Observatory; for sale by Superintendent of Documents and his sales agents.

American Practical Navigator (Bowditch) (H.O. Publication No. 9), and International Code of Signals, Volume I—Visual (H.O. Publication No. 87): Published by U.S. Navy Hydrographic Office; for sale by H.O. and its sales agents.

Rules of the Road, International—Inland (CG-169), Rules of the Road, Western Rivers (CG-184), Rules of the Road, Great Lakes (CG-172): Published by and free on application to the U.S. Coast Guard.

Port Series of the United States: Prepared by the Corps of Engineers, U.S. Army, in cooperation with the Maritime Adminitration, U.S. Department of Commerce; for sale by the Superintendent of Documents.

CORPS OF ENGINEERS, U.S. ARMY.—New England Division office, 424 Trapelo Rd., Waltham 54, Mass.

The New England Division, an operating division with both district and division functions, comprises all of New England except western Vermont and small portions of Massachusetts and Connecticut along their western boundaries, and includes small portions of southeastern New York, all embraced in the drainage basins tributary to Long Island Sound and the Atlantic Ocean east of the New York-Connecticut State line. It also includes Fishers Island, N.Y.

COAST GUARD.—Commander, First District. The First Coast Guard District, with district office at 1400 Customhouse, Boston 9, Mass., shall comprise: Maine; New Hampshire; Vermont, except the counties of Orleans, Franklin, Grand Isle, Chittenden, and Addison; Massachusetts; Rhode Island, with the exception of Watch Hill Light station; all United States naval reservations on shore in Newfoundland; the ocean area north of a line from Watch Hill Light south to Montauk Point Light, thence 112° T.

Captain of the Port Offices and Port Areas:

Captain of the Port Office, 427 Commercial Street, Boston 13, Mass. All navigable waters of the United States and contiguous land areas within the following boundaries: On the east the 70°50′00″ W. meridian, on the south the 42°13′00″ N. parallel, on the west the 71°05′00″ W. meridian, and on the north the 42°25′00″ N. parallel.

Captain of the Port Office, 259 High Street, South Portland 7, Maine. All navigable waters of the United States and contiguous land areas within the following boundaries: A line extending from Cape Elizabeth Light in a northeasterly direction to Halfway Rock Light, thence north to 43°50′00″ N., 70°02′15″ W., in Maquoit Bay, thence west to 43°50′00″ N., 70°19′00″ W., thence south to 43°34′00″ N., thence easterly to Cape Elizabeth Light.

Lifeboat Stations.—The lifeboat stations operated by the Coast Guard in the areas covered by this Coast Pilot are:

Quoddy Head, Me. (No. 1), 44°48.8′ N., 66°58.0′ W. About 0.75 mile west of West Quoddy Head Light.

Cross Island, Me. (No. 2), 44°36.9′ N., 67°16.8′ W. Northeast end of Cross Island; east entrance to Machias Bay.

Moose Peak, Me. (No. 4), 44°28.5′ N., 67°32.0′ W. On east point of Mistake Island, at Moose Peak Light.

Southwest Harbor, Me. (No. 5), 44°16.5′ N., 68°18.7′ W. South side end of Clark Point, Southwest Harbor.

Rockland, Me. (No. 6), 44°06.2′ N., 69°06.1′ W. West side of Rockland Harbor.

Burnt Island, Me. (No. 7), 43°52.3′ N., 69°17.3′ W. North side of Burnt Island off mouth of St. George River.

Kennebec River, Me. (No. 9), 43°45.0′ N., 69°46.9′ W. West side of mouth of Kennebec River.

Cape Elizabeth, Me. (No. 10), 43°34.0′ N., 70°12.0′ W. Southeast point of Cape Elizabeth, near Cape Elizabeth Light.

Fletchers Neck, Me. (No. 11), 43°26.5′ N., 70°30.5′ W. Southeast end of Fletchers Neck.

Portsmouth, N.H. (No. 12), 43°04.2′ N., 70°42.5′ W. On Newcastle Island, at Portsmouth Harbor Light.

Hampton Beach, N.H. (No. 16), 42°56.3′ N., 70°47.7′ W. About 1.5 miles north of Great Boars Head.

Merrimack River, Mass. (No. 20), 42°48.9′ N., 70°48.6′ W. North end of Plum Island, east of Newburyport Harbor Light on south side of river.

Straitsmouth, Mass. (No. 22), 42°39.5′ N., 70°35.9′ W. About 0.5 mile southwest of Straitsmouth Light.

Gloucester, Mass. (No. 23), 42°35.5′ N., 70°41.2′ W. West side of Gloucester Harbor, on Oldhouse Cove.

Nahant, Mass. (No. 24), 42°25.9′ N., 70°56.1′ W. On neck between Little Nahant and Nahant.

Point Allerton, Mass. (No. 26), 42°18.3′ N., 70°54.0′ W. One mile west of Point Allerton, on Stony Beach.

Scituate, Mass. (No. 27), 42°12.0′ N., 70°43.0′ W. On southern shore of Scituate Harbor.

Cape Cod Canal, Mass. (No. 32), 41°46.5′ N., 70°30.0′ W. East entrance to canal, near Sandwich, Mass.

Race Point, Mass. (No. 34), 42°04.7′ N., 70°13.5′ W. About 1.5 miles northeast of Race Point Light.

CUSTOMS DISTRICTS.—The first port listed in each district is the headquarters port.

Maine District: The limits are the States of Maine and New Hampshire. Ports of entry where marine documents are issued: Portland, 312 Fore St.; Calais, Eastport, Jonesport, Bar Harbor, Bangor, Federal Bldg.; Belfast, Bath, Rockland, Federal Bldg.; Portsmouth, U.S. Post Office Bldg., State & Pleasant Sts.

Massachusetts District: The limits are the State of Massachusetts. Ports of entry where marine documents are issued: Boston, 2 India St.; Gloucester, U.S. Post Office Bldg.; Plymouth, Post Office Bldg., Main St.; and Salem.

PUBLIC HEALTH SERVICE.—Quarantine stations where supervision of quarantine and medical examination of aliens are performed:

Boston, Mass.; 5th floor, Sec. A East, Boston Army Base, 666 Summer St.

Additional ports of entry at which quarantine inspection and/or medical examination of aliens are performed:

Calais, Bar Harbor, Bucksport, Bangor, Searsport, Belfast, Wiscasset, Harpswell, Portland, Me.; Portsmouth, N.H.; Gloucester, Salem, Everett, Chelsea, Quincy, Braintree, Weymouth, Hingham, Plymouth, Provincetown, Mass.

Hospital:

Boston, Mass.: 77 Warren Street (Brighton)

Outpatient clinic:

Portland, Me.: 331 Veranda Street.

Outpatient Offices:

Bath, Me., 118 Front St.; East Machias, Me., High St.; Gloucester, Mass., 63 Middle St.; Provincetown, Mass., 322 Commercial St.

IMMIGRATION and NATURALIZATION.—Offices of these services are in the following ports covered by this Coast Pilot:

Calais, Me.: 1 Main St.
Eastport, Me.: Maybee Wharf.
Bangor, Me.: Post Office Bldg.
Portland, Me.: 316 U.S. Courthouse.
Boston, Mass.: 150 Tremont St., Boston 7.

FEDERAL COMMUNICATIONS COMMISSION.—There is one district field office in the area covered by this Coast Pilot:

Boston: Customhouse, Boston, Mass.

LEGAL HOLIDAYS.—In the area covered by this Coast Pilot, the following holidays are observed throughout:

January 1, New Year's Day; February 22, Washington's Birthday; May 30, Memorial Day; July 4, Independence Day; Labor Day; November 11, Veterans Day; Thanksgiving Day; December 25, Christmas Day.

In addition, these holidays are observed as indicated: October 12, Columbus Day, in Massachusetts and New Hampshire; General Election Day, first Tuesday after first Monday in November, in Maine and New Hampshire; March 17, Evacuation Day, and June 17, Bunker Hill Day in Boston and Suffolk County, Mass.; April 19, Patriots' Day, in Maine and Massachusetts; Fast Day, fourth Monday in April, in New Hampshire.

YACHT CLUBS.—Yacht clubs in the area covered by this Coast Pilot include:

Maine:

Arundel Yacht Club, Inc., Kennebunkport.
Augusta Yacht Club, Augusta.
Bar Harbor Yacht Club, Inc., Canoe Point, Bar Harbor.
Biddeford Pool Yacht Club, Biddeford Pool.
Blue Hill (Kollgewidgwok) Yacht Club, Blue Hill.
Boothbay Harbor Yacht Club, 10 Commercial St., Boothbay Harbor.
Bucks Harbor Yacht Club, South Brooksville.

Burleigh Hill Yacht Club, Boothbay.
Camden Yacht Club, Camden.
Castine Yacht Club, Castine.
Center Harbor Yacht Club, Brooklin.
Deer Isle Yacht Club, Sylvesters Cove, Deer Isle.
Harraseeket Yacht Club, South Freeport.
Kennebunk River Yacht Club, Kennebunkport.
Maine Maritime Academy Yacht Club, Castine.
Mere Point Yacht Club, Mere Point.
Mt. Desert Yacht Club, Somesville, Mt. Desert.
North Haven Yacht Club, North Haven.
Northeast Harbor Fleet, The, Gilpatrick Cove, Mt. Desert Id.
Northport Yacht Club (Maine Sailing School), Northport Wharf.
Orrs-Bailey Yacht Club.
Portland Yacht Club, Falmouth Foreside.
Prouts Neck Yacht Club, Scarboro.
Rockland Community Yacht Club, foot Pleasant St., Rockland.
Rockport Yacht Club, Rockport.
St. Croix Boat Club, Todd Point.
Schoodic Yacht Club, Calais, Red Beach.
Seal Harbor Yacht Club, Seal Harbor.
Sorrento Yacht Club, Sorrento.
Southport Yacht Club, West Southport.
Tarrantine Club, The; Ames Cove, Dark Harbor.
Twin Village Yacht Club, Newcastle.
Winter Harbor Yacht Club, Sand Cove, Winter Harbor.
Wiscasset Yacht Club, Wicasset.

New Hampshire:

Great Bay Yacht Club, Durham.
Kittery Point Yacht Club, Frisbee's Wharf, Kittery Point.
Pepperell Cove Yacht Club, Kittery.
Portsmouth Yacht Club, New Castle.

Massachusetts:

American Yacht Club, Merrimack River, Newburyport.
Atlantic Sailing Club, Marblehead.
Beachmont Yacht Club, Pearl Ave., Revere.
Beverly Yacht Club, Marion.
Boston Yacht Club, 5 Rowe's Wharf, Boston.
Boston Yacht Club, Marblehead.
Bunker Hill Yacht Club, Charlestown.
Charles River Yacht Club, Cambridge.
Charlesgate Yacht Club, Cambridge.
Chelsea Yacht Club, Broadway, Chelsea.
Cohasset Yacht Club, Cohasset.
Coles River Yacht Club, Touisset-Swansea.
Columbia Yacht Club, 1825 Columbia Rd., So. Boston.
Conomo Point Yacht Club, Essex.
Corinthian Yacht Club of Marblehead, Marblehead Neck.
Cottage Park Yacht Club, Winthrop.
Dorchester Yacht Club, 320 Freeport, Dorchester.
Duxbury Yacht Club, Duxbury.
East Boston Yacht Club.
Eastern Point Yacht Club, Gloucester.
Eastern Yacht Club, Marblehead.
Harvard Yacht Club, 60 Boylston St., Cambridge.
Hingham Yacht Club, Crow Point, Hingham.
Ipswich Bay Yacht Club, Great Neck, Ipswich.
Jeffries Yacht Club, East Boston.
Jubilee Yacht Club, Beverly Harbor.
Lowell Motor Boat Club, 487 Pawtucket St., Lowell.
Lynn Yacht Club, Lynn.
Manchester Harbor Boat Club, Manchester.
Manchester Yacht Club, Tucks Point, Manchester.
Marblehead Harbor Yacht Club, 1A Front St., Marblehead.
Marblehead Yacht Club, 4 Cliff St., Marblehead.
Marshfield Boat Club, Inc., Marshfield.
Medford Boat Club, Medford.
Metropolitan Yacht Club, Inc., Arborway Dr., E. Braintree.
Merrymount Yacht Club, Wollaston.
Milton Yacht Club, Milton.
Nahant Dory Club, 5 Wharf St., Nahant.
Neponsent Valley Yacht Club, Grande Ave. Bridge, Milton.
North End Yacht Club, Newburyport.
Old Colony Yacht Club, Dorcester.
Old Town Yacht & Country Club, Parker River.
Orient Heights Yacht Club, East Boston.
Palmer's Cove Yacht Club, Inc., Salem.
Pleasant Park Yacht Club, Winthrop.
Pleon Yacht Club, Marblehead Neck, Marblehead.
Plymouth Yacht Club, Union St., Plymouth.
Point of Pines Yacht Club, Revere.
Port Norfolk Yacht Club, Neponset.
Provincetown Yacht & Tennis Club, Provincetown.
Puritan Yacht Club, Boston.
Quarterdeck Yacht Club, Marblehead.
Quincy Yacht Club, Houghs Neck, Quincy.
Salem Willows Yacht Club, Salem.
Sandy Bay Yacht Club, T-wharf, Rockport.
Saugus River Yacht Club, Lynn.
Savin Hill Yacht Club, Savin Hill, Dorchester.
Scituate Harbor Yacht Club, Scituate.
Scituate Yacht Club, Scituate.
South Boston Yacht Club, 1849 Columbia Rd., So. Boston.
Springfield Yacht & Canoe Club, 1210 River Rd., Agawam.
Squantum Yacht Club, 646 Quincy Shore Dr., Wollaston.
Swampscott Yacht Club, Swampscott.
T-wharf Yacht Club, Boston.
Tennis & Racquet Club Yacht Squadron, Boston.
Town River Yacht Club, Quincy.
United Shoe Yacht Club, Beverly.
Watertown Yacht Club, Inc., Watertown.
Wellfleet Yacht Club, Cape Cod.
Wessagussett Yacht Club, North Weymouth.
Winchester Boat Club, Winchester.
Winter Hill Yacht Club, 585 Mystic Ave., Sommerville.
Winthrop Yacht Club, 649 Shirley St., Winthrop.
Wollaston Yacht Club, Foot Beach St., Wollaston.

WEATHER BUREAU.—Offices: Barometers may be compared with standards at the following offices:
Boston, Mass., Logan International Airport.
Portland, Maine, City Airport.

Radiotelephone Broadcasts of Weather Information—Regular broadcasts of weather forecasts and storm warnings covering coastal waters Eastport, Maine, to Block Island, R.I., and also for waters north of Lat. 40° N. and west of Long. 60° W., are made by the following commercial coastal harbor stations in plain language. Coastal warnings are broadcast on receipt and at intervals thereafter while in effect. Regular scheduled times:

WOU, Boston, Mass., 2506, 2450 kcs.; 0520, 0620, 1120, 1720, 2320 EST., on receipt and at 20 minutes past odd hours while in effect.

NOTE: Special forecasts applicable to small-boat areas, Eastport to Portsmouth, South of Portsmouth to Chatham, South of Chatham and Buzzards Bay, are included April 1 to October 31.

Radiotelephone Broadcasts by the Coast Guard: Important notices to mariners, hydrographic information, storm warnings, advisories, and other urgent marine information are broadcast at scheduled times on indicated frequencies. Emergency broadcasts are made immediately following receipt of the information by the radio station; the information will be repeated on the next scheduled broadcast unless canceled or superseded.

NMF, Boston, Mass., warnings on receipt on 2182 kc., and at 1120 or 2320 EST on 2694 kc.

Radiotelegraph Broadcasts by Coast Guard—Storm and hurricane warnings, advisories, and other urgent marine information are broadcast by radiotelegraph at the scheduled times and indicated frequencies, preceded by an initial call on 500 kc. Emergency broadcasts are made during the first silent period after receipt.

NMF, Boston, Mass., 472 kc., warnings and forecasts for Eastport, Me. to Block Island, R.I., and waters north of Lat. 40° N. and west of Long. 60° W. at 1150 EST, warnings and forecasts for Eastport, Me. to Block Island, R.I. at 1950 EST. Warnings at 18 or 48 minutes past the hour while in effect.

NOTE: Special forecasts applicable to small-boat areas, Buzzards Bay, Eastport to Portsmouth, South of Portsmouth to Chatham and South of Chatham, are included April 1 to October 31.

Radiotelegraph Broadcasts by Commercial Station.—One commercial station in this area broadcasts marine information, as follows:

WCC, Boston, Mass., 436 kc., 2036 kc., 6505.5 kc., storm warnings and forecasts for Eastport, Maine to Block Island, R.I., and Block Island, R.I. to Cape May, N.J., Cape May, N.J. to Cape Hatteras, N.C., 0750, 1150 and 1950 EST. Local weather at Sandy Hook included at midnight and 0750 EST. Warnings on receipt on 436 kc., 2036 kc., 4268 kc. (nighttime only), 6505.5 kc., 8586 kc., 12925.5 kc., and 17271.2 kc. (daytime only).

Weather Broadcasts by Commercial Radio Stations.—The following commercial radio stations make direct or taped weather broadcasts from nearby Weather Bureau offices on eastern standard time schedules indicated.

All Maine stations include weather forecasts and warnings for coastal waters Eastport, Maine to Block Island, R.I., as well as special forecasts for small-boat waters, Eastport, Maine, to Portsmouth, N.H., during the period April 1 to October 31. Massachusetts radio stations include forecasts and warnings applicable to coastal waters, Eastport, Maine to Cape May, N.J., also special forecasts for small-boat areas, Eastport, Maine, to Portsmouth, N.H., South of Portsmouth, N.H. to Chatham, Mass., South of Chatham, Mass., and also Buzzards Bay, during the period April 1 to October 31.

Augusta, Maine, WRDO, 1400 kc., 0755 weekdays and Saturdays; 1830 weekdays.

Bangor, Maine, WLBZ, 620 kc., 1855 weekdays and Saturdays.

Lewiston, Maine, WLAM, 1470 kc., 0755 weekdays and Saturdays.

Portland, Maine, WCSH, 970 kc., 0725 and 1825 weekdays and Saturdays; 0825 Sundays.

Waterville, Maine, WTVL, 1490 kc., 0735 weekdays and Saturdays.

Boston, Mass., WHDH, 850 kc., 0735, 1255, 1825 and 2305 weekdays and Saturdays; 0955 Sundays.

Storm Warning Stations.—Weather Bureau listing of the display stations in the area covered by this Coast Pilot follow. **DN** indicates day and night display; **D**, day display only; **N**, night display only.

Maine:

DN Eastport; 44°54.5′, 66°59.3′.
D Machiasport; 44°41.9′, 67°24.0′.
D Cross Island Lifeboat Station; 44°36.9′, 67°16.8′.
D Moose Peak Lifeboat Station; 44°28.5′, 67°31.9′.
D Southwest Harbor Depot; 44°16.5′, 68°18.8′.
D Rockland Lifeboat Station; 44°06.3′, 69°06.1′.
D Owls Head Light Station; 44°05.5′, 69°02.7′.
DN Marshall Point Light Station; 43°55.0′, 69°15.7′.
DN Boothbay Harbor; 43°51.3′, 69°37.7′.
D Kennebec River Lifeboat Station; 43°45.0′, 69°46.9′.
DN South Portland Coast Guard Base; 43°38.7′, 70°15.0′.
DN Cape Elizabeth Lifeboat Station; 43°34.0′, 70°12.0′.
D Portland Lightship; 43°31.5′, 70°05.5′.
D Fletchers Neck Lifeboat Station; 43°26.5′, 70°20.5′.

New Hampshire:

DN Portsmouth Harbor Light; 43°04.3′, 70°42.6′.

Massachusetts:

DN Merrimack River Lifeboat Station; 42°48.9′, 70°48.6′.
D Newbury: 42°45.7′, 70°50.8′.
DN Straitsmouth Lifeboat Station; 42°39.5′, 70°35.9′.
DN Eastern Point Light Station; 42°34.8′, 70°39.9′.
D Beverly; 42°32.4′, 70°52.3′.
D Coast Guard Air Station, Salem; 42°31.6′, 70°52.2′.
DN Marblehead; 42°30.5′, 70°50.5′.
D Nahant Lifeboat Station; 42°25.8′, 70°56.1′.
D Boston Lifeboat Station; 42°22.1′, 71°03.1′.
D Cambridge (Yacht Club); 42°21.6′, 71°05.1′.
N Boston Customhouse; 42°21.5′, 71°03.2′.

D Deer Island Light Station; 42°20.4′, 70°57.3′.
D Boston Lightship; 42°20.4′, 70°45.5′.
D Point Allerton Lifeboat Station; 42°18.4′, 70°54.0′.
DN Dorchester (Yacht Club); 42°18.0′, 71°02.7′.
D Hingham Yacht Club; 42°15.7′, 70°53.7′.
D Scituate Lifeboat Station; 42°11.9′, 70°43.0′.
D Scituate Fourth Cliff; 42°09.7′, 70°42.5′.
D Plymouth Light Station; 42°00.2′, 70°36.1′.
DN Cape Cod Canal Lifeboat Station; 41°46.4′, 70°30.0′.
D Barnstable; 41°42.5′, 70°18.5′.
5 DN Provincetown; 42°03.1′, 70°11.3′.
DN Cape Cod Light Station; 42°02.4′, 70°03.7′.

CLIMATOLOGICAL TABLES

These tables were compiled from U. S. Weather Bureau data.

Sky cover is expressed in a range of 0 for no clouds to 10 for complete sky cover. The number of clear days is based on average cloudiness of 0 to 3, partly cloudy days on 4 to 7, and cloudy days on 8 to 10.

Heavy fog includes data referred to at various times in the past as "Dense" or "Thick." The upper visibility limit for heavy fog is 1/4 mile.

(a) means length of record in years.
* means less than one-half.
T means trace, an amount too small to measure.

EASTPORT, MAINE (Post Office Building) 44°54' N., 66°59' W. Elevation (ground) 33 feet. WB-1952

Month	Air temperature (°F.) Normal: Daily maximum	Daily minimum	Monthly	Extreme: Record highest	Record lowest	Precipitation (inches): Normal total	Maximum in 24 hrs.	Snow, sleet, mean total	Humidity (percent): 7:30 a.m. EST	1:30 p.m. EST	Wind (knots): Mean speed	Prevailing direction	Maximum speed and direction	Percent of possible sunshine	Mean sky cover sunrise to sunset	Mean number of days: Sunrise to sunset: Clear	Partly cloudy	Cloudy	Precipitation .01 inch or more	Snow, sleet 1.0 inch or more	Thunderstorms	Heavy fog
(a)				80	80	80	72	68	65	34	67		80	59	63	71	71	71	80	60	67	67
Jan.	29.0	13.3	21.2	58	-20	3.66	3.02	16.9	74	72	11.7		61 SE	45	6.6	8	8	15	15	5	*	2
Feb.	28.9	14.2	21.7	54	-23	3.23	3.17	18.6	74	70	11.6		59 N	50	6.2	8	7	13	13	5	*	2
Mar.	36.1	23.4	29.8	76	-10	3.61	3.18	12.8	75	69	10.9		53 E	52	6.3	8	9	14	14	4	*	3
Apr.	45.4	32.6	39.0	81	2	2.86	2.75	6.6	77	71	9.9		52 E	51	6.5	7	9	14	12	2	*	4
May	55.2	40.4	47.8	90	24	2.96	5.48	0.2	79	71	8.4		49 SE	52	6.6	7	11	13	12	*	1	6
June	64.5	47.0	55.2	92	30	3.06	3.30	0.0	82	75	7.3		43 E	54	6.6	6	12	12	12	0	3	8
July	69.0	52.1	60.5	93	45	3.11	5.24	0.0	85	77	6.5		53 NW	56	6.2	7	13	11	12	0	4	12
Aug.	68.5	53.1	60.7	93	44	3.01	4.18	0.0	85	76	6.4		44 NE	57	6.0	9	11	11	11	0	3	10
Sep.	62.9	49.3	56.0	92	30	3.04	3.66	0.0	84	75	7.5		41 NE	55	6.0	9	9	12	11	0	1	6
Oct.	54.0	41.7	47.8	83	22	3.48	5.33	0.2	81	72	9.3		66 E	50	6.2	8	9	14	11	*	1	4
Nov.	43.3	31.7	37.4	67	-13	3.68	3.69	4.0	80	75	10.3		66 NE	38	7.2	5	8	17	12	3	*	2
Dec.	32.7	18.8	25.2	60	-23	3.54	3.74	12.3	77	73	11.2		72 E	40	6.9	7	8	16	14	4	*	1
Year	49.1	34.8	42.0	93	-23	39.24	5.48	71.6	79	73	9.3		72 E	51	6.4	89	114	162	149	23	13	60

PORTLAND, MAINE (City Airport) 43°39' N., 70°19' W. Elevation (ground) 61 feet. WB-1958

Month	Air temperature (°F.) Normal: Daily maximum	Daily minimum	Monthly	Extreme: Record highest	Record lowest	Precipitation (inches): Normal total	Maximum in 24 hrs.	Snow, sleet, mean total	Humidity (percent): 7 a.m. EST	1 p.m. EST	Wind (knots): Mean speed	Prevailing direction	Maximum speed and direction	Percent of possible sunshine	Mean sky cover sunrise to sunset	Mean number of days: Sunrise to sunset: Clear	Partly cloudy	Cloudy	Precipitation .01 inch or more	Snow, sleet 1.0 inch or more	Thunderstorms	Heavy fog
(a)				18	18		18	18	18	18	18	18	18	18	15	18	18	18	18	18	18	18
Jan.	30.7	10.6	20.7	64	-21	4.43	1.89	20.2	81	65	8.2	N	43 SE	54	6.5	10	7	14	12	5	0	3
Feb.	31.6	11.3	21.5	64	-39	3.83	2.66	18.2	80	61	8.4	N	50 N	61	5.9	10	7	11	11	4	*	2
Mar.	41.0	21.9	31.9	86	-21	4.03	3.47	12.9	77	60	8.9	N	66 NE	58	6.0	10	7	14	11	3	1	4
Apr.	51.8	31.9	41.9	85	8	3.75	2.43	2.3	74	57	8.9	S	49 S	57	6.5	9	7	14	12	1	1	3
May	62.6	42.0	52.3	92	23	3.36	2.33	0.4	75	59	8.0	S	43 NW	56	6.6	7	9	15	14	*	2	6
June	72.6	51.0	61.8	97	33	3.32	2.17	0.0	77	60	7.1	S	32 E	63	6.1	8	10	12	12	0	5	5
July	78.7	56.9	67.8	98	41	2.83	2.23	0.0	79	58	6.6	S	38 W	67	5.9	9	11	11	9	0	5	7
Aug.	77.4	55.3	66.4	100	38	2.59	4.18	0.0	83	58	6.6	S	60 E	66	5.5	11	11	9	9	0	3	5
Sep.	69.7	47.4	58.6	95	23	3.08	7.49	0.0	86	61	6.9	S	52 NW	63	5.4	12	7	11	8	0	2	6
Oct.	59.6	37.2	48.4	87	18	2.98	3.10	T	85	60	7.6	N	38 SE	60	5.3	12	8	11	9	0	*	5
Nov.	47.1	27.8	37.5	73	6	3.79	3.39	3.1	85	64	7.8	W	66 NE	49	6.4	9	7	14	11	1	*	4
Dec.	34.5	15.7	25.1	60	-15	3.79	3.56	11.3	81	62	8.0	WSW	54 SE	53	6.3	10	8	13	11	3	*	2
Year	54.8	34.1	44.5	100	-39	41.78	7.49	68.4	80	60	7.7	S	66 NE	59	6.0	117	99	149	129	17	19	52

BOSTON, MASS. (Logan International Airport) 42°22' N., 71°01' W. Elevation (ground) 15 feet. WB-1958

Month	Air temperature (°F.) Normal: Daily maximum	Daily minimum	Monthly	Extreme: Record highest	Record lowest	Precipitation (inches): Normal total	Maximum in 24 hrs.	Snow, sleet, mean total	Humidity (percent): 7 a.m. EST	1 p.m. EST	Wind (knots): Mean speed	Prevailing direction	Maximum speed and direction	Percent of possible sunshine	Mean sky cover sunrise to sunset	Mean number of days: Sunrise to sunset: Clear	Partly cloudy	Cloudy	Precipitation .01 inch or more	Snow, sleet 1.0 inch or more	Thunderstorms	Heavy fog
(a)							88	87	68	21	23	10	40	65	19	88	88	88	88	68	66	66
Jan.	36.5	21.6	29.1	72	-13	3.50	3.25	12.0	71	59	11.5	NW	57 SW	49	6.4	9	8	14	12	4	*	2
Feb.	36.5	21.8	29.2	68	-18	2.93	4.45	12.4	69	58	11.9	WNW	50 NE	56	6.1	9	8	11	11	3	*	1
Mar.	45.2	30.0	37.6	86	-8	3.43	3.10	7.4	69	55	12.0	NW	63 E	57	6.2	10	9	12	12	2	1	2
Apr.	54.9	39.4	47.2	89	11	3.46	3.19	1.8	68	53	11.7	SW	55 NE	57	6.5	9	9	12	11	*	1	1
May	66.3	49.3	57.8	97	31	2.91	5.74	T	69	55	10.4	SW	48 W	59	6.7	8	12	11	11	0	2	1
June	75.9	58.4	67.2	100	41	3.48	5.35	0.0	71	56	9.8	SW	40 NW	63	6.2	9	11	10	10	0	4	1
July	80.0	64.3	72.2	104	50	3.18	6.04	0.0	72	55	8.9	SW	45 NW	64	6.1	8	13	10	10	0	5	2
Aug.	79.4	63.5	71.5	101	46	3.23	8.40	0.0	73	56	8.9	SW	45 NE	64	5.5	11	11	9	10	0	4	1
Sep.	72.6	55.9	64.3	102	34	2.99	5.64	0.0	77	56	9.5	SW	76 S	62	5.4	11	9	10	9	0	2	2
Oct.	63.1	46.9	55.0	90	25	2.79	4.92	T	75	55	10.2	SW	55 NW	58	5.4	11	9	11	9	0	*	2
Nov.	51.6	37.1	44.4	83	-2	3.49	5.43	1.5	73	57	11.0	SW	69 SE	49	6.4	9	8	13	10	*	*	1
Dec.	39.7	25.8	32.8	69	-17	3.37	3.36	7.4	71	57	11.3	WNW	63 W	49	6.1	9	9	13	11	2	*	1
Year	58.5	42.8	50.7	104	-18	38.76	8.40	42.5	72	56	10.6	SW	76 S	58	6.1	113	116	136	126	11	19	17

NANTUCKET, MASS. (Memorial Airport) 41°15' N., 70°04' W. Elevation (ground) 43 feet. WB-1958

Month	Air temperature (°F.) Normal: Daily maximum	Daily minimum	Monthly	Extreme: Record highest	Record lowest	Precipitation (inches): Normal total	Maximum in 24 hrs.	Snow, sleet, mean total	Humidity (percent): 7 a.m. EST	1 p.m. EST	Wind (knots): Mean speed	Prevailing direction	Maximum speed and direction	Percent of possible sunshine	Mean sky cover sunrise to sunset	Mean number of days: Sunrise to sunset: Clear	Partly cloudy	Cloudy	Precipitation .01 inch or more	Snow, sleet 1.0 inch or more	Thunderstorms	Heavy fog
(a)				72	72		72	72	71	41	72	72	72	20	72	72	72	72	72	72	72	55
Jan.	39.3	24.8	32.1	64	-4	3.87	2.82	7.0	81	73	12.9	NW	60 NE	42	6.7	7	8	16	13	2	*	5
Feb.	38.0	24.1	31.1	60	-6	3.42	2.77	8.5	80	72	12.9	NW	62 NE	51	6.2	8	7	13	12	2	1	5
Mar.	43.5	29.6	36.6	68	6	4.05	3.22	5.2	80	70	13.1	WNW	79 E	57	5.9	10	8	13	13	1	1	6
Apr.	50.4	36.7	43.6	79	15	3.45	4.48	0.7	79	69	12.7	SW	53 NE	57	5.8	9	9	12	12	*	1	7
May	59.4	45.2	52.3	88	30	2.91	3.07	T	82	71	11.5	SW	45 NE	59	5.8	9	10	12	11	0	2	10
June	67.9	53.8	60.9	90	39	3.24	4.60	0.0	83	73	10.8	SW	59 NE	63	5.7	9	10	11	9	0	3	12
July	73.8	60.3	67.1	92	47	2.83	3.69	0.0	85	74	10.3	SW	54 NE	63	5.6	9	11	11	9	0	3	14
Aug.	74.0	60.2	67.1	95	49	3.43	5.73	0.0	84	72	9.9	SW	63 SE	65	5.4	11	10	10	9	0	3	10
Sep.	68.9	55.1	62.0	88	35	3.37	4.42	0.0	82	71	10.7	SW	69 SW	64	5.4	11	9	10	9	0	2	7
Oct.	60.1	45.9	53.0	82	29	3.60	4.25	T	81	69	11.9	SW	60 E	59	5.6	11	9	11	10	0	1	5
Nov.	51.5	37.4	44.5	69	15	3.72	3.58	0.4	80	71	12.3	WNW	61 NW	48	6.3	7	9	14	12	*	1	3
Dec.	42.3	28.1	35.2	61	-3	3.80	2.62	4.8	80	72	12.4	NW	54 NE	44	6.6	7	8	16	13	1	*	3
Year	55.8	41.8	48.8	95	-6	41.69	5.73	26.6	81	71	11.8	SW	79 E	58	5.9	108	108	149	132	6	18	87

MEAN SURFACE WATER TEMPERATURES AND SALINITIES

Station	Years	Jan.		Feb.		Mar.		Apr.		May		June		July		Aug.		Sept.		Oct.		Nov.		Dec.		Mean	
		Temp. °F	Sal. °/oo	Temp. °F	Sal. °/oo	Temp. °F	Sal. °/oo	Temp. °F	Sal. °/oo	Temp. °F	Sal. °/oo	Temp. °F	Sal. °/oo	Temp. °F	Sal. °/oo	Temp. °F	Sal. °/oo	Temp. °F	Sal. °/oo	Temp. °F	Sal. °/oo	Temp. °F	Sal. °/oo	Temp. °F	Sal. °/oo	Temp. °F	Sal. °/oo
Eastport, Me	29	38.2	32.1	35.2	32.0	35.2	31.9	37.4	31.4	40.7	31.4	44.6	31.6	48.8	32.0	51.7	32.3	52.3	32.5	51.0	32.5	47.8	32.4	42.9	32.1	43.8	32.0
Bar Harbor, Me	12	34.4	31.8	32.7	31.8	35.3	31.5	40.0	31.1	45.7	31.1	51.8	31.2	56.6	31.5	57.6	31.8	55.4	32.0	51.8	32.4	47.1	32.1	39.6	32.0	45.7	31.7
Portland, Me	37	33.0	30.1	32.0	29.9	34.6	29.0	40.1	28.1	47.6	28.4	54.7	29.5	59.3	30.6	60.2	30.6	57.8	30.7	51.8	30.6	44.9	30.2	37.0	29.9	46.1	29.8
Portsmouth, N. H.	15	35.9	28.8	34.6	28.4	36.7	26.0	42.4	24.6	48.8	26.0	55.0	28.2	59.5	30.2	61.3	30.7	58.2	30.6	52.6	31.1	47.2	29.9	40.3	28.9	47.7	28.6
Boston, Mass	37	34.9	28.9	33.9	28.9	37.7	26.7	44.8	26.3	52.8	27.3	60.4	28.8	64.7	29.9	65.8	30.1	63.2	29.8	56.0	30.1	48.1	29.7	39.4	29.3	50.1	28.8

For sea water temperature and salinity data in greater detail, see Coast and Geodetic Survey Publication 31-1, Surface Water Temperatures and Salinities, Atlantic Coast, North and South America.

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HOURS OF OPERATION OF FOG SIGNALS
(U. S. Coast Guard)

Light station	9 Calendar Years - 1950 thru 1958														Pre - 1950		
	Average													Max 1 yr	Ave	For yrs	Max 1 yr
	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Year				
West Quoddy Head, Me. 44°48.9'N., 66°57.1'W.	134	108	99	98	158	144	224	210	141	96	60	93	1565	1761	1427	65	1857
Little River, Me. 44°39.0'N., 67°11.5'W.	72	49	47	74	87	159	232	175	100	58	41	40	1134	1262	1342	44	1703
Libby Island, Me. 44°34.1'N., 67°22.1'W.	135	96	93	92	140	172	217	226	125	94	77	81	1548	1830	1526	65	1954
Moose Peak, Me. 44°28.5'N., 67°32.0'W.	96	80	74	79	107	161	244	209	109	76	56	52	1343	1862	1580	36	1934
Petit Manan, Me. 44°22.1'N., 67°51.9'W.	145	126	129	111	121	157	252	235	125	92	88	97	1678	1970	1493	65	2144
Mount Desert, Me. 43°58.1'N., 68°07.7'W.	58	43	40	53	100	133	195	165	72	59	33	32	983	1292	1401	56	1744
Egg Rock, Me. 44°21.2'N., 68°08.3'W.	67	49	51	68	68	114	161	135	72	52	34	36	907	1085	1206	45	1587
Bass Harbor Head, Me. 44°13.3'N., 68°20.3'W.	60	45	53	54	66	115	159	145	64	50	35	32	878	1169	971	44	1590
Burnt Coat Harbor, Me. 44°08.1'N., 68°26.9'W.	41	39	29	48	79	118	139	145	66	40	28	31	803	1275	1017	38	1782
Matinicus Rock, Me. 43°47.0'N., 68°51.3'W.	105	94	97	101	133	154	203	206	101	81	66	67	1408	1795	1301	65	1700
Owls Head, Me. 44°05.5'N., 69°02.7'W.	54	48	42	56	58	88	122	106	55	46	36	36	747	912	828	44	1177
Eagle Island, Me. 44°13.1'N., 68°46.2'W.	66	66	73	57	66	96	133	132	70	56	41	52	908	1204	794	17	1047
Fort Point, Me. 44°28.0'N., 68°48.7'W.	84	67	63	58	48	65	96	97	74	54	40	53	799	1015	646	44	930
Manana Island Fog Signal, Me. 43°45.8'N., 69°19.7'W.	100	90	91	100	128	164	166	174	84	82	69	66	1314	1445	1122	65	1551
Whitehead, Me. 43°58.7'N., 69°07.5'W.	81	72	74	77	101	122	174	162	86	57	57	46	1109	1380	1317	65	1650
Marshall Point, Me. 43°55.0'N., 69°15.7'W.	91	68	64	73	82	106	125	123	62	57	39	43	933	1275	796	44	1120
The Cuckolds, Me. 43°46.8'N., 69°39.0'W.	86	61	72	75	87	86	114	125	58	60	47	45	916	1248	1240	55	1663
Seguin, Me. 43°42.5'N., 69°45.5'W.	87	70	86	83	95	110	125	129	68	65	60	57	1035	1283	1265	65	1684
Perkins Island, Me. 43°47.2'N., 69°47.1'W.	45	34	40	39	43	59	64	72	32	44	37	30	539	710	537	44	809
Doubling Point, Me. 43°52.9'N., 69°48.0'W.	30	35	35	25	23	29	32	39	23	36	34	25	366	671	379	45	806

HOURS OF OPERATION OF FOG SIGNALS
(U. S. Coast Guard)

Light station	9 Calendar Years - 1950 thru 1958														Pre - 1950		
	Average													Max 1 yr	Ave	For yrs	Max 1 yr
	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Year				
Halfway Rock, Me. 43°39.4'N., 70°02.2'W.	95	65	75	84	78	104	131	134	73	82	84	61	1066	2115	1038	44	1510
Portland Lightship, Me. 43°31.6'N., 70°05.5'W.	110	88	96	86	106	113	126	122	66	73	78	53	1117	1335	1016	41	1513
Cape Elizabeth, Me. 43°34.0'N., 70°12.0'W.	103	80	90	84	103	84	133	131	74	65	60	50	1057	1546	987	65	1514
Portland Head, Me. 43°37.4'N., 70°12.5'W.	89	65	75	61	70	82	93	98	50	45	55	47	830	1006	902	65	1319
Spring Point Ledge, Me. 43°39.1'N., 70°13.5'W.	35	28	29	33	32	49	60	53	26	31	35	17	428	537	470	44	712
Wood Island, Me. 43°27.4'N., 70°19.8'W.	71	55	72	58	68	77	92	90	53	57	51	45	789	1133	762	44	1206
Goat Island, Me. 43°21.5'N., 70°25.5'W.	82	55	61	55	61	64	73	75	32	46	49	46	699	928	638	39	1155
Cape Neddick, Me. 43°09.9'N., 70°35.5'W.	57	38	39	43	51	68	62	68	40	42	32	33	573	938	660	44	768
Whaleback, Me. 43°03.5'N., 70°41.8'W.	56	46	52	50	58	66	75	78	47	53	44	35	660	1055	907	65	1350
Isles of Shoals, N. H. 42°58.0'N., 70°37.4'W.	90	80	84	82	85	90	88	89	69	78	74	68	977	1332	750	43	1314
Annisquam Harbor, Mass. 42°39.7'N., 70°40.9'W.	47	26	29	25	22	20	30	24	12	16	24	16	291	396	160	19	474
Cape Ann, Mass. 42°38.2'N., 70°34.5'W.	76	74	72	62	66	79	63	70	44	57	46	43	752	1044	736	65	1091
Eastern Point, Mass. 42°34.8'N., 70°39.9'W.	54	39	54	41	70	46	56	51	40	38	31	23	543	893	630	51	1155
Bakers Island, Mass. 42°32.2'N., 70°47.2'W.	68	50	60	54	51	48	48	49	32	47	42	32	581	866	602	44	1058
Boston Lightship, Mass. 42°20.4'N., 70°45.5'W.	88	66	72	64	69	62	77	74	44	58	51	43	768	1038	874	52	1231
Boston, Mass. 42°19.7'N., 70°53.4'W.	63	46	50	45	45	41	52	53	33	43	31	25	527	746	691	65	918
Deer Island, Mass. 42°20.4'N., 70°57.3'W.	28	29	28	11	25	19	33	31	20	32	24	12	292	503	385	44	668
Plymouth (Gurnet), Mass. 42°00.2'N., 70°36.1'W.	82	59	57	50	71	59	63	63	53	39	32	32	660	821	563	42	919
Canal Breakwater, Mass. 41°46.8'N., 70°29.4'W.	153	110	141	141	134	135	158	119	92	88	87	89	1447	1802	1135	20	1692
Race Point, Mass. 42°03.7'N., 70°14.6'W.	54	46	39	58	68	55	50	43	31	40	30	25	539	718	697	65	1519

Radio Bearing Conversion Table

Table of corrections, in minutes

[DIFFERENCE OF LONGITUDE IN DEGREES]

Mid. L.	½°	1°	1½°	2°	2½°	3°	3½°	4°	4½°	5°	5½°	6°	6½°	7°	7½°	8°	8½°	9°	9½°	10°
15°	4	8	12	16	19	23	27	31	35	40	43	47	50	54	58	62	66	70	74	78
16°	4	8	12	17	21	25	29	33	37	41	45	50	54	58	62	66	70	74	79	83
17°	4	9	13	18	22	26	31	35	39	44	48	53	57	61	66	70	75	79	83	88
18°	5	9	13	19	23	28	32	37	42	46	51	56	60	65	70	74	79	83	88	93
19°	5	10	15	20	24	29	34	39	44	49	54	59	63	68	73	78	83	88	93	98
20°	5	10	15	21	26	31	36	41	46	51	56	62	67	72	77	82	87	92	98	103
21°	5	11	16	21	27	32	38	43	48	54	59	64	70	75	81	86	91	97	102	108
22°	6	11	17	22	28	34	39	45	51	56	62	67	73	79	84	90	96	101	107	112
23°	6	12	18	23	29	35	41	47	53	59	64	70	76	82	88	94	100	105	111	117
24°	6	12	18	24	31	37	43	49	55	61	67	73	79	85	92	98	104	110	116	122
25°	6	13	19	25	32	38	44	51	57	63	70	76	82	89	95	101	108	114	120	127
26°	7	13	20	26	33	39	46	53	59	66	72	79	85	92	99	105	112	118	125	131
27°	7	14	20	27	34	41	48	54	61	68	75	82	89	95	102	109	116	123	129	136
28°	7	14	21	28	35	42	49	56	63	70	77	84	92	99	106	113	120	127	134	141
29°	7	15	21	29	36	44	51	58	65	73	80	87	95	102	109	116	124	131	138	145
30°	7	15	22	30	38	45	53	60	68	75	83	90	98	105	113	120	127	135	143	150
31°	8	15	23	31	39	46	54	62	70	77	85	93	100	108	116	124	131	139	146	155
32°	8	16	24	32	40	48	56	64	72	79	87	95	103	111	119	127	135	143	151	159
33°	8	16	25	33	41	49	57	65	74	82	90	98	106	114	123	131	139	147	155	163
34°	8	17	25	34	42	50	59	67	75	84	92	101	109	117	126	134	143	151	159	168
35°	9	17	26	34	43	52	60	69	77	86	95	103	112	120	129	138	146	155	163	172
36°	9	18	26	35	44	53	62	71	79	88	97	106	115	123	132	141	150	159	168	176
37°	9	18	27	36	45	54	63	72	81	90	99	108	117	126	135	144	153	163	172	181
38°	9	18	28	37	46	55	65	74	83	92	102	111	120	129	139	148	157	166	175	185
39°	9	19	28	38	47	57	66	75	85	94	104	113	123	132	142	151	160	170	179	189
40°	10	19	29	39	48	58	68	77	87	96	106	116	125	135	145	154	164	174	183	193
41°	10	20	30	39	49	59	69	79	89	98	108	118	128	138	148	157	167	177	187	197
42°	10	20	30	40	50	60	70	80	90	100	110	120	130	140	151	161	171	181	191	201
43°	10	20	31	41	51	61	72	82	92	102	113	123	133	143	153	164	174	184	194	205
44°	10	21	31	42	52	63	73	83	94	104	115	125	135	146	156	167	177	188	198	208
45°	11	21	32	42	53	64	74	85	95	106	117	127	138	149	159	170	180	191	201	212
46°	11	22	32	43	54	65	76	86	97	108	119	129	140	151	162	173	183	194	205	216
47°	11	22	33	44	55	66	77	88	99	110	121	132	143	154	165	176	186	197	208	219
48°	11	22	33	45	56	67	78	89	100	111	123	134	145	156	167	178	190	201	212	223
49°	11	23	34	45	57	68	79	91	102	113	125	136	147	158	170	181	192	204	215	226
50°	11	23	34	46	57	69	80	92	103	115	126	138	149	161	172	184	195	207	218	230
51°	12	23	35	47	58	70	82	93	105	117	128	140	152	163	175	186	198	210	221	233
52°	12	24	35	47	59	71	83	95	106	118	130	142	154	165	177	189	201	213	225	236
53°	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192	204	216	228	240
54°	12	24	36	49	61	73	85	97	109	121	133	146	158	170	182	194	206	218	231	243
55°	12	25	37	49	61	74	86	98	111	123	135	147	160	172	184	197	209	221	233	246
56°	12	25	37	50	62	75	87	100	112	124	137	149	162	174	187	199	211	224	236	249
57°	13	25	38	50	63	75	88	101	113	126	138	151	164	176	189	201	214	226	239	252
58°	13	25	38	51	64	76	89	102	115	127	140	153	165	178	191	204	216	229	242	254
59°	13	26	39	51	64	77	90	103	116	129	141	154	167	180	193	206	219	231	244	257
60°	13	26	39	52	65	78	91	104	117	130	143	156	169	182	195	208	221	234	247	260

Example. A ship in latitude 39°51′. N., longitude 67°35′ W., by dead reckoning, obtains a radio bearing of 299° true on the radiobeacon located in latitude 40°37′. N., longitude 69°37′ W.

Radiobeacon station	Latitude	40°37′ N.
Dead-reckoning position of ship	Latitude	39°51′
Middle latitude		40°14′
Radiobeacon station	Longitude	69°37′ W.
Dead reckoning position of ship	Longitude	67°35′
Longitude difference		2°02′

Entering the table with difference of longitude equals 2°, which is the nearest tabulated value and opposite 40° middle latitude, the correction of 39′ is read.

As the ship is east of the radiobeacon, a minus correction is applied. The Mercator bearing then will be 299°−000°39′=298°21′. To facilitate plotting, subtract 180° and plot from the position of the radiobeacon the bearing 298°21′−180°, or 118°21′ (Mercator bearing reckoned clockwise from true north).

Distance of Visibility of Objects at Sea

The following table gives the approximate geographic range of visibility for an object which may be seen by an observer whose eye is at sea level; in practice, therefore, it is necessary to add to these a distance of visibility corresponding to the height of the observer's eye above sea level.

Height, feet	Nautical miles	Height, feet	Nautical miles	Height, feet	Nautical miles	Height, feet	Nautical miles	Height, feet	Nautical miles
6	2. 8	48	7. 9	220	17. 0	660	29. 4	2, 000	51. 2
8	3. 1	50	8. 1	240	17. 7	680	29. 9	2, 200	53. 8
10	3. 6	55	8. 5	260	18. 5	700	30. 3	2, 400	56. 2
12	4. 0	60	8. 9	280	19. 2	720	30. 7	2, 600	58. 5
14	4. 3	65	9. 2	300	19. 9	740	31. 1	2, 800	60. 6
15	4. 4	70	9. 6	320	20. 5	760	31. 6	3, 000	62. 8
16	4. 6	75	9. 9	340	21. 1	780	32. 0	3, 200	64. 9
18	4. 9	80	10. 3	360	21. 7	800	32. 4	3, 400	66. 9
20	5. 1	85	10. 6	380	22. 3	820	32. 8	3, 600	68. 6
22	5. 4	90	10. 9	400	22. 9	840	33. 2	3, 800	70. 7
24	5. 6	95	11. 2	420	23. 5	860	33. 6	4, 000	72. 5
26	5. 8	100	11. 5	440	24. 1	880	34. 0	4, 200	74. 3
28	6. 1	110	12. 0	460	24. 6	900	34. 4	4, 400	76. 1
30	6. 3	120	12. 6	480	25. 1	920	34. 7	4, 600	77. 7
32	6. 5	130	13. 1	500	25. 6	940	35. 2	4, 800	79. 4
34	6. 7	140	13. 6	520	26. 1	960	35. 5	5, 000	81. 0
36	6. 9	150	14. 1	540	26. 7	980	35. 9	6, 000	88. 8
38	7. 0	160	14. 5	560	27. 1	1, 000	36. 2	7, 000	96. 0
40	7. 2	170	14. 9	580	27. 6	1, 200	39. 6	8, 000	102. 6
42	7. 4	180	15. 4	600	28. 0	1, 400	42. 9	9, 000	108. 7
44	7. 6	190	15. 8	620	28. 6	1, 600	45. 8	10, 000	114. 6
46	7. 8	200	16. 2	640	29. 0	1, 800	48. 6		

Conversion Table, Degrees to Points and Vice Versa

° ′	Points	° ′	Points	° ′	Points	° ′	Points
0 00	N	90 00	E	180 00	S	270 00	W
2 49		92 49		182 49		272 49	
5 38	N ½ E	95 38	E ½ S	185 38	S ½ W	275 38	W ½ N
8 26		98 26		188 26		278 26	
11 15	N x E	101 15	E x S	191 15	S x W	281 15	W x N
14 04		104 04		194 04		284 04	
16 53	N x E ½ E	106 53	ESE ½ E	196 53	S x W ½ W	286 53	WNW ½ W
19 41		109 41		199 41		289 41	
22 30	NNE	112 30	ESE	202 30	SSW	292 30	WNW
25 19		115 19		205 19		295 19	
28 08	NNE ½ E	118 08	SE x E ½ E	208 08	SSW ½ W	298 08	NW x W ½ W
30 56		120 56		210 56		300 56	
33 45	NE x N	123 45	SE x E	213 45	SW x S	303 45	NW x W
36 34		126 34		216 34		306 34	
39 23	NE ½ N	129 23	SE ½ E	219 23	SW ½ S	309 23	NW ½ W
42 11		132 11		222 11		312 11	
45 00	NE	135 00	SE	225 00	SW	315 00	NW
47 49		137 49		227 49		317 49	
50 38	NE ½ E	140 38	SE ½ S	230 38	SW ½ W	320 38	NW ½ N
53 26		143 26		233 26		323 26	
56 15	NE x E	146 15	SE x S	236 15	SW x W	326 15	NW x N
59 04		149 04		239 04		329 04	
61 53	NE x E ½ E	151 53	SSE ½ E	241 53	SW x W ½ W	331 53	NNW ½ W
64 41		154 41		244 41		334 41	
67 30	ENE	157 30	SSE	247 30	WSW	337 30	NNW
70 19		160 19		250 19		340 19	
73 08	ENE ½ E	163 08	S x E ½ E	253 08	WSW ½ W	343 08	N x W ½ W
75 56		165 56		255 56		345 56	
78 45	E x N	168 45	S x E	258 45	W x S	348 45	N x W
81 34		171 34		261 34		351 34	
84 23	E ½ N	174 23	S ½ E	264 23	W ½ S	354 23	N ½ W
87 11		177 11		267 11		357 11	

GULF OF MAINE DISTANCES

CALAIS, ME., TO CAPE COD, MASS.

March 26, 1960

Figure at intersection of columns opposite ports in question is the nautical mileage between the two. Example: Portland, Me., is 100 nautical miles from Boston, Mass.

	Calais, Maine 45°11.4'N., 67°16.7'W.	Eastport, Maine 44°54.3'N., 66°59.0'W.	Lubec, Maine 44°51.7'N., 66°59.0'W.	Machiasport, Maine 44°41.9'N., 67°23.6'W.	Jonesport, Maine 44°31.6'N., 67°37.0'W.	Bar Harbor, Maine 44°23.5'N., 68°12.0'W.	Rockland, Maine 44°06.0'N., 69°05.5'W.	Searsport, Maine 44°27.0'N., 68°54.0'W.	Bucksport, Maine 44°34.3'N., 68°48.0'W.	Bangor, Maine 44°47.7'N., 68°46.3'W.	Boothbay Harbor, Maine 43°51.0'N., 69°37.6'W.	Wiscasset, Maine 43°58.5'N., 69°40.1'W.	Bath, Maine 43°54.5'N., 69°48.7'W.	Augusta, Maine 44°18.9'N., 69°46.4'W.	Portland, Maine 43°39.4'N., 70°14.7'W.	York Harbor, Maine 43°07.9'N., 70°38.6'W.	Portsmouth, N. H. 43°04.6'N., 70°44.5'W.	Newburyport, Mass. 42°48.8'N., 70°52.4'W.	Rockport, Mass. 42°40.0'N., 70°36.5'W.	Gloucester, Mass. 42°36.6'N., 70°39.6'W.	Salem, Mass. 42°31.3'N., 70°52.5'W.	Marblehead, Mass. 42°30.2'N., 70°50.7'W.	Lynn, Mass. 42°27.3'N., 70°56.6'W.	Boston, Mass. 42°22.0'N., 71°03.0'W.	Scituate, Mass. 42°11.9'N., 70°43.5'W.	Plymouth, Mass. 41°57.6'N., 70°39.8'W.	CAPE COD CANAL ENT. 41°46.8'N., 70°29.0'W.	Provincetown, Mass. 42°02.5'N., 70°10.0'W.	NANTUCKET SHOALS 40°30.0'N., 69°25.0'W.
24																													
26	3																												
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Each distance is by shortest route that safe navigation permits between the two ports concerned. Vessels standing along the coast must make their own adjustments for non-direct routes. For example, the table shows a distance of 214 miles by direct route from Machiasport to Provincetown; the distance via Matinicus Rock and Cape Ann is 235 miles. Distances from Eastport to Machiasport and other ports farther southward are via deep Head Harbor Passage, which is 8 miles farther than via shallow Lubec Channel.

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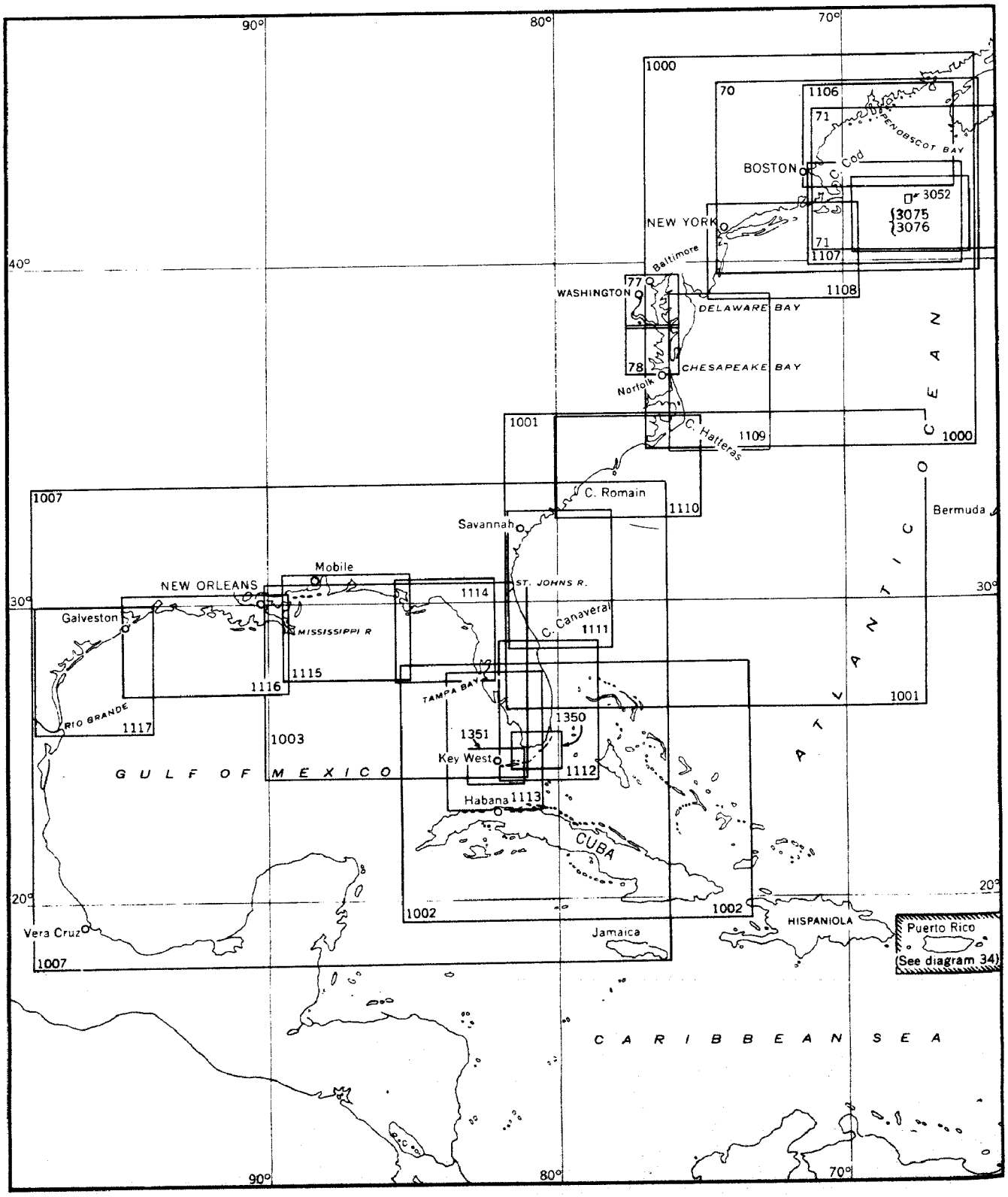
Diagram No. 1

April 1960

SAILING AND GENERAL CHARTS - ATLANTIC AND GULF COASTS



SAILING AND GENERAL CHARTS—ATLANTIC AND GULF COASTS

No.	Price	TITLE	Scale	Paper Size (inches)
		SAILING CHARTS		
70	$1.00	West Quoddy Head to New York	1:675,000	36X46
†1000	1.00	Cape Sable to Cape Hatteras	1:1,200,000	35X43
†1001	1.00	Cape Hatteras to Straits of Florida	1:1,207,256	36X48
†1002	1.00	Straits of Florida and approaches	1:1,210,765	35X43
†1003	1.00	Gulf Coast—Key West to the Mississippi River	1:868,399	36X44
1007	1.00	Gulf of Mexico	1:2,161,530	35X43
		GENERAL CHARTS		
†71	1.00	Gulf of Maine and Georges Bank	1:500,000	36X44
77	.75	Chesapeake Bay—northern part	1:197,250	34X37
78	.75	Chesapeake Bay—southern part	1:200,000	33X34
†1106	1.00	Bay of Fundy to Cape Cod	1:378,838	36X46
†1107	1.00	Georges Bank and Nantucket Shoals	1:400,000	34X48
†1108	1.00	Approaches to New York, Nantucket Shoals to Five Fathom Bank	1:400,000	34X48
†1109	1.00	Cape May to Cape Hatteras	1:416,944	33X52
†1110	1.00	Cape Hatteras to Charleston	1:432,720	34X46
†1111	1.00	Charleston Light to Cape Canaveral	1:449,659	33X45
†1112	1.00	Cape Canaveral to Key West	1:466,940	31X47
1113	1.00	Habana to Tampa Bay	1:470,940	31X45
1114	.75	Tampa Bay to Cape San Blas	1:456,394	30X34
1115	1.00	Cape St. George to Mississippi Passes	1:456,394	35X41
1116	1.00	Mississippi River to Galveston	1:458,596	36X49
1117	1.00	Galveston to Rio Grande	1:460,732	36X44
1350	.75	Florida Keys—Fowey Rocks to American Shoal	1:180,000	35X39
1351	.75	Florida Keys—Sombrero Key to Dry Tortugas	1:180,000	30X48
		SPECIAL CHARTS		
3052	.75	Georges Bank—Georges Shoal, approaches to Texas Tower No. 2	1:20,000	26X42
{3075	1.00	Georges Bank—eastern part	1:220,000	36X46
{3076		Georges Bank—western part	1:220,000	

†Includes Loran Lines of Position

Numbers in brackets represent charts printed back to back.

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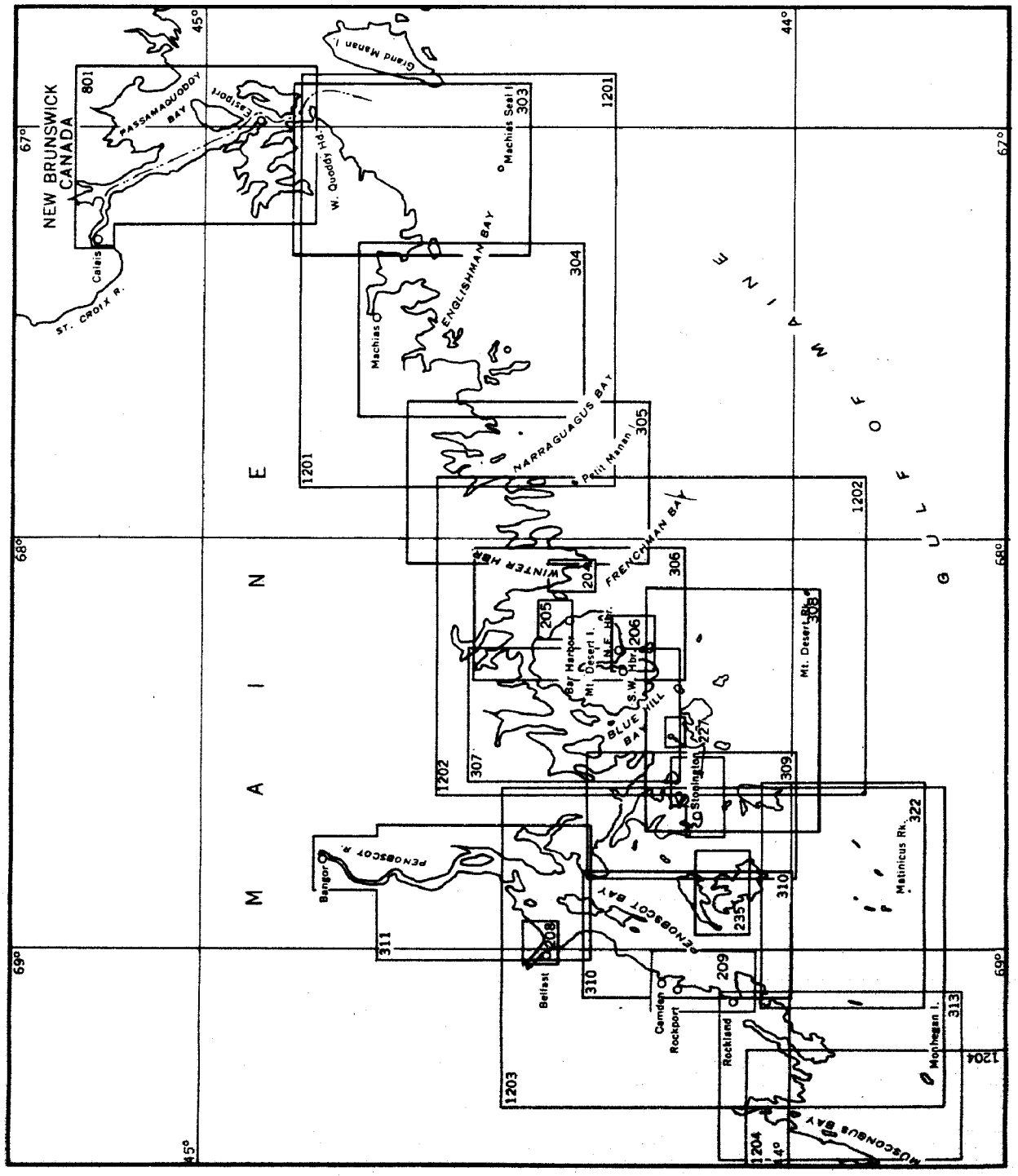
Diagram No. 2
August 1959

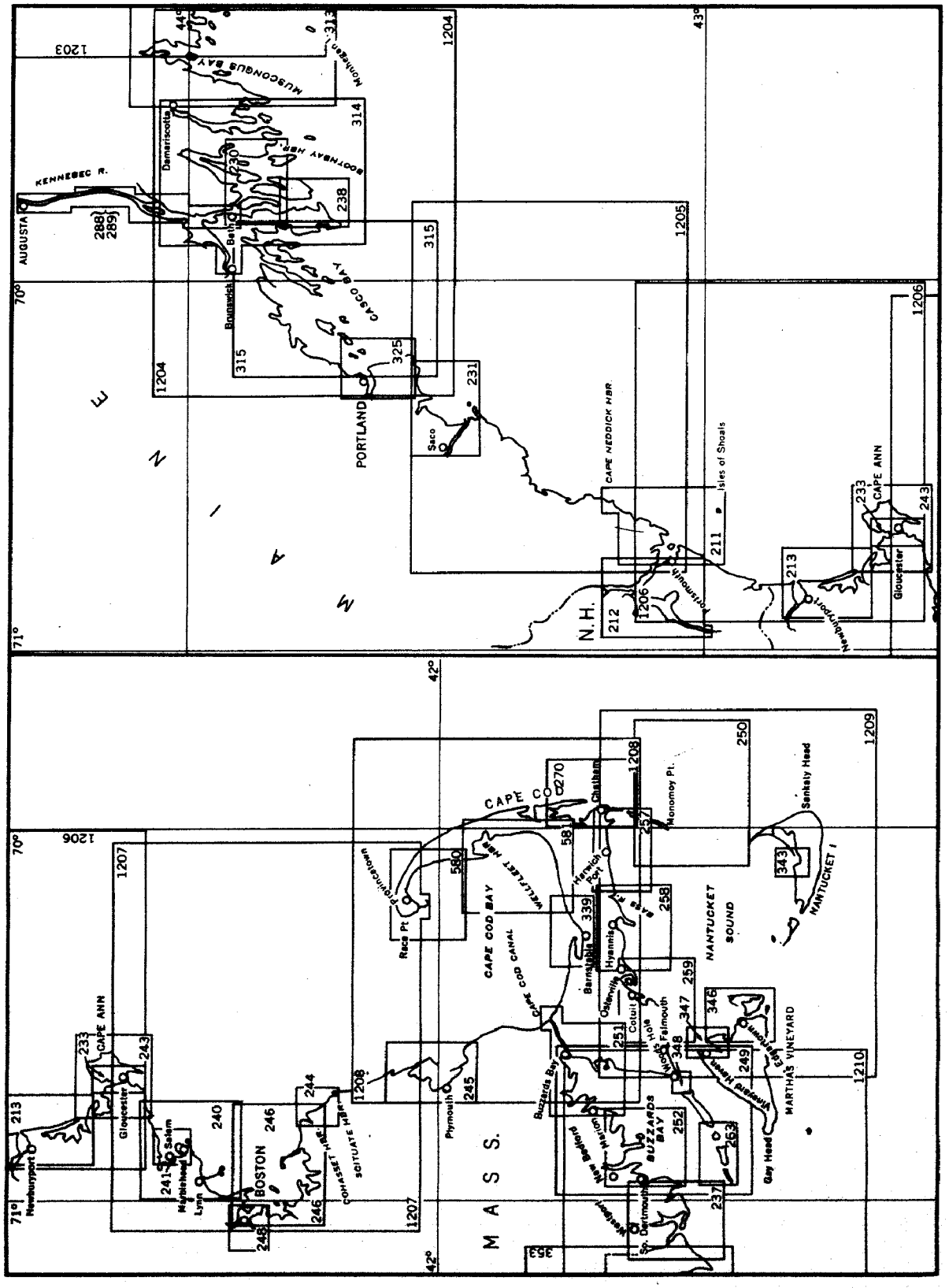


COAST AND HARBOR CHARTS - ATLANTIC COAST
PASSAMAQUODDY BAY TO MONHEGAN I., MAINE

COAST AND HARBOR CHARTS—ATLANTIC COAST
PASSAMAQUODDY BAY TO MONHEGAN I., MAINE

No.	Price	TITLE	State	Scale	Paper size (inches)
		COAST CHARTS			
1201	$1.00	Quoddy Roads to Petit Manan Island	Maine	1:80,000	33X42
1202	1.00	Frenchman and Blue Hill Bays and approaches	"	1:80,000	34X44
1203	1.00	Penobscot Bay and approaches	"	1:80,000	33X44
		HARBOR CHARTS			
204	.50	Winter Harbor	Maine	1:10,000	24X30
205	.50	Bar Harbor	"	1:10,000	26X30
206	1.00	Southwest Harbor and approaches	"	1:10,000	36X47
208	.50	Belfast Harbor	"	1:10,000	22X29
209	.75	Camden, Rockport and Rockland Harbors	"	1:20,000	27X41
227	.50	Deer Island Thorofare and Casco Passage	"	1:20,000	22X35
235	.50	Fox Islands Thorofare	"	1:20,000	23X34
303	1.00	West Quoddy Head to Cross Island	"	1:40,000	36X47
304	1.00	Machias Bay to Tibbett Narrows	"	1:40,000	36X45
305	1.00	Tibbett Narrows to Schoodic Island	"	1:40,000	34X48
306	.75	Frenchman Bay and eastern part of Mt. Desert Island	"	1:40,000	28X42
307	.75	Blue Hill Bay and western part of Mt. Desert Island	"	1:40,000	28X42
308	1.00	Approaches to Blue Hill Bay	"	1:40,000	36X50
309	.75	East Penobscot Bay	"	1:40,000	27X42
310	.75	West Penobscot Bay	"	1:40,000	27X42
311	.75	Penobscot River	"	1:40,000	28X43
313	1.00	Muscongus Bay	"	1:40,000	35X45
322	1.00	Approaches to Penobscot Bay	"	1:40,000	36X45
801	1.00	Calais to West Quoddy Head	"	1:40,000	32X48

Diagram No. 3
Mar. 1960



COAST AND HARBOR CHARTS—ATLANTIC COAST

MONHEGAN I., MAINE TO BUZZARDS BAY, MASS.

No.	Price	TITLE	State	Scale	Paper size (inches)
		COAST CHARTS			
1204	$1.00	Monhegan Island to Cape Elizabeth	Maine	1:80,000	35X45
1205	1.00	Cape Elizabeth to Portsmouth	Maine & N.H.	1:80,000	34X43
		Cape Porpoise Harbor	Maine	1:10,000	
1206	1.00	Portsmouth to Cape Ann	N.H. & Mass.	1:80,000	34X40
		Hampton Harbor	New Hampshire	1:30,000	
†1207	1.00	Massachusetts Bay	Massachusetts	1:80,000	36X45
1208	1.00	Cape Cod Bay	"	1:80,000	35X43
1209	1.00	Nantucket Sound and approaches	"	1:80,000	35X43
1210	1.00	Martha's Vineyard to Block Island, including Buzzards and Narragansett Bays	Mass. & R.I.	1:80,000	36X43
		HARBOR CHARTS			
211	1.00	Portsmouth Harbor, Cape Neddick Harbor to Isles of Shoals	Maine & N.H.	1:20,000	34X48
212	1.00	Portsmouth to Dover and Exeter	"	1:20,000	34X48
213	.75	Newburyport Harbor and Plum Island Sound	Massachusetts	1:20,000	33X39
230	1.00	Boothbay Harbor to Bath, including Kennebec River	Maine	1:15,000	35X46
231	.75	Saco Bay and vicinity	"	1:20,000	31X42
233	.75	Gloucester Harbor and Annisquam River	Massachusetts	1:10,000	25X45
237	1.00	Westport River and Approaches	"	1:20,000	36X46
238	1.00	Kennebec River Entrance	Maine	1:15,000	31X47
240	.75	Salem and Lynn Harbors	Massachusetts	1:25,000	36X39
241	.75	Salem, Marblehead and Beverly Harbors	"	1:10,000	33X33
243	1.00	Ipswich Bay to Gloucester Harbor	"	1:20,000	36X40
		Rockport Harbor		1:5,000	
244	.75	Cohasset and Scituate Harbors	"	1:10,000	35X42
245	.75	Harbors of Plymouth, Kingston, and Duxbury	"	1:20,000	29X41
246	1.00	Boston Harbor	"	1:25,000	36X46
248	1.00	Boston Inner Harbor	"	1:10,000	35X44
249	1.00	Buzzards Bay	"	1:40,000	36X46
250	.50	Eastern entrance to Nantucket Sound	"	1:40,000	31X34
251	1.00	Cape Cod Canal and approaches	"	1:20,000	36X44
252	.75	New Bedford Harbor and approaches	"	1:20,000	36X38
257	.75	Nantucket Sound—Chatham Roads	"	1:20,000	29X39
258	.75	Hyannis Harbor and vicinity	"	1:20,000	35X39
259	1.00	Nantucket Sound—Osterville to Green Pond	"	1:20,000	36X40
263	1.00	Robinsons Hole to Cuttyhunk Harbor	"	1:12,000	31X46
270	1.00	Chatham Harbor and Pleasant Bay	"	1:20,000	33X44
{288	.75	Kennebec River—Bath to Courthouse Point	Maine	1:15,000	29X37
{289		Kennebec River—Courthouse Point to Augusta	"	1:15,000	
313	1.00	Muscongus Bay	"	1:40,000	35X45
314	1.00	Damariscotta, Sheepscot and Kennebec Rivers	"	1:40,000	35X47
315	1.00	Casco Bay	"	1:40,000	36X46
325	.75	Portland Harbor	"	1:20,000	30X34
339	.50	Barnstable Harbor	Massachusetts	1:20,000	24X34
343	.50	Nantucket Harbor	"	1:10,000	27X32
346	.50	Edgartown Harbor, Martha's Vineyard	"	1:20,000	27X34
347	.75	Vineyard Haven, Martha's Vineyard	"	1:10,000	29X39
348	.75	Woods Hole	"	1:5,000	30X45
580	1.00	Provincetown Harbor	"	1:20,000	35X44
581	.25	Wellfleet Harbor	"	1:40,000	23X29

Numbers in brackets represent charts printed back to back.

† Includes Loran Lines of Position.

Conversion Tables

INTERNATIONAL NAUTICAL MILES TO STATUTE MILES

1 nautical mile 6,076.10 feet or 1,852 meters 1 statute mile = 5,280 feet or 1,609.35 meters

Nautical miles	0	1	2	3	4	5	6	7	8	9
0	0.000	1.151	2.302	3.452	4.603	5.754	6.905	8.055	9.206	10.357
10	11.508	12.659	13.809	14.960	16.111	17.262	18.412	19.563	20.714	21.865
20	23.016	24.166	25.317	26.468	27.619	28.769	29.920	31.071	32.222	33.373
30	34.523	35.674	36.825	37.976	39.126	40.277	41.428	42.579	43.730	44.880
40	46.031	47.182	48.333	49.483	50.634	51.785	52.936	54.087	55.237	56.388
50	57.539	58.690	59.840	60.991	62.142	63.293	64.444	65.594	66.745	67.896
60	69.047	70.197	71.348	72.499	73.650	74.801	75.951	77.102	78.253	79.404
70	80.554	81.705	82.856	84.007	85.158	86.308	87.459	88.610	89.761	90.911
80	92.062	93.213	94.364	95.515	96.665	97.816	98.967	100.118	101.268	102.419
90	103.570	104.721	105.871	107.022	108.173	109.324	110.475	111.625	112.776	113.927

STATUTE MILES TO INTERNATIONAL NAUTICAL MILES

Statute miles	0	1	2	3	4	5	6	7	8	9
0	0.000	0.869	1.738	2.607	3.476	4.345	5.214	6.083	6.952	7.821
10	8.690	9.559	10.428	11.297	12.166	13.035	13.904	14.773	15.642	16.511
20	17.380	18.249	19.118	19.986	20.855	21.724	22.593	23.462	24.331	25.200
30	26.069	26.938	27.807	28.676	29.545	30.414	31.283	32.152	33.021	33.890
40	34.759	35.628	36.497	37.366	38.235	39.104	39.973	40.842	41.711	42.580
50	43.449	44.318	45.187	46.056	46.925	47.794	48.663	49.532	50.401	51.270
60	52.139	53.008	53.877	54.746	55.615	56.484	57.353	58.222	59.091	59.959
70	60.828	61.697	62.566	63.435	64.304	65.173	66.042	66.911	67.780	68.649
80	69.518	70.387	71.256	72.125	72.994	73.863	74.732	75.601	76.470	77.339
90	78.208	79.077	79.946	80.815	81.684	82.553	83.422	84.291	85.160	86.029

FEET TO METERS

Feet	0	1	2	3	4	5	6	7	8	9
0	0.00	0.30	0.61	0.91	1.22	1.52	1.83	2.13	2.44	2.74
10	3.05	3.35	3.66	3.96	4.27	4.57	4.88	5.18	5.49	5.79
20	6.10	6.40	6.71	7.01	7.32	7.62	7.92	8.23	8.53	8.84
30	9.14	9.45	9.75	10.06	10.36	10.67	10.97	11.28	11.58	11.89
40	12.19	12.50	12.80	13.11	13.41	13.72	14.02	14.33	14.63	14.93
50	15.24	15.54	15.85	16.15	16.46	16.76	17.07	17.37	17.68	17.98
60	18.29	18.59	18.90	19.20	19.51	19.81	20.12	20.42	20.73	21.03
70	21.34	21.64	21.95	22.25	22.55	22.86	23.16	23.47	23.77	24.08
80	24.38	24.69	24.99	25.30	25.60	25.91	26.21	26.52	26.82	27.13
90	27.43	27.74	28.04	28.35	28.65	28.96	29.26	29.57	29.87	30.17

METERS TO FEET

Meters	0	1	2	3	4	5	6	7	8	9
0	0.00	3.28	6.56	9.84	13.12	16.40	19.68	22.97	26.25	29.53
10	32.81	36.09	39.37	42.65	45.93	49.21	52.49	55.77	59.06	62.34
20	65.62	68.90	72.18	75.46	78.74	82.02	85.30	88.58	91.86	95.14
30	98.42	101.71	104.99	108.27	111.55	114.83	118.11	121.39	124.67	127.95
40	131.23	134.51	137.80	141.08	144.36	147.64	150.92	154.20	157.48	160.76
50	164.04	167.32	170.60	173.88	177.16	180.45	183.73	187.01	190.29	193.57
60	196.85	200.13	203.41	206.69	209.97	213.25	216.54	219.82	223.10	226.38
70	229.66	232.94	236.22	239.50	242.78	246.06	249.34	252.62	255.90	259.19
80	262.47	265.75	269.03	272.31	275.59	278.87	282.15	285.43	288.71	291.99
90	295.28	298.56	301.84	305.12	308.40	311.68	314.96	318.24	321.52	324.80

U. S. GOVERNMENT PRINTING OFFICE : 1960 O - 544938