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UNITED STATES COAST PILOT 8

PACIFIC COAST, ALASKA

Dixon Entrance to Cape Spencer

Eleventh (January 6, 1962) Edition

Corrected through NM-1/62

United States Government Printing Office, Washington: 1962

For sale by the Coast and Geodetic Survey and its sales agents: $2.50

National Oceanic and Atmospheric Administration

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Preface

United States Coast Pilot 8, Pacific Coast, Alaska—Dixon Entrance to Cape Spencer, Eleventh (January 6, 1962) Edition, is based on the work of the Coast and Geodetic Survey. Special material also has been obtained from the Weather Bureau, the Coast Guard, and the Corps of Engineers. The edition is corrected through Notice to Mariners 1 of 1962.

The first edition of "Coast Pilot of Alaska, Southern Boundary to Cook's Inlet" was written by Assistant George Davidson, Coast Survey, and published in 1869. The present (eleventh) edition, which stops at Cape Spencer, was prepared by Navigation Specialist John A. O'Pray, USC&GS, under the direction of John A. McCormick, Chief, Coast Pilot Branch.

United States Coast Pilot 8 is sold only by the Coast and Geodetic Survey and its sales agents; the price is $2.50. Cumulative Supplements, containing revisions and new information reported since date of edition, usually are issued early each year and are distributed free.

The Survey welcomes criticism of its Coast Pilots; write to Director, Coast and Geodetic Survey, U.S. Department of Commerce, Washington 25, D.C.

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1. GENERAL INFORMATION

EXPLANATORY.—Coast Pilot Supplements should be kept intact; the numbered-line continuity with the editions was designed to eliminate cutting and pasting.

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 by the Nautical Chart Division, C&GS. They may be as-built, authorized, or reported; see latest prints of nautical charts for possible modifier. Also see charts for horizontal clearances of bridges; these are repeated in the Coast Pilots only when they are less than 50 feet and then only in terms of channel width or length of span.

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.—Stated current velocities are the averages at strength. Velocities are in knots, which are nautical miles per hour. Directions are the true directions to which the currents set.

Depth units.—Depths are in feet or fathoms 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. See Coast Guard Light Lists for complete information.

Radio navigational aids and radio weather aids.—These are not fully described. See Coast Guard Light Lists and H.O. Publications 117 and 118.

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 required to provide charts and related information for the safe navigation of marine and air commerce, and to provide basic data for engineering and scientific purposes and for other commercial and industrial needs.

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 Jersey 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.

Small-craft charts are another special series, started in 1959, covering areas of most interest to the amateur navigator. This unique series combines the graphics of the standard nautical charts with the verbal information of the Coast Pilots.

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, suitable 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 burn 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, landlocked 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 Marine 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 char-

acteristics, 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, 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 in H.O. Publication No. 117, Radio Navigational Aids, 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 the 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. 117, 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.

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 purpose 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. 117, 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 subtracted 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. 117, 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 international 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 (means 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. Repetitions 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 by the Corps of Engineers and the Maritime Administration and sold by the Superintendent of Documents, Washington, D.C., 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, except Alaska, but including the Great Lakes and Puerto Rico, when winds dangerous to navigation are forecast.

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; see Appendix for coverage.

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 non-resident 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 quarantine 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 conditions 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

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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 117, 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 determine 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 118, 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.

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

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 sugnals 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 become 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 Alaska.

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.

§ 82.275 Bays, sounds, straits, and inlets on the coast of southeastern Alaska between Cape Spencer Light Station and Sitklan Island. A line drawn from Cape Spencer Light Station due south to a point of intersection which is due west of the southernmost extremity of Cape Cross; thence to Cape Edgecumbe Lighthouse; thence through Cape Bartolome Lighthouse and extended to a point of intersection which is due west of Cape Muzon Lighthouse; thence due east to Cape Muzon Lighthouse; thence to a point which is one mile, 180° true from Cape Chacon Lighthouse; thence to Barren Island Lighthouse; thence to Lord Rock Lighthouse; thence to the southernmost extremity of Garnet Point, Kanagunut Island; thence to the southeasternmost extremity of Island Point, Sitklan Island. A line drawn from the northeasternmost extremity of Point Mansfield, Sitklan Island, 040° true, to where it intersects the mainland.

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 registered vessel of the United States, and every foreign vessel arriving at a United States port or place from a port or place outside the United States, or any such vessel destined from one port or place in the United States to another port or place in the United States, shall give at least 24 hours advance notice of arrival to the Captain of the Port at every port or place where the vessel is to arrive, except as follows:

(1) Registered United States pleasure vessels and registered United States fishing vessels are not required to submit advance notice of arrival report.

(2) When 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 port or place is located.

(3) When the arrival is a direct result of the operation of "force majeure," and it is not possible to give at least 24 hours' advance notice of time of arrival, then advance notice as early as practicable shall be furnished.

(4) When the vessel, while in United States waters, does not navigate any portion of the high seas, i.e., does not navigate beyond the low water mark along the coasts or beyond the waters contained within the headlands of the United States.

(5) When a vessel is engaged upon a scheduled route 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.

(6) When the master of a merchant vessel (except on a coastwise voyage of 24 hours or less) reports in accordance with the U.S. Coast Guard's voluntary Atlantic Merchant Vessel Report (AMVER) System, he shall be considered to be in constructive compliance with the requirements of paragraph (a) of this section and no additional advance notice of vessel's arrival reports to the Captain of the Port is 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 to the Captain of the Port at next port of call prior to or upon departure from port.

(7) When 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.

(8) (a) A westbound vessel which is to proceed to or through United States waters of the St. Lawrence River and/or the Great Lakes under conditions other than provided for in subparagraphs (3), (5), and (7) of this paragraph, shall be subject to compliance with paragraph (b) of this section.

(b) The master or agent of every vessel other than vessels of United States or Canadian nationality engaged in the coastal trade of their respective countries or in trade between their two countries without calling at any other country en route, when proceeding westbound to United States waters of the St. Lawrence River and/or the Great Lakes shall:

(1) At least 24 hours in advance of the vessel's arrival at the Snell Lock, Massena, New York, advise the Commander, Ninth Coast Guard District, Cleveland, Ohio, of estimated time of arrival of such vessel at the Snell Lock.

(2) In addition, prior to or immediately on entering Lake Ontario inbound, advise the Commander, Ninth Coast Guard District, of the vessel's first intended United States port of call, if any, and estimated time of arrival at that port.

(3) Upon the vessel's arrival in the first United States port, cause to be delivered to the Captain of the Port (or the Commander, Ninth Coast Guard District where no Captains of the Port are assigned) an itinerary giving the intended ports of call on the Great Lakes and the estimated dates of arrival.

(4) A master of a vessel who reports in accordance with the U.S. Coast Guard's voluntary Atlantic Merchant Vessel Report (AMVER) System and who includes in this report an estimated time of arrival at the Snell Lock, Massena, New York, shall be considered to be in constructive compliance with the requirements of subparagraph (1) of this paragraph and no additional advance notice of vessel's arrival at the Snell Lock is required. Likewise a master of such vessel who indicates in this report the name of the first intended United States port of call and estimated time of arrival at that port shall be considered in constructive compliance with subparagraph (2) of this paragraph and no additional advance notice of arrival is required.

§ 124.20 Penalties for violations. 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.

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 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:

§ 202.129 Favorite Channel between Point Stephens and Point Louisa, Alaska. (a) North Area. The waters of Lena Cove south and east of a line beginning at a point on shore at latitude 58°24′35″, longitude 134°45′52″; thence south 21°15′ west, 800 feet to a small unnamed island; and thence south 11°30′ east, aproximately 3,560 feet to Lena Point at latitude 58°23′48″, longitude 134°45′42″, except the waters fronting the Lena Cove Recreation Area from the mean low water line channelward 300 feet.

(b) South Area. The waters south of Lena Point and north of a line beginning at a point on shore at latitude 58°23′04″, longitude 134°45′32″; thence south 33°15′ east, 1,300 feet to an unlighted buoy at latitude 58°22′56″, longitude 134°45′24″; thence south 57°30′ east, 6,900 feet to an unlighted buoy at latitude 58°22′18″, longitude 134°43′36″; and thence due north 900 feet to the shore at Point Louisa.

NOTE. The areas are reserved for recreational and other small craft. Temporary floats and buoys will be allowed in the areas. Anchors must not be placed outside the areas, nor shall any vessel be so anchored that any portion of the hull or rigging will, at any time, extend into the cable areas to the west of the anchorage areas.

Subpart B—Anchorage Grounds.

None.

PART 207—NAVIGATION REGULATIONS:

§ 207.785 Tongass Narrows, Alaska; navigation—(a) Definitions. The term "Tongass Narrows" includes the body of water shown on United States Coast and Geodetic Survey Chart No. 8094 lying between Revillagigedo Channel and Guard Islands in Clarence Strait.

(b) No vessel shall exceed a speed of seven knots between Idaho Rock and Charcoal Point.

(c) No vessel shall while moored or at anchor, or by slow passage or otherwise while underway, unreasonably obstruct the free passage and progress of other vessels.

(d) No vessel shall moor or anchor to any structure of the United States other than mooring piers, wharves, and floats without the consent of the District Engineer, Alaska District, Anchorage, Alaska, or his authorized representative.

§ 207.790 Port Alexander, Alaska; speed of vessels—(a) Definition. The Term "Port Alexander" includes the body of water so indicated on United States Coast and Geodetic Survey Chart No. 8261 from its head to its entrance from Chatham Strait.

(b) Speed. The speed of all vessels of 5 tons or more gross, ships register, shall not exceed 3 miles per hour either in entering, leaving, or navigating within Port Alexander, Alaska.

§ 207.800 Wrangell Narrows, Alaska; use, administration, and navigation—(a) Definitions. (1) The term "Wrangell Narrows" includes the entire body of water shown on United States Coast and Geodetic Survey Chart No. 8170 between Wrangell Narrows North Entrance Lighted Bell Buoy 63 and Midway Rock Light.

(2) The term "raft section" refers to a standard raft of logs or piling securely fastened together for long towing in Alaska inland waters in the manner customary with the local logging interests, i.e., with booms, swifters, and tail sticks. It normally contains 30,000 to 70,000 feet board measure of logs or piling and has a width of 45 to 60 feet and a length of 75 to 100 feet.

(3) The term "horsepower" refers to the manufacturer's rating of the towboat engine as shown in standard catalogs or on the name plate fixed to the engine.

(b) Fish traps. No fish traps shall be towed through Wrangell Narrows without specific authority, in each case, from the District Engineer, Alaska District, Corps of Engineers, Anchorage, Alaska.

(c) Speed restrictions. No vessel shall exceed a speed of seven (7) knots between Wrangell Narrows Channel Light 52 and an unmarked point in the channel one (1) nautical mile to the southward and between Wrangell Narrows Channel Light 58 and Wrangell Narrows Lighted Buoy 60.

(d) Tow Channel. (1) The following route shall be taken by all tows passing through Wrangell Narrows when the towboat has a draft of nine feet or less (northbound, read down; southbound, read up):

East of Battery Islets:
East of Tow Channel Buoy 1 TC.
East of Tow Channel Buoy 3 TC.
West of Tow Channel Buoy 4 TC.
East of Colorado Reef:
East of Wrangell Narrows Channel Light 21.
West of Wrangell Narrows Channel Lighted Buoy 23.
East of Tow Channel Buoy 5 TC.
East of Tow Channel Buoy 7 TC.
West of Petersburg:
East of Wrangell Narrows Channel Light 54 FR.
East of Wrangell Narrows Channel Light 56 Qk FR.
East of Wrangell Narrows Channel Light 58 FR., thence proceeding to west side of channel and leaving Wrangell Narrows by making passage between Wrangell Narrows Channel Daybeacon 61 and Wrangell Narrows North Entrance Lighted Bell Buoy 63 F.

(2) For towboats drawing more than nine feet, application shall be made to the District Engineer, Alaska District, Corps of Engineers, Anchorage, Alaska, for authority to use the ship channel for each trip.

(e) Size of tows. The maximum tows permitted shall be as follows:

(1) Towboats of 25 horsepower or less. Not permitted to take any tows through Wrangell Narrows other than fuel logs, not to exceed 500 feet board measure per horsepower up to a maximum of 10,000 feet board measure.

(2) Towboats of 26 to 49 horsepower. Fuel logs not to exceed 10,000 feet board measure, or one freighting scow not larger than 30 feet by 60 feet, or one raft section.

(3) Towboats of 50 to 89 horsepower. Fuel logs, not to exceed 10,000 feet board measure if in "tandem" (not bound together) or 15,000 feet board measure if chained or cabled, or one anchor lifter, or one pile driver, or two units of other towable equipment, or two raft sections.

(4) Towboats of 90 horsepower or over. Fuel logs not to exceed 10,000 feet board measure if in "tandem" (not bound together) or 15,000 feet board measure if chained or cabled, or one anchor lifter, or one pile driver, or three units of other towable equipment, or seven raft sections.

(f) Arrangement of tows. (1) No towline or aggregate of towlines between towboat and separated pieces shall exceed 150 feet in length.

(2) Tows shall not exceed 65 feet in width overall.

(3) Tows other than rafts shall be taken alongside the towboat whenever possible.

(g) Anchorage. No craft or tow shall be anchored in Wrangell Narrows in either the main ship channel or the towing channel, nor shall any craft or tow be anchored so that it can swing into either of these channels.

(h) Disabled craft. Disabled craft in a condition of absolute necessity are exempt from the regulations in this section.

§ 207.801 Lutak Inlet, Alaska; restricted area—(a) The area. (1) The waters of Lutak Inlet bounded as follows: Beginning at the water's edge 900 feet northwest of the centerline of the landward end of the POL dock; thence

800 feet, 51° true; thence 1,400 feet, 113° true, thence 450 feet, 211° true to the water's edge at a point approximately 720 feet from the most southwest corner of the seaward end of the POL dock; thence along the water's edge to the point of beginning.

(2) The area will be marked at points approximately 200 feet apart along the shore by white signs containing the word "Warning". The signs will not be lighted.

(b) The regulations. (1) No vessels or other craft shall enter or remain in the area when tankers are engaged in discharging oil at the POL dock.

(2) The regulations in this section shall be enforced by the District Engineer, Corps of Engineers, Anchorage, Alaska, and such agencies as he may designate.

§ 207.804 Bering Strait, Alaska; naval restricted area off Cape Prince of Wales—(a) The area. An area 2,000 feet wide extending from a point on Cape Prince of Wales marked by a triangular cable marker located approximately midway between the village of Wales and Cape Prince of Wales Light to a point four statute miles due west of the cable marker with the axis of the area passing through the two points.

(b) The regulations. (1) No vessel shall anchor in the restricted area described in paragraph (a) of this section.

(2) Dragging of anchors in or across the restricted area is prohibited and no object attached to a vessel shall be placed on or near the bottom.

(3) The regulations in this section shall be enforced by the Commandant, Seventeenth Naval District, Seattle, Washington, and such agencies as he may designate.

3. ALASKA—DIXON ENTRANCE TO CAPE SPENCER

ALASKA, the largest of the United States, occupies the northwestern part of the North American continent. The State is bordered on the east and south by Canada and on the west and north by the Pacific and Arctic Oceans. The northernmost point of Alaska is Point Barrow (71°23′ N., 156°28′ W.); the westernmost point is Cape Wrangell (52°55′ N., 172°26′ E.) on Attu Island; and the southernmost point is Cape Muzon (54°40′ N., 132°41′ W.) on the historic parallel which is the coastal boundary between Alaska and Canada's British Columbia. Cape Muzon is on the north side of Dixon Entrance and is 480 miles northwestward of Cape Flattery, Washington; between the two United States capes is the coastal area of British Columbia.

Alaska was purchased from Russia in 1867 and became an organized territory of the United States in 1912. By Presidential proclamation of January 3, 1959, Alaska officially became the 49th of the United States. The population of the State was 226,157 in 1960. Principal resources are fisheries, minerals, timber, and furs. Alaska has a general ocean coastline of 5,770 nautical miles and a tidal shoreline of 29,462 miles. The State is so huge that its description requires two complete volumes of the Coast and Geodetic Survey's eight-volume series of United States Coast Pilots.

Coast Pilot 8 deals with the panhandle section of Alaska between the southern boundary and Cape Spencer; general ocean coastline is only 250 nautical miles but tidal shoreline totals 11,085 miles.

Subject area consists of a 30-mile-wide strip of mainland bordered by an 80-mile-wide compact chain of islands. Most of the islands are mountainous, rough, and broken, and are covered with dense growths of spruce, hemlock, and cedar except on the higher summits. The mountains on the mainland are higher, less wooded, and usually snowcapped.

In midsummer the snowline is at altitudes of 2,000 to 3,000 feet on the mainland mountains. Glaciers form in the narrow gorges of the coastal ranges and sometimes attain sufficient size to reach the water. On the islands the land usually does not reach enough altitude to retain snow throughout the year.

Seabottom features are similar to those of the adjacent land. The steep inclines and narrow gorges of the land continue below sea level and form a system of narrow deep-water straits that extends from Puget Sound to Cape Spencer. The rugged ridges and peaks of the land area, and the absence of plains or extensive plateaus, are matched by the numerous rocks and reefs, surrounded by deep water, and the general absence of extensive shoals except at the mouths of glacier-fed streams or rivers.

Harbors and ports.—The principal cities or towns in this part of Alaska are Craig, Douglas, Haines, Juneau (the State capital), Ketchikan, Pelican, Petersburg, Sitka, Skagway, and Wrangell.

Boundary lines of inland waters.—At all buoyed entrances from seaward to bays, sounds, rivers, or other estuaries of the United States 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; see **Part 82, Chapter 2,** for specific lines. **International Pilot Rules** apply outside United States aids and in all Canadian waters.

Control over movement of vessels.—See **Part 124, Chapter 2,** for regulations requiring advance notice of vessel's time of arrival to Captain of the Port.

Channels.—Deep passages lead to most of the southeastern ports. Some of these ports have small-boat basins with access channels that require dredging.

Anchorages.—Many places in the inside passages are suitable for temporary anchorage during the summer. In fall and winter, the navigator must be much more selective as regards shelter and good holding ground.

Dangers.—Southeastern Alaska has many unmarked rocky ledges around its islands and in the approaches to inlets, straits, or sounds. **Kelp** grows on nearly every rocky bottom and should always be considered a sign of danger. Dead, detached kelp floats on the water in masses, while live kelp attached to rocks streams away level with the surface. **Live kelp is nearly always an indication of depths less than 10 fathoms.**

Fishtraps are numerous along the Alaska coast and in some of the inside passages. The piles often break off and become dangers to navigation. Strangers should proceed with caution when crossing present or past fishtrap areas. Corps of Engineers regulations limit the areas within which fishtraps may be established; the regulations also require that the traps be lighted from sunset to sunrise.

Aids to navigation.—Lights, daybeacons, and buoys mark the coast and inside passages of southeastern Alaska. The principal light stations are equipped with radiobeacons and fog signals and are manned by resident personnel; see Coast Guard Light List for details.

Echoes.—In foggy weather, the distance offshore frequently can be estimated by noting the elapsed time between a sounding of a ship's whistle or siren and the resultant echo from the sides of hills or mountains. The distance in nautical miles from hill or mountain is about one-tenth the number of seconds between sound and echo. In narrow channels with steep shores a vessel can be kept in midchannel by navigating so that echoes from both shores return at the same instant.

Tides.—Throughout southeastern Alaska there are considerable inequalities in the heights of the two high waters and the two low waters of each day; these differences average about 2 feet between successive high waters and

3 feet between successive low waters. Because of such differences, the mean of the lower low waters (rather than the mean of all low waters) has been adopted as the plane of reference for C&GS nautical charts of the area.

The average daily (diurnal) range of tide is 10 to 17 feet in this part of Alaska; the greater ranges occur in the inside passages. The C&GS Tide Tables contain daily predictions for Juneau, Ketchikan, and Sitka; the tables also include tidal differences and constants for many other places in the area.

Currents.—The prevailing current that sets northwestward along the coasts of British Columbia and southeastern Alaska may reach velocities (estimated) of 1.5 knots; it is greatest with strong southerly winds but may be completely canceled by strong northwesterly winds. The offshore extent of this current is not known but it is believed to be strongest between the 100-fathom curve and the coast; that it extends to the inside passages of southeastern Alaska is indicated by the results of current observations at several inside locations between Dixon Entrance and Cape Spencer.

Tidal currents.—Velocities of 4 to 6 knots are not uncommon in some of the inside passages. The C&GS Tidal Current Tables contain daily predictions for Wrangell Narrows, Sergius Narrows, and North Inian Pass; the tables also include current differences and other constants for many other places in southeastern Alaska.

WEATHER.—The Appendix lists Weather Bureau offices and radio stations that transmit weather information; it also includes a table of fog-signal operation and climatological tables for four stations in southeastern Alaska. The following description of general weather conditions in southeastern Alaska was prepared by the Office of Climatology, U.S. Weather Bureau.

General.—Southeastern Alaska is largely dominated by winds which come off a part of the Pacific Ocean that has been warmed by the Japanese Current. The climate of the exposed coast is most strongly marine, while that of the mainland and the inner sides of the islands is more continental. There is considerable variation of temperature and precipitation in the mountainous areas, but elsewhere the high humidity, fogs, heavy cloud cover, small temperature range, and abundant precipitation are characteristic of the maritime zone.

Pressure.—From late fall into early spring, the pressure gradients are steep, owing to the intensity of the semi-permanent Aleutian LOW which lies between the strongly established Pacific HIGH to the southwest and the continental HIGH that covers Siberia, much of the Arctic Ocean, and the Canadian northwest. At its greatest development, usually in January, the central pressure of the Aleutian LOW averages 29.53 inches (1000 millibars). In late May or early June, the Aleutian LOW weakens and shifts westward, thence northward, as the large Pacific HIGH builds up. By July, this HIGH reaches a maximum with a central pressure of 30.26 inches (1025 mb.) near 38° N., 153° W. Its northeastern ridge covers the area with a weak pressure gradient. Storms and the passages of LOWs diminish during the warmer months.

The mean-pressure pattern indications may be misleading, especially in areas of extensive cyclonic activity such as southeastern Alaska where there is an almost continuous procession of cyclones and anticyclones. Normally, these mask any picture of a semi-stationary pressure distribution.

Winds.—Southeast Alaska is vulnerable to strong winds that often reach gale force, because of its exposure to cyclonic circulations which frequently move from the southwest into the Gulf of Alaska. Surrounded by high mountain ranges along the coast, the Gulf serves as a catch basin for the often violent storms typical of northern ocean areas. Upon reaching the Gulf, many storms dissipate before affecting coastal areas, but others may hit the coast with undiminished or even increased force. Intense Gulf LOWS usually generate strong easterly or southeasterly winds over southeastern Alaska, except the northern channels such as Lynn Canal where the winds may be strong northerly or northeasterly ones.

Because of the rugged terrain and differing exposures relative to the sea, winds may vary greatly in direction and intensity. Among the passages subject to the gorge effect, the winds will naturally follow the land contours, sometimes sweeping strongly along the channels and at other times falling to a calm. However, there is seldom a month when winds of 60 to 70 mph do not reach some exposed portion of the southeastern coastline. Exposure, then, is the principal factor in coastal areas, although funneling effects under certain conditions may intensify winds at the more sheltered locations of the mainland.

Downslope winds, sometimes known as **williwaws**, which originate from the overflow of cold air from the intense HIGHS over the interior of the continent, also affect the maritime zone. Though definitely of a local nature, these winds frequently attain speeds of damaging proportions, particularly in the heavily populated Juneau-Douglas area which several times has sustained widespread damage from them. Often they are accompanied by blinding snowstorms. In this area they are known locally as **"Takus"** because they build up from strong northerly circulations over Taku Glacier and then descend through Taku Inlet and across Stephens Passage into the passes toward Juneau.

In general, winds are from the southeasterly quadrant from the last of October to the middle of May, and often are accompanied by rain or drizzle. East to northeast winds during this period often bring snow, but southwest and northwest winds bring clearing weather. A northerly wind in winter usually is accompanied by high barometric pressure, indicating clear and cold weather for several days.

In summer, local conditions largely govern the direction, persistence, and strength of winds. They frequently blow strongly along those northwest-southeast channels which have high shores. Nights are often calm; the wind starts up at sunrise, increases until about 3 p.m., and then gradually moderates after sunset.

Gales.—The gales of autumn and winter may continue

for several days. This type normally sets in gradually from the southeast, with falling pressure and bringing precipitation and low visibility. As the barometer steadies, the wind generally shifts to southwest, blows more strongly, and the weather begins to clear; however, frequent rain squalls may continue.

During summer, gales are fewer and of shorter duration, seldom lasting more than 48 hours. They usually occur as southeast winds accompanied by thick rainy weather.

Temperature.—In this southeasterly part of Alaska the annual range of temperature is small, winters are mild, and summers are cool. Temperatures here are subject to the cooling influence of the higher latitudes, in addition to the moderating effect of the ocean. Even the most southerly portion is still north of 54°40′ N. latitude. The sun never climbs very high above the horizon, and hence mean temperatures are relatively low. The winter temperatures remain low throughout the short day, and the long night rapidly dissipates the comparatively small amount of heat from the low-angled sun. In the Arctic summer, the long days of sunshine hold temperatures to a small day-to-night range. As a consequence, the seasonal temperature differences are greater, and the daily changes smaller, than those of lower latitudes.

The wider temperature range of the continental climate is found on the inner coasts of the islands and the interior mainland, but even in those areas, none of which are more than 150 miles from the sea, there is a leveling influence from the marine type of weather; temperature extremes are generally localized and of short duration. Thus the longest seasons without frost or freezing are on the outer coasts where mean annual temperatures are highest.

Occasionally, strong northerly winter winds may bring in sub-zero temperatures for brief periods from the higher elevations of the Alaskan and Canadian mainland. January mean temperatures are near 30° F. except in the southeastern area and on islands where freezing temperatures are rare. Under such conditions, ice may accumulate in the protected inlets and fiords, but ordinarily it will be broken up rather quickly by the combination of winds and strong ocean currents. For all practical purposes, waterways in the maritime zone remain open to navigation all year. Summer mean temperatures are mostly in the fifties; daily highs of 70° F. are not unusual, and extremes of 90° F. have been recorded.

Precipitation.—Winds passing over the relatively warm ocean area pick up moisture before moving against the mountain terrain, and make this region one of the rainiest in North America. Almost without exception, the LOWS that develop over the Gulf of Alaska bring general precipitation to the area. In addition, the Pacific HIGH, upon shifting eastward or northeastward in summer, may bring rainfall from the resultant strong onshore flow of warm moist air. This may occur even when insignificant amounts fall in other maritime locations.

Normally, precipitation in the mountainous areas totals from 60 to well over 100 inches a year, except on the leeward sides of the coastal mountains where it is appreciably less. It usually falls as steady light to moderate rain or snow, on an average of 220 to 240 days per year. About 40 percent of it falls in the September–November period, when the winds are most directly onshore.

Alaska's heaviest precipitation falls on Little Port Walter, which during an average of 269 days a year receives a total of more than 221 inches. Maximum monthly amounts of near 30 inches or more are reported at about a fourth of the stations, the totals generally decreasing from south to north.

Fog.—Light fog prevails over this maritime zone the whole year, and heavy fog drifts against the coast an average of 15 to 25 days a year, most of it in the summer. The most frequent heavy fog, 3 or 4 a month, is reported at Annette from July through September, but contrary to the usual pattern, the Juneau region encounters about 3 heavy fogs monthly during the September–November period. Ships along the coast report fog on an average of about 9 days a month, the highest frequency usually in August.

Summer fog most often arrives after midnight and may stay until the following noon, or possibly later. Sea fog is caused by the cooling effect of a warm, moist air mass flowing over relatively cold water. Under such conditions, the amount of fogginess depends on the spread between sea and air temperatures, and its drift toward shore depends upon the direction and intensity of the local winds.

In the winter, fog is less frequent but likely to last longer; they have been known to persist continuously for 2 to 10 days. The winter fogs may be of varying densities.

Fog along the coast can be expected with westerly winds accompanied by a moist atmosphere. Under such conditions, there is usually a fogbank seaward and patches of fog hanging about the mountain tops. Easterly and northerly winds ordinarily clear off the fog, as do southerly winds; however, the latter often bring rain or drizzle.

Cloudiness.—Cloudy weather is prevalent over southeastern Alaska throughout the year, with the most cloudiness in September through December. At Annette, the ratio of cloudy days is about 2½ times that of clear and partly cloudy days, combined. At Juneau, cloud amounts are even greater, with the ratio of cloudy to clear and partly cloudy being more nearly 3 to 1.

ICE.—The ports of southeastern Alaska usually are considered ice-free, but some ice does form in the rivers and at the heads of inlets. Floating patches of slush ice sometimes find their way into the channels but never obstruct navigation.

Icebergs and **growlers** are encountered in all months of the year off the faces of discharging glaciers; much of this glacial ice is covered with mud and stones and, when still, resembles reefs or rocks awash. Such ice seldom moves far from the parent glacier and is rarely encountered in the open sea; an exception is the Glacier Bay ice which sometimes emerges from Cross Sound and is seen 10 to 15 miles seaward of Cape Spencer.

ROUTES.—The Inside Route from Seattle, Washington, to southeastern Alaska is by way of passages through

British Columbia. See British Columbia Pilot, Volumes I and II, published by the Canadian Hydrographic Service, and H.O. Publications 10 and 11, Sailing Directions, British Columbia, Volumes I and II, published by the U.S. Navy Hydrographic Office. Sales agents for these four publications are listed in the Appendix.

The best route through British Columbia for deep-draft vessels bound from Seattle to Alaska is by usual courses out of Puget Sound, thence across Strait of Juan de Fuca northeastward of Hein Bank, 56 miles from Seattle, into the main channel of Haro Strait, thence into Strait of Georgia through Boundary Pass.

The route through Strait of Georgia passes 1 mile north of Ballenas Islands, 150 miles from Seattle. Continuing northwestward, the vessel enters Discovery Passage and encounters Seymour Narrows, 216 miles from Seattle, where the current velocity reaches 10 knots; the C&GS Tidal Current Tables contain daily predictions for Seymour Narrows.

From Discovery Passage the route is through Johnstone Strait, Race Passage, Broughton Strait, Queen Charlotte Strait, Goletas Channel, Christie Passage, and Gordon Channel into Queen Charlotte Sound 1.5 miles west of Egg Island Light, 347 miles from Seattle. From Queen Charlotte Sound the route continues northward through Fitz Hugh Sound, Milbanke Sound, Grenville Channel, and Chatham Sound to the Canada-Alaska boundary which crosses the inner part of Dixon Entrance 610 miles from Seattle.

The Inside Route northward of Dixon Entrance is through Alaska waters. Revillagigedo Channel and part of Tongass Narrows lead to Ketchikan, 659 miles from Seattle. The route through Tongass Narrows joins Clarence Strait at Guard Island and continues northwestward to Stikine Strait, which leads northward to Wrangell, 749 miles from Seattle, or to Wrangell Narrows, 756 miles from Seattle.

Vessels that wish to avoid Wrangell Narrows can go through Snow Passage, at the head of Clarence Strait, and continue through Sumner Strait and Decision Passage to sea or up Chatham Strait, Frederick Sound, Stephens Passage, and Gastineau Channel to Juneau. Vessels bound for Skagway continue up Chatham Strait and Lynn Canal.

The route through Wrangell Narrows enters Frederick Sound near Petersburg, 771 miles from Seattle, and continues northward through Stephens Passage and Gastineau Channel to Juneau, 879 miles from Seattle. Vessels using Wrangell Narrows proceed from Stephens Passage through Favorite Channel and Lynn Canal to Skagway, 962 miles from Seattle.

Vessels bound for Sitka, 883 miles from Seattle, sometimes proceed to sea at Dixon Entrance or Cape Decision and make an outside approach through Sitka Sound. Those desiring shelter use the Inside Route through Wrangell Narrows and enter Peril Strait from Chatham Strait; thence their courses are through Sergius Narrows, Salisbury Sound, Neva Strait, and Olga Strait to Sitka.

The Inside Route is often used by vessels bound for Yakutat and other ports to the northwestward. From Juneau the route is southward in Gastineau Channel, thence through the northern part of Stephens Passage, thence through Saginaw Channel and part of Lynn Canal to the north end of Chatham Strait, and thence through Icy Strait and Cross Sound to the sea. The principal ports in southeastern Alaska may also be reached from seaward through the many deep entrance channels.

Pilotage.—Licensed pilots are available at Port Angeles and Seattle, Washington, and at Anchorage, Alaska, but they must be arranged for in advance. Pilotage is not compulsory for Alaska ports or for the inside passage through British Columbia but it is frequently advisable. Vessels calling at canneries usually can arrange by radio to have one of the cannery men come out and pilot the ship to its berth.

Towage.—Tugboats are stationed at the principal ports of Washington and British Columbia. Any towing that is required in southeastern Alaska usually is done by cannery tenders and other small local craft.

Supplies.—Alaska-bound vessels usually obtain their groceries and marine hardware at Puget Sound ports. The principal towns in southeastern Alaska can supply groceries and limited amounts of marine hardware; nearly all the canneries and mining settlements can supply some groceries.

Water is available through pipe and hose at most of the ports and operating canneries in southeastern Alaska; it is also obtainable from fresh-water streams in all parts of the area. Gasoline, diesel fuel, and lubricating oils are available in all the larger towns and at many of the operating canneries.

Repairs.—There are no repair facilities for large vessels in southeastern Alaska. The nearest major facilities are in British Columbia and Washington. Small vessels frequently are beached for hull repairs, and minor engine repairs can be made at most of the principal ports.

Some of the ports and canneries have small marine railways, slipways, or grids but these are subject to frequent change because of destruction by ice, abandonment of canneries, or plain discontinuance of service.

Communications.—There is scheduled steamer and barge service from Seattle to southeastern Alaska ports. Airplane service also is available to coastal and interior points.

The Signal Corps of the U.S. Army operates the Alaska Communication System, a radio network that includes coastal stations with ship-to-shore service. Connecting with the network are the stations operated by the Alaska Native Service and other Governmental agencies and by various mining, logging, and cannery activities. The Alaska Communication System stations listen on 500 kc. and are open to public correspondence; most of the other stations have no fixed hours of service and some are closed between the normal periods of Alaska fishing operations. Further information about Alaska radio stations may be obtained from the Alaska Communication System, U.S. Army, Seattle, Washington, or from the Federal Communications Commission, Washington 25, D.C.

Standard time.—Most of the area covered by this Coast Pilot uses Pacific standard time, which is eight hours slow of Greenwich mean time. The exception is Skagway which uses 135° W. standard time, nine hours slow of Greenwich. Examples: When it is 10 a.m. at Greenwich it is 2 a.m. at Juneau, Ketchikan, and Sitka and 1 a.m. at Skagway.

Holidays.—Alaska's legal or public holidays are:

January 1, New Year's Day.
February 12, Lincoln's Birthday.
February 22, Washington's Birthday.
March 30, Seward's Day.
May 30, Memorial Day.
July 4, Independence Day.
September's 1st Monday, Labor Day.
October 18, Alaska Day.
November 11, Veterans Day.
November's 4th Thursday, Thanksgiving Day.
December 25, Christmas Day.

4. DIXON ENTRANCE TO KETCHIKAN

Chart 8002.—Dixon Entrance is the southern approach from the Pacific Ocean to the inner channels of southeastern Alaska and the northern seaward approach to those of British Columbia. It is entered between Queen Charlotte Islands on the south and Dall and Prince of Wales Islands on the north. It extends in a general easterly direction from Cape Muzon and Langara Island to the Dundas Islands, a distance of about 75 miles, with an average width of more than 30 miles; it then contracts to a width of about 8 miles between Cape Fox and Dundas Island, and continues with this width to the mouth of Portland Inlet, a distance of 17 miles.

The boundary line between Alaska and British Columbia runs through Dixon Entrance.

Bowie Seamount (Chart 8500) is a sharp pinnacle with a depth of 24 fathoms in latitude 53°19′ N., longitude 135° 40′ W.

Learmonth Bank lies in the fairway of the western entrance of Dixon Entrance between 8 and 18 miles northward of Langara Island and inside the 100-fathom curve. The bank is about 12 miles long, northwest and southeast, and has a width of about 5 miles. The least depth is 19 fathoms, over a bottom of sand, rock, and gravel.

Boundary lines of inland waters.—The lines established for the waters of southeast Alaska are described in **§ 82.275,** Chapter 2.

Winds.—In winter, northerly gales occur at times and draw down Portland Inlet and across the northeastern end of Chatham Sound, and when heaviest, render the crossing from Dundas Island to Cape Fox hazardous for all except good-powered vessels. With southwesterly gales a heavy beam sea is encountered in making the crossing.

Currents.—In Dixon Entrance, the flood current, going eastward around Langara Island, sets along the north shore of Graham Island. In the area about midway between Rose Spit and Dundas Island it divides, one part sets northward past Dundas Island and the other southward into Hecate Strait.

The turn of the current in the neighborhood of Rose Spit coincides approximately with the times of high and low water. At times the streams run as high as 4 knots in the neighborhood of Rose Spit, which causes heavy overfalls having the appearance of shallow water in depths of 10 fathoms and upward. This vicinity should be navigated with great care; Rose Spit should be given a wide berth.

At Cape Muzon the flood current sets around the cape northeastward and the ebb southwestward, with a velocity of about 2.5 knots at strength.

At Nunez Rocks and Cape Chacon the currents are irregular and are affected by storms. The flood generally sets eastward or northeastward. From the cape to Nichols Bay there is apparently an eddy with a westerly set close to the shores. Between the cape and the rock off the cape, the current apparently always runs westerly, although not strong during the last half of the flood. North of Cape Chacon an eddy runs to the southward, close to the shore. Off the cape a current of between 2 and 3 knots has been experienced.

On the ebb the general direction of the current is to the westward. From Cape Chacon it runs in the direction of Nunez Rocks, probably forced to the southward by the current from Nichols Bay; the latter sets eastward as far as the cape and then turns southward. The current from the southern entrance of Nichols Bay runs southeastward until it meets the main current when it turns westward around Point Nunez. Westward of Nunez Rocks the ebb current is westward, but is affected by currents from inlets; there are small eddies along shore.

Between Cape Chacon and Zayas Island on the south, and Duke Island and Cape Fox on the north, the tidal currents are much confused. In bad weather the heavy and confused sea sometimes has the appearance of breakers.

Between Dundas Island and Cape Fox the flood current sets eastward with an average velocity at strength of 2.0 knots and the ebb current sets westward with an average velocity at strength of 3.0 knots.

For daily predictions for several places in Dixon Entrance the Tidal Current Tables should be consulted.

Additional information concerning currents in these waters is given in Canadian Hydrographic Service Publication British Columbia Pilot, Volume II, Northern Portion of the Coast of British Columbia.

Directions.—Because of the numerous dangers and uncertain currents, the navigation of Dixon Entrance at night or in thick or foggy weather is attended with some risk. In approaching from southward, the light, fog signal, and radiobeacon on Langara Island is a sufficient guide to the entrance. In approaching from westward or northwestward, Forrester Island is a good landmark. The light on Cape Muzon and the light on Cape Chacon are good guides when in their vicinity, but Nunez Rocks, about 3.2 miles southwestward from Cape Chacon, should be kept in mind, as they are not marked. The unattended light on Barren Island is also a good guide when going to the eastern part of Dixon Entrance; it is advisable to set a course southeastward of the island in passing.

Charts 8152, 8102.—Graham Island forms the southern side of Dixon Entrance for a distance of 50 miles from Langara Island to Hecate Strait. Its northwestern end is mountainous with **Pivot Mountain** the most conspicuous. This mountain is 2.5 miles back from the shore and is of rounded form, somewhat detached from others; it can be seen for about 50 miles in clear weather. **Tow Hill** is a conspicuous landmark on the northeast end of the island,

rising above the low and featureless land in its vicinity. It is on the coast, and is fronted by a perpendicular cliff nearly 400 feet high, composed of columnar volcanic rocks facing the sea and sloping gradually to the southward.

Langara Island, on the south side of the western end of Dixon Entrance, is a small irregularly shaped, densely wooded island, close off **Cape Knox,** the northwesternmost point of Graham Island. Near the middle of the island is a succession of rounded hills of nearly uniform height extending in an easterly direction.

Langara Point Light (54°15.3′ N., 133°03.5′ W.), 160 feet above the water, is shown from a 57-foot white hexagonal tower on the northwestern end of Langara Island. A fog signal, pointing 329°, and a radiobeacon are at the light. A white dwelling is about 135 yards eastward of the light.

Forrester Island, lying about 14.5 miles off the Dall Island shore, is a prominent landmark for the approach to Dixon Entrance from northwestward. The island is wooded and mountainous, the highest peak being located in about the center of the island.

Cape Muzon, the southern extremity of Dall Island, forms the northwestern headland of Dixon Entrance. It is heavily wooded and rises to a rounded peak 2 miles northwestward of the extremity of the cape. Off the eastern end of the cape is a group of small islands and rocks, and a breaker lies 0.3 mile off the south shore of the cape. Vessels in passing should give the cape a berth of at least 1 mile.

Cape Muzon Light (54°39.9′ N., 132°41.4 W.), 75 feet above the water, is shown from a small white house on the southern extremity of the cape.

Local magnetic disturbance.—Differences of as much as 4° from normal variation have been observed at Cape Muzon.

Chart 8145.—Point Marsh, about 13 miles eastward of Cape Muzon, is a group of rocky islets, all of which are comparatively low and wooded, lying close to the main shore of Prince of Wales Island. Between 1 and 2 miles back of the point, the ground rises evenly with several irregular knobs showing along the slope. About 3 miles northeastward of the point is a prominent, nearly bare hill with rounded top. **Point Marsh Light (54°42.8′ N., 132°17.6′ W.),** 66 feet above the water, is shown from a small white house on a small islet about 1 mile southeastward of Point Marsh. Excellent anchorage for small craft can be had in **Minnie Bay,** a small bight in the main shore back of Point Marsh. Enter westward of the small charted islets inside the entrance and run fairly close-to in order to avoid a reef extending 30 feet out from the western shore opposite the southernmost islet.

Brownson Bay, about 1.5 miles northeastward of Point Marsh, is narrow, and at its entrance, is somewhat obstructed by islets and rocks. It affords indifferent anchorage in about 15 fathoms, 0.2 mile southward of the rock, which is awash, near the head of the bay. In entering, favor the western side of the bay, taking care to avoid a rock awash that lies about 0.6 mile northeastward of the islets off the western point at the entrance.

Little Brownson Bay, on the east side of the entrance to Brownson Bay, affords anchorage for small craft. The bay is entered from the southward, but local knowledge is required; the northern passage can only be used by very small boats. Williwaws sweep across the bay during southeast gales.

Surf Point, about 2.5 miles westward of Point Nunez, rises rapidly to a knob, and then to higher ground to the northward. **Brown Bear Rock** is a prominent rock close to the point. A sunken rock, cleared to 6 fathoms, lies about 0.4 mile southward of the point, with deep water inshore. Tide rips, severe for small craft, are found in the vicinity.

An inlet, about 1.2 miles eastward from Surf Point, is too deep for anchorage and is open and exposed. Foul ground extends about 0.2 mile off the point on the east side of the inlet.

Bert Millar Cutoff is the passage to Nichols Bay westward of Bean Island. It forms a bight at each end, narrowing at the center to a channel about 30 yards long and 10 yards wide. There is a depth of about 1¾ fathoms in the narrow part of the channel, and there are sunken rocks in the bight at the northern end. At times the current through the channel is very swift.

Bean Island is wooded and has a number of rounded, steep-sided, rocky knobs. From westward it shows as a rounded hill which stands well above the general level of the island. Off the southeast point of the island is a small wooded island from which sunken rocks extend.

Point Nunez, about 2.7 miles westward of Cape Chacon, is the southeastern extremity of Bean Island. It has several rocky ridges, with bare bluffs 150 to 200 feet high on the seaward face.

Nichols Bay, is about 2.5 miles westward of Cape Chacon. Three islands divide the entrance into two channels. From the southern extremity of the southern island, irregular bottom with 2- and 2½-fathom spots extend across the entrance of the southern channel to a 4¾-fathom spot about 0.4 mile to the northeastward of Point Nunez. During severe southerly gales seas pile up heavily at the entrance and are reported to break entirely across it at times. A daybeacon, 40 feet above the water, is on the eastern side of the entrance.

There are two anchorages in the bay, one in each of the two bights on the southwest shore. In entering the first bight keep well off the northwestern end of the northern island to avoid rocks. Anchor in 16 fathoms, mud bottom, 250 yards offshore. The second anchorage is to the northwestward of the peninsula, in depths of 15 fathoms, 300 yards offshore.

Nichols Lake, a large fresh-water lake, empties into the head of the bay through a stream. Small boats anchor off the flats at the mouth of this stream.

Directions.—When about 1 mile from the entrance, bring the bay wide open and head for the center of the channel. Stand in between the kelp patches. Favor the north point at the entrance, and then follow midchannel courses. The narrowest part of the channel, about 75 yards wide, is 1 mile inside the entrance, where the least depth is 7 fathoms.

The south channel, used by small craft, leads to the southward of the islands. Fishing craft anchor in the lee of the 20-foot rock about 270 yards off the northeast shore of Bean Island, and in the channel between the islands.

Cape Chacon, the southeastern point of Prince of Wales Island, is about 23 miles eastward of Cape Muzon. **Cape Chacon Light (54°41.5′ N., 132°00.9′ W.),** 50 feet above the water, is shown from a small white house on the southern extremity of the cape.

From northeast and southwest quadrants the cape is easily recognized by three hills; the outer appears as a perfect cone; the second is slightly higher and somewhat rounded; the third has a flat top. The land to the northwestward is high and broken.

A rock, awash at extreme low water and usually showing as a breaker, is 260 yards southeastward from the cape. The pass between the rock and the cape has depths of 5 fathoms and is used by small craft. For a distance of about 0.5 mile from the cape tide rips are severe for small craft at times.

Nunez Rocks, about 1.4 miles 175° from Point Nunez are bare at half tide and usually show as a breaker. Shoal water extends 550 yards southeastward to a 1½-fathom spot which frequently shows as a separate breaker. A 1½-fathom spot is about 400 yards northeastward of the rocks. The channel between Nunez Rocks and Point Nunez is clear. The rocks when passed to the southward should be given a berth of 0.8 mile.

Chart 8075.—Duke Island, on the north side of Dixon Entrance between Clarence Strait and Revillagigedo Channel, is low and heavily wooded, and shows numerous round-topped hills. **Mount Lazaro** at its south end is a broad-topped mountain, and the only part of the island visible at a distance of over 25 miles. The south and southwest sides of the island should be avoided, as rocks and reefs extend about 7 miles offshore. Dangers are marked by kelp during the summer months, but it is probable that this safeguard is lacking during the fall and winter. The farthest outlying dangers are Hassler Reef, West Rock, Club Rocks, Yellow Rocks and Barren Island.

Judd Harbor, on the south shore of Duke Island, lies northward of the east end of **Kelp Island.** It offers excellent shelter with swinging room for vessels up to 175 feet in length (short scope). When entering the harbor the compass should not be relied upon due to local attraction.

The best entrance is northward of East Island. When abreast of the northeast point of Kelp Island, steer mid-channel toward the prominent point marking the west side of the entrance to Judd Harbor. When about to round into the bay give the point eastward a fair berth due to a sunken rock 130 yards off that point. Anchor in the center of the bay in 4 fathoms, sticky mud bottom. This anchorage is used extensively by fishing vessels during fishing season and may be found congested during that period.

Anchorage on the north side of Kelp Island, while good, is not recommended for use except for those with local knowledge, due to the shallowness of the eastern entrance and the numerous reefs in the western entrance. Currents through this passage are very strong at times.

Kelp Island Anchorage, a bight in the eastern end of Kelp Island, offers fair shelter for small boats. Anchorage is in from 2 to 7 fathoms, rock and sand bottom. Piles have been driven along the south shore.

Local magnetic disturbance.—Extreme magnetic disturbances, with differences of as much as 50° have been observed southeastward of Duke Island. The magnetic compass should not be relied upon within the area outlined in magenta on the charts.

East Island is a small island 2.5 miles southward of **Duke Point,** the easternmost point of Duke Island. In rounding East Island great care should be exercised because of the outlying rocks to the westward, the magnetic disturbance, and the uncertainty of the tidal currents.

Hassler Reef is an extensive shoal area with depths of 3½ to 6 fathoms lying about 7.8 miles 260° from Mount Lazaro. The reef is covered by heavy kelp during the summer months and has deep water close-to. Very irregular bottom extends 3 miles to the southward of Hassler Reef and passage over that section is not recommended.

West Rock, is 6.2 miles 227° from Mount Lazaro. A rock with 2 fathoms over it and marked by kelp is about 0.6 mile southward of West Rock.

Club Rocks, two in number, bare, and surrounded by reefs and kelp, are about 4.4 miles 173° from Mount Lazaro. **Yellow Rocks,** two in number and yellowish in color, the larger rock showing some vegetation, lie about 7.3 miles 141° from Mount Lazaro. They are surrounded by kelp.

Caution.—Vessels should not go inside the line of Hassler Reef, and West Rock and Club Rocks. These waters should be navigated with great caution and every appearance of kelp should be avoided. It is quite possible that isolated pinnacle rocks may exist that show no kelp. There is deep water close to Yellow Rock and Barren Island.

Barren Island is a bare rock 30 feet high, about 8.5 miles 177° from Mount Lazaro. There are other small rocks and some kelp near it, but there is deep water within about 0.2 mile in all directions. **Barren Island Light (54°44.7′ N., 131°20.9′ W.),** 85 feet above the water, is shown from a white cylindrical house on a 59-foot pyramidal skeleton steel tower, on the summit of the island.

West Devil Rock is a dangerous ledge in the northeastern part of Dixon Entrance, about 15.5 miles 212° from Mount Lazaro. The highest part of the rock bares 10 feet and foul ground, on which the sea breaks, extends 0.3 mile southeastward from it. A 2½-fathom shoal, on which the sea breaks almost continuously in moderate weather, lies 0.6 miles 333° from the rock, and a shoal of small extent with 6 fathoms over it, lies 2.3 miles 142° from the rock.

East Devil Rock which bares 2 feet, is about 3.5 miles northward of Zayas Island. The channel between this rock and **Zayas Island Reef** is apparently clear, but the north coast of Zayas Island should not be approached closer than a mile.

Chart 8102.—Celestial Reef is about 10 miles 153° from West Devil Rock. It is about 1 mile long and has three heads with 1 fathom over them, one near its north end and two near its south end. The depths over the remainder of the shoal are 10 to 20 fathoms. A 10-fathom spot is about 4 miles northward and an 8-fathom spot 2 miles southward of the center of the reef.

Zayas Island, in the northeastern part of Dixon Entrance and about 11.5 miles southeastward of Barren Island, is wooded, flat-topped, and high near the southern end. A rock with 4 feet over it is about 0.7 mile northwestward of **Aranzazu Point,** the northwestern extremity of Zayas Island. Foul ground marked by kelp extends along the north shore of the island with several 5-fathom spots nearly a mile north of the island.

McCulloch Rock, about 4 miles west of **Jacinto Point,** the southwestern extremity of Zayas Island, is a pinnacle rock with a depth of 6 feet over it. Two 3-fathom patches lie about 0.5 mile southwestward and eastward, respectively, of the rock, and a 5-fathom shoal is about 1.5 miles northeastward of it.

Dundas Islands in the eastern part of Dixon Entrance, consist of 4 large islands, **Dundas, Baron, Dunira,** and **Melville;** and numerous small islets and rocks. Dundas, the northwesternmost and largest island, has a number of conspicuous mountains, of which **Mount Henry,** towards the southern end of the island, is the highest. In the northwestern part of the island are two conspicuous hills. **Slab Hill,** flat-topped with a knob, is conspicuous near the northeastern end of the island.

The coasts of the four large islands of the group are much indented by small creeks and bays.

Holliday Island Light (54°37.4′ N., 130°45.5′ W.), 30 feet above the water, is shown from a white slatted daymark on a concrete base on the north end of **Holliday Island,** which is 0.3 mile off the northeastern end of Dundas Island.

Chart 8141.—Cape Fox, on the northern side of Dixon Entrance, forms the western side of Nakat Bay and the eastern point of the entrance to Revillagigedo Channel. The cape is mountainous and wooded, and wooded islets are close off its southern shore. The cape terminates in remarkable high white cliffs, with a conspicuous saddle-shaped mountain, **Harry Saddle** about 2 miles back. A small-boat channel between Fox Island and the cape, is narrow and crooked, and should not be attempted without local knowledge. A rock which bares is 400 yards 070° from the eastern tip of **Fox Island,** a small island 0.3 mile off Cape Fox.

Tree Point Light is on the northeast side of the lower end of Revillagigedo Channel, about 3.7 miles northwestward of Cape Fox. It is described later in this chapter.

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Lord Islands, lying about 2.5 miles southeastward from Cape Fox, are in two groups, separated about 0.7 mile, and have a number of islands in each group, with a clear channel between the groups. The larger islands are wooded and 100 to 200 feet high. About the **Lord Islands** are several bold and bare rocks. Sunken rocks and kelp fringe these islands and shoal water extends about 0.5 mile northward and northwestward of the northerly group. The recommended channel into Nakat Bay is to the westward of the islands and **Thistle Rock,** favoring the Cape Fox shore.

Lord Rock, about 10 feet high, lies about 0.7 mile southwestward from the south group of the Lord Islands. A light, 42 feet above the water, is shown from a small white house on a steel skeleton tower on the highest part of the rock.

Nakat Bay, making northward between Cape Fox and Tongass Island, is the entrance to Nakat Inlet, and is the western approach to Port Tongass. The bay does not afford anchorage.

Boat Rock, 5 feet high and marked by a light, is close to the western shore at the entrance to Nakat Bay. The light, 46 feet above the water, is shown from a small white house on a skeleton tower on the southwest end of the rock.

Craig Rock, near the middle of the bay and about 0.7 mile from the west point of Tongass Island, is awash at extreme low water, with deep water all around. It breaks in a heavy sea and is not marked by kelp.

Harry Bay on the northwest side of Nakat Bay is deep and exposed to the southeastward. **Slim Island** is close to the western shore at the entrance. A boat passage is between the island and the mainland, but the island shore must be kept close aboard as the western half of the passage is foul. A shoal with 6¾ fathoms over it, is 0.4 mile 116° from the south end of Slim Island. **Ledge Point** should be passed at a distance of 0.5 mile to clear the rocks off the point.

Nakat Inlet extends in a northerly direction for about 8 miles. The shores are steep and heavily wooded to the water's edge. The main inlet is deep and affords no anchorage except near its head. The group of small, wooded islands near the head of the inlet provides shelter for small craft. Anchorage may be had in 8 to 13 fathoms. The inlet is clear of obstructions except near its head or close inshore.

Local magnetic disturbance.—Differences of as much as 5° from the normal variation have been observed in the west shore of Nakat Inlet about 1.25 miles north of Surprise Point.

Nakat Harbor makes off from the southeastern part of Nakat Inlet and is separated from it by a chain of wooded islands. A V-shaped flume is maintained by the Nakat Packing Company for watering small boats at the ruins of the abandoned cannery on the eastern shore of the harbor eastward of Observation Rock. In the southern part of the harbor, about halfway up the arm, off a small bight having a gravel beach, anchorage and shelter may be found for vessels of moderate size in 18 fathoms. There is also anchorage in the northern arm of Nakat

Harbor, but the shelter is not so good. A reef with two pinnacles which bare 3 feet is 200 yards from the western shore about 0.3 mile northward from **Simonton Point. Observation Rock,** in the middle of Nakat Harbor, is about 6 feet high, with sunken rocks extending about 250 yards southeastward and northwestward from it. A deep channel is between the rocks and the shore, but the shore must be given a berth of over 100 yards.

The best channel for entering Nakat Harbor is southeastward of the southeasternmost islet of the chain separating it from Nakat Inlet.

Excellent anchorage may be had in 18 fathoms, mud bottom, in the southwest arm of Nakat Harbor, about 0.6 mile southeastward of **Surprise Point.** Passage to the head of this arm is obstructed by a rock baring 3 feet in the middle of the constricted part of the arm. Small vessels should favor the west shore to avoid the rock and the extensive flats along the eastern shore. The head of the arm is used for storing fish traps. At high water this bay is connected with the small bight about 0.7 mile northward of the light on Tongass Reef, by a narrow passage which is obstructed by trees and can only be navigated by small boats.

Tongass Reef, on the northeast side of the bay, about 0.5 mile northward of Tongass Island, is awash at high water. **Tongass Reef Light (54°47.2′ N., 130°44.6′ W.),** 40 feet above the water and shown from a small white house on a skeleton tower on the north side of the reef, marks the northern entrance to Port Tongass. **Passage** and **Track Rocks,** between Tongass Reef and the north point of Tongass Island, cover at three-quarter flood.

Port Tongass is a small harbor formed by the passage between Tongass Island and the mainland. **Tongass Island** is low and, except on the northeast side, has ledges and sunken rock extending well out on all sides. There is a launch passage immediately northward of Tongass Island but this channel is tortuous and obstructed and should be used only with local knowledge. Port Tongass is sometimes used as an anchorage, but the bottom is hard, and with wind and changing tidal currents a vessel is liable to foul and drag her anchor.

The anchorage is 200 yards from the northeast shore of the harbor, eastward of **Fort Point** in about 20 fathoms, hard bottom. The flood current sets northwestward through the anchorage with a velocity of about 1 knot. The anchorage may be entered by three channels, the southeastern and southwestern entrances being described under Sitklan Passage.

The northern entrance between Tongass Reef and the mainland is the one recommended and is the best entrance for vessels approaching from westward.

Sitklan Passage, except for its western entrance between Tongass and Kanagunut Islands, is a deep narrow passage with steep wooded shores extending in an east-northeasterly direction between the mainland and the northwestern shores of Kanagunut Island and **Sitklan Island** from Nakat Bay to Tongass Passage. It forms the southeastern and southwestern approaches to Port Tongass. The eastern entrance of the passage from Tongass Passage is northward of **Point Mansfield.** This channel, with depths of 16 to 36 fathoms, is fairly straight and is about 300 yards wide. **Dark Point,** the turning point from Sitklan Passage into Port Tongass, has a bare rock about 5 feet high close-to.

The western entrance, on the south side of Tongass Island, is obstructed by rocks and kelp, but is much used by small vessels with local knowledge. Strangers should use this entrance only with small craft at one-quarter flood or better. All dangers in the passage are marked by kelp. A circular shoal with a least depth of 2¼ fathoms is about 0.6 mile northwestward of **Tingberg Island** in the western entrance. When rounding **Katakwa Point,** the southeastern extremity of Tongass Island, care should be exercised to favor the eastern shore of Port Tongass which is steep-to and clear of dangers.

Lincoln Channel is the narrow passage between Kanagunut and Sitklan Islands. It is very narrow at the north entrance with a controlling depth of 9 feet in midchannel. In the southern part of the channel, about 0.2 mile northward of the island in the bight, is a rock in midchannel with ¾ fathom over it. A shoal with a depth of 1 fathom is about 0.5 mile 006° from **Garnet Point,** the southern extremity of Kanagunut Island.

The ruins of Port Tongass village are located on the northeastern side of the channel, about 0.8 mile from the northwestern entrance.

Kanagunut Island is low and heavily wooded and is fringed along its southwest shore by rocky ledges extending 200 to 700 yards from the island.

Tongass Passage is a deep passage with steep shores, between Sitklan and Wales Islands, extending from Dixon Entrance in a northwesterly direction. Off the entrance to Sitklan Passage it bends to the northeastward and, separating Wales Island from the mainland, forms the western entrance to Pearse Canal. Tongass Passage is entered between **Haystack Island,** a steep wooded islet, and **Island Point,** the southeastern extremity of Sitklan Island. From **Bartlett Point,** the western extremity of Wales Island, to **Phipp Point,** on the north shore of Wales Island about 1 mile northeastward of Bartlett Point, a midchannel course will lead through deep water.

Fillmore Inlet joins Pearse Canal on the Alaska side at the southwest end of Fillmore Island, and separates that island from the mainland; it extends northeastward, and is comparatively free to navigation, but there are numerous rocks and reefs close inshore. The narrow entrance beyond the group of islets at the head of this inlet leads into two consecutive basins, each of considerable size. The inlet has no value as an anchorage.

Willard Inlet is a narrow inlet extending in a northwesterly direction from the northwestern side of Fillmore Inlet, about 1.5 miles northward of **Male Point,** the southwestern extremity of Fillmore Island. It is very narrow at the entrance and the currents have great velocity, forming swirls that extend well out from the mouth. The times of high and low water inside the inlet are about 1 hour later than at other places in the vicinity, and the rise and fall about 2 feet less. This inlet can only be entered at slack water and has no value as an anchorage.

Edward Passage separates Fillmore Island from the mainland northward and connects Fillmore Inlet with Pearse Canal. This passage is narrow, foul, and only navigable by small craft with local knowledge.

Pearse Canal has a length of about 25 miles from Tongass Passage to its junction with Portland Canal off Tree Point, the northern extremity of Pearse Island. The British Columbia shore is formed by **Wales** and **Pearse Islands,** and the Alaskan shore by Fillmore Island and the mainland.

The western entrance to Pearse Canal is to the southward of a group of heavily wooded islets which lie about 0.8 mile southwestward of Male Point. **Pearse Canal Light (54°47.1′ N., 130°36.5′ W.),** 16 feet above the water, is shown from a small white house on the south point of the 150-foot island in the entrance to Pearse Canal. A rock with 1¾ fathoms over it is 0.1 mile northward of the light. To enter from the westward, pass in midchannel between this rock and the southernmost of the islets southward of Male Point.

For daily predictions for places in Pearse Canal; see the Tidal Current Tables.

The **Safa Islands,** mostly wooded, lie on the southern side of the channel off the entrance to Wales Harbor.

Fillmore Island, forming the northwestern shore of Pearse Canal and separated from the mainland by Fillmore Inlet and Edward Passage, extends in a northeasterly direction. Off its south shore are several wooded islets; passage behind the islets is not recommended except for small craft with local knowledge.

Regina Cove indents the south shore of Fillmore Island about 2 miles from Male Point. Anchorage is available in the center of the bay in 14 fathoms, mud bottom. A small shoal of 1¾ fathoms, with deep water surrounding it, lies almost in midchannel about 0.2 mile off the entrance to the cove.

Wales Harbour, on the British Columbia side of Pearse Canal, about 1.5 miles from Tongass Passage, affords good anchorage in 15 to 18 fathoms, soft bottom; its entrance is somewhat obstructed by islets and rocks, and only vessels with local knowledge should attempt to enter it. The usual anchorage is northward of the larger island near the head of the harbor. In entering, follow the southwesterly shore at a distance of about 200 yards until past the shoal in the entrance to the harbor.

At the head of the harbor are three arms, the middle and largest one opening out into a basin. An island with an islet close southeastward of it nearly closes the entrances to the western and middle arms; the channel for entering them is westward of the islands, but the chart is the best guide for navigating these waters.

Wales Passage, between Pearse Island and Wales Island on the British Columbia side of Pearse Canal, is free from midchannel dangers.

Winter Inlet, the entrance to which is about 1.3 miles northeastward of the northern entrance to Wales Passage, indents the northwestern shore of Pearse Island. It affords secure anchorage for small craft; the holding ground is good and there is ample swinging room in the wider part. The northern shore is bold, except where small sandspits make out at the mouths of streams. In entering, favor slightly the southern shore until past the first spit on the northern side, and then keep the northern shore close aboard when passing the bight on the south side to avoid a rock awash at high water lying about 75 yards off a small wooded islet. Ice forms in the harbor during winter, making it unsafe for small craft shelter.

Hidden Inlet, a narrow arm, extends into the mainland in a northerly direction from Pearse Canal, about 8 miles southward of its junction with Portland Canal. The entrance to this inlet is less than 150 yards wide, and through it the tidal currents set with a velocity of 8 to 10 knots, forming swirls that extend well into Pearse Canal. The main body of the inlet is about 3.5 miles long, varying in depth from 30 to 70 fathoms, but there is only 2½ fathoms at the entrance. It can be entered only at slack water, and is of no value as an anchorage.

The cannery on the south side of the entrance to **Hidden Inlet** is operated by the Nakat Packing Corporation. The cannery wharf has a face 210 feet in length at which the depths range from 27 feet at the northeastern end to 11 feet, rock bottom, at the other end. Large vessels must keep well to the eastern end of the wharf at low water to avoid grounding. A starboard landing should be made as the stern will then be in deep water. The tidal currents running out of Hidden Inlet must be guarded against on approaching the wharf. On the flood, the current sets toward the wharf, and on the ebb, it sets away from the wharf. This latter current is felt most strongly about 100 yards off and decreases toward the wharf face. There is a float inside the wharf at the northeastern end and a larger float with an airplane ramp is secured to the southwestern end.

Northward of the main pier is a small oil wharf with a controlling depth of 8 feet at the end. Gasoline and fuel oil are available through a pipeline; lubricating oil can also be secured.

The cannery operates a general store and limited supplies can be obtained. Except during the winter months, fresh water is piped to the main wharf. A radiotelephone station is operated during the canning season. Mail boats stop at the cannery but there is no post office.

A rock with 2 fathoms over it, and marked by a buoy, is about 0.3 mile southeastward of the cannery wharf. Small vessels pass on either side of this rock. **Yelnu Islets** are two prominent islets on the western side of Pearse Canal, about 0.6 mile southward of the cannery. The southern islet is wooded and the northern one is grass-covered.

Chart 8053.—Portland Canal extends from its junction with Pearse Canal and **Portland Inlet** at **Tree Point** for about 57 miles in a general northerly direction to the towns of Hyder in Alaska and Stewart in British Columbia. The channel is clear and deep, and there are no dangers with the exception of a rock which bares, about 0.2 mile off the west (Alaska) shore, 2.3 miles above River Point.

Reef Island is close off the western shore, abreast **Spit Point,** at the entrance to Portland Canal. **Reef**

Island Light (55°04.8′ N., 130°12.1′ W.), 19 feet above the water, is shown from a small white house on the south end of the island.

Harrison Point, high and bold, is 2.5 miles northward of Reef Island. **Dickens Point**, on the eastern shore, is 4 miles northward of Spit Point. A black rock 8 feet high is close southward of Dickens Point and a drying ledge extends a short distance from it.

Sandfly Bay, on the western shore abreast Dickens Point, 14.5 miles above Hidden Inlet, is of no value as an anchorage. **Stopford Point**, bold and conspicuous, is on the eastern shore about 3 miles above Dickens Point.

Halibut Bay is on the western shore of Portland Canal, about 4 miles above Sandfly Bay. Halibut Bay is free of hidden dangers. Its shores are generally bold, but on each side near the entrance are sandy beaches with shoals extending 80 yards offshore, and low grassy land running 100 yards back. Near the head of the bay extensive flats, which bare, make out from the western shore nearly all the way across leaving a narrow channel close to the east side, through which 5 feet can be carried to a narrow basin with depths of 4 to 7 fathoms and which is suitable only for small craft.

Halibut Bay affords anchorage for vessels in the middle of the bay in 10 fathoms, a little over 0.2 mile above **Astronomical Point**, the northeast point at the entrance, and abreast a rocky point at the north end of the sand beach on the west side, where the anchorage is 450 yards wide; also 700 yards farther up abreast the north end of the sand beach on the east side, in 10 fathoms, where the anchorage is 300 yards wide.

Logan Point, on the eastern shore, is 4.5 miles northeastward of Stopford Point.

Camp Point on the western shore about 4.5 miles northeastward of the entrance to Halibut Bay, is wooded and precipitous.

Hattie Island is in midchannel about 6 miles above Halibut Bay; it is about 700 yards long and has some stunted brush growing on it. A light 21 feet above the water is shown from a red lantern on top of an orange slatted ball on a staff on a concrete base on the west side of the island. **Belle Bay**, the bight eastward of Hattie Island, does not afford anchorage.

Car Point is on the eastern shore about 3 miles northwestward of Belle Bay. About midway between is **Landslip Point**, just southward of which are three conspicuous landslides.

Chart 8054.—Breezy Point, about 5 miles northward of Camp Point on the western shore, is conspicuous. **Bluff Point**, on the eastern shore, 2.5 miles northward of Car Point, terminates in a high, bold cliff.

Tombstone Bay, on the west side of Portland Canal about 7.5 miles above Hattie Island, affords a temporary anchorage for small craft in 8 fathoms near the head of the bight at either end. There is a native village on the shore of the southern bight.

Maple Bay, on the east (British Columbia) side of Portland Canal, 8 miles above Hattie Island, affords fair anchorage for small craft, 300 yards from the southern side, in 7 to 8 fathoms.

Turn Point, about 9.5 miles above Hattie Island, is 0.5 mile wide. The northern end is marked by a daybeacon.

Green Islets, two small, wooded islets on the eastern side, about 21.5 miles above Hattie Island, are connected with the shore by a short spit which bares.

Fords Cove, on the eastern shore just northward of Green Islets, is a bight in the shore affording fair shelter from southerly winds but none from northerly winds. A rocky ledge, which partly bares, extends northward from Green Islets for about 75 yards. The southern part of the cove is shoal for about 175 yards offshore. A fair anchorage with sufficient swinging room may be found in 16 fathoms, 0.2 mile from Green Islets and the same distance from the eastern shore. Small craft can anchor closer inshore.

Cliff Point, on the western shore, about 3.3 miles above Green Islets, is marked by a light, 36 feet above the water and shown from a small white house. **Verdure Point**, about 4.5 miles northward of Cliff Point, is conspicuous by the maple trees, when in bloom.

Lion Point, on the east shore about 3 miles below the head of the canal, is low and wooded, and has a grassy flat in front. The bight in the shore just southward of Lion Point is filled by a flat, which bares. The **Marmot River** flows through a valley which trends to the eastward.

There is a government landing float at **Marmot Bay**, 0.5 mile northeastward of Lion Point, with a depth of 18 feet alongside at the southern end and 9 feet at the northern end.

The Bear and Salmon Rivers at the head of Portland Canal are separated by the bare **Reverdy Mountains** range.

Salmon River empties on the western shore about 1.5 miles below Bear River. Extensive flats make out in a fan shape from the mouth of Salmon River, the northern portion of which extends about halfway across the canal; these flats are covered at high water and are steep-to. **Stewart Light (55°54.7′ N., 129°59.5′ W.)**, 16 feet above the water, is shown from a frame wooden slatted pyramid on the foreshore eastward of **Eagle Point**, the northern entrance point of Salmon River.

Bear River flows through an extensive wooded flat at the head of Portland Canal. The channels are subject to change during freshets. The flats at the mouth uncover for 800 yards and are steep-to; it is reported that they are slowly extending.

Hyder (P.O.), on the Alaskan side of the boundary, is a town occupying the flats off the mouth of the Salmon River and extending up the valley. There is only a small wharf with 4 feet at its face. It is reported to be unsafe. There is no fresh water on the wharf. A road along the shore connects with Stewart. There is also communication by small craft with Ketchikan; radio and telegraph facilities are available. Most of the town is practically deserted.

Stewart (P.O.) is a settlement on the British Columbia side at the head of the canal. The government wharf is

on the western side of the canal about 0.5 mile above Hyder. It has berthing space of 250 feet and a freight shed. There are depths of 14 feet alongside its outer end and 10 feet on the landward side. A light and fog signal are at the wharf. The other wharves are in ruins. There are several floats for small craft. Stewart is a port of entry. Telegraph, radio, and air communication is available. Regular passenger and freight steamship service is maintained with Vancouver and Prince Rupert. There is a hospital.

Anchorage can be had in 25 to 30 fathoms near the head of the canal, 0.2 mile from the east side, 0.3 mile below Bear River Flat, and with Eagle Point, the north point at the entrance to Salmon River, bearing 246°. Vessels should not go above the latter bearing, as the flat is uncovered only at low water and is very steep-to. The holding ground is good, soft mud, but the anchorage is unprotected, being exposed to northerly and southerly winds that draw through the canal.

Currents.—In the narrowest part of Pearse Canal the current has a maximum velocity of 3 to 5 knots. Elsewhere the estimated maximum velocity is 2 knots on the flood and 3 knots on the ebb, diminishing toward the head of Portland Canal. For daily predictions of places in Portland Canal, see the Tidal Currents Tables.

Chart 8102.—Revillagigedo Channel and **Tongass Narrows** are connecting bodies of water which have a combined length of about 53 miles from their junction with Dixon Entrance at Tree Point Light to their junction with Clarence Strait at Guard Islands Light. On their southern side they connect with Clarence Strait through Felice Strait and Nichols Passage. **Revillagigedo Island,** which is separated from the mainland by Behm Canal, forms the greater part of the northern shore of the passages.

Revillagigedo Channel extends in a general northwesterly direction from Dixon Entrance for a distance of 40 miles to Tongass Narrows (Chart 8094), the latter being a continuation of the channel, for a distance of 13 miles to Guard Islands. The dangers are shown on the charts. From its entrance to Bold Island, Revillagigedo Channel is broad and comparatively free of dangers; the rocks lying nearest the tracks of vessels show out of water and are readily distinguishable. Above Bold Island, the channel is narrow in places, but the principal dangers are marked by bouys or lights so that in clear weather no difficulty should be experienced in passing through.

Tides and currents.—The mean range of tide in Revillagigedo Channel is about 13 feet and the diurnal range is about 15 feet. Eastward of Duke Island the average velocity of the tidal current at strength of flood or ebb is about 0.5 knot. A set across the channel is sometimes experienced in the vicinity of Twin Islands. Observations taken in midchannel between Bold Island and Reef Point indicate that the current at that location sets northwestward most of the time with a velocity varying from 0 to 1 knot. The current in the channel is usually too weak to be predicted.

The tidal current in Tongass Narrows is weak. There is evidence of a weak northwesterly nontidal drift. Currents of any appreciable velocity are due to winds. For further information on currents in the Narrows, the Tidal Current Tables should be consulted.

Chart 8075.—Boat Harbor, about 2.5 miles northwest of Cape Fox, is a small cove forming a poor shelter for boats. It is badly exposed to southwestward. There are two small wooded islets at the entrance and the best passage for small boats is between these islets. There is a rock which bares 5 feet near the middle of the north entrance.

Tree Point Light (54°48.2′ N., 130°55.9′ W.), 86 feet above the water, is shown from a 66-foot white square tower on a building on Tree Point 3.7 miles northwestward of Cape Fox.

Tree Point is low and timbered. The shore is rocky and steep-to. From Cape Fox to Tree Point, the shoreline is very irregular and is studded with many wooded islets and bare rocks. Because of the irregular bottom and inshore dangers this section of the coast should be given a berth of not less than 0.5 mile. The small bight at Tree Point is used by the Coast Guard tenders in landing supplies in smooth weather, but affords no shelter from southerly seas. **Humpy Point** is 1 mile northward of Tree Point.

Foggy Point, about 7.5 miles northward of Tree Point, is a low, rocky, wooded peninsula.

From Tree Point to Foggy Point the coast is clear of dangers except close inshore. A rock awash is about 0.6 mile northwestward of Foggy Point. Other kelp-marked rocks are southeastward of this rock.

Local magnetic disturbance.—Extreme magnetic disturbances exist southeastward of Duke Island. The magnetic compass should not be relied upon within the area outlined in magenta on the charts.

De Long Islands are a group of several low, wooded islets lying between 2 and 3 miles northwestward of Foggy Point. Between them and the mainland the bottom is exceedingly foul. Foul ground extends 0.7 miles southeastward of these islands.

Kirk Point, about 4.5 miles north-northwestward of Foggy Point, is a low, wooded peninsula. A kelp-marked reef, bare at low water, is about 550 yards westward of the point. Heavy tide rips have been experienced during a southwest blow in the vicinity of Kirk Point.

Foggy Bay is a wide indentation in the shore between Foggy Point and Kirk Point. It is nearly divided into two parts by the De Long Islands and the foul ground extending inshore from them. The northwestern part of the bay is foul and seldom used.

The southern part of the bay is used considerably by fishing boats and, in its southeast and eastern ends, affords safe anchorage for small craft. Large vessels can obtain temporary shelter from southerly storms in the southeastern part of the bay but the water is deep and the bottom lumpy. Great caution must be exercised in entering in order to clear the dangers which extend 0.6 mile northward from Foggy Point, and also to give sufficient clearance to the sunken rocks and reefs which ex-

tend 0.6 mile southward from the De Long Islands. As practically all of the dangers are covered at high tide, it is recommended that this bay be entered at low tide when the reefs are visible. Fresh water may be obtained from a pipeline at the head of the bight at the southeast corner of the bay.

Excellent anchorage for small craft can be had in the eastern head of Foggy Bay behind a large wooded island close to shore, about 1 mile southward of the entrance to Very Inlet. The northern entrance should be used since the southern opening bares at half tide.

Very Inlet, a narrow arm extending in a northeasterly direction, has its entrance on the eastern side of Foggy Bay 2 miles northward of Foggy Point. About 1.5 miles within the entrance a branch extends in a southeasterly direction. This branch is very narrow for about 1 mile and then expands into a basin in which there is considerable foul ground and a number of small islets. The ebb current flows over the rapids in the narrowest part of the branch for about 2 hours after low water. The passage has been made by a small vessel drawing 8 feet, but it should only be attempted at high-water slack. In entering, pass eastward of the ledge just within the opening.

At the head of Very Inlet is a small basin much used by fishing boats. A branch, which can only be entered safely at high-water slack, extends in a southeasterly direction from the head of Very Inlet. The entrance is very narrow and, in the narrows, bares at low water.

The entrance to Very Inlet is between a reef awash at high water and a low wooded island. It is usually discernible during the ebb by a strong current running out of the inlet. Favor the island shore in entering and keep in midchannel as far as the entrance to the first arm. Then pass midway between a large, wooded, round islet and a small, grass-covered one, westward of it. Just before entering the narrows, pass westward of all islets, favoring the main shore slightly, then keep in midchannel. Tide rips have been experienced about 0.5 mile southwestward from the entrance to Very Inlet.

House Rock, a small bare rock, is 0.3 mile 330° from Kirk Point.

Black Rock Light (55°01.4′ N., 131°03.5′ W.), 55 feet above the water shown from a white cylindrical house on a pyramidal skeleton tower on the highest part of the rock, 26 feet high, which is surrounded by kelp.

Snail Rock, grass-topped, is about 0.6 mile north-northeastward of Black Rock.

Between Black and Snail Rocks are numerous rocks, sunken and awash, and the area should be avoided. A kelp patch having a least depth of 1½ fathoms is 0.5 mile 106° from Snail Rock.

White Reef is an extensive white, shell-covered reef, mostly covered at high water, which lies between 2 and 3 miles north-northeastward of Black Rock in the entrance to Boca de Quadra.

Kah Shakes Cove, a bight about 1.5 miles southeastward of the entrance to Boca de Quadra, is a good anchorage for small craft. A rocky shoal with 1 fathom over it, lies 175 yards from the easterly shore eastward of the center of the cove. Care must be exercised in entering the bight leading to Kah Shakes Cove. There are a number of islets and rocks on the southern side of the entrance. Local knowledge is essential for entering the cove. There is about 12 feet through the entrance channel between the rocky islets. There is excellent holding ground in sticky mud and there are mooring piles in the cove.

Bull Head Cove, about 0.5 mile northward of Kah Shakes Cove, affords anchorage. Local knowledge is essential for entering. There is good holding ground in sand and mud; mooring piles have been driven in the cove. The inner portion is nearly all bare and is used principally for storing floating salmon traps.

Fair protection for vessels too large to enter either Kah Shakes Cove or Bull Head Cove may be secured in the bight between the coves. The outer portion of this bight is rough in heavy southerly weather so that vessels should anchor as near the head as their drafts permit. The bottom is sandy.

Kah Shakes Point, on the south side of the entrance to Boca de Quadra, is the termination of a low, broad, wooded peninsula extending northeastward for about 1.5 miles, whence the ground rises abruptly to the western point of a distinctive ridge running parallel to Boca de Quadra. The ridge has five distinct small peaks when viewed from the southward along the coast; from other directions it shows from one to four tops. The highest point on the ridge is **South Quadra Mountain.**

Ray Anchorage, a bight in the northeast side of Duke Island, affords shelter from southerly winds, but the bottom is hard and the anchorage is open northward. Anchor about midway between the rocky islet in the entrance to Morse Cove and the point about 0.6 mile eastward, with the islet bearing 277° in 10 to 15 fathoms, rocky and hard sandy bottom. There is deeper water nearer the islet.

Morse Cove has its entrance at the southwest end of Ray Anchorage. It is a landlocked harbor with varying depths and mud bottom. The entrance is very narrow and has a rock which bares 10 feet in the narrowest part, on the southeast side of midchannel. The channel on the northwest side of the rock is about 75 feet wide. Small craft with local knowledge can enter, preferably at low water. The entrance channel from Ray Anchorage is on the southeast side of the rocky islet in its entrance. Rocks which bare, are between the islet and the western shore.

Reef Harbor is the indentation between **Duck Islands,** the reefs on the east, and the shore of Duke Island, southward of **Grave Point,** the northern extremity of the island. It has depths of 23 to 25 fathoms, rock and sand bottom, but the swinging room is scant for the scope of chain required by this depth. Small craft may secure some protection from southerly weather by anchoring as close as size permits in the lee of **Flag Point.** Very small craft may use the wide portion of the passage between the two largest of the Duck Island group, but this anchorage is not secure in southerly weather.

Little Rock and **Whale Rock** are the extremities of a chain of rocks about 1 mile in length which lie 2 miles northeastward of Grave Point. **Bird Island,** about 1.5

miles west-northwestward of Whale Rock, is about 20 feet high and bare.

Cat, Fripo, and **Lane Islands** are low, and densely wooded. All of the islands are surrounded by ledges extending from 100 to 200 yards offshore. Small craft sometimes anchor off the middle of the west side of Cat Island, but there is little shelter.

Danger Passage, between Cat and Mary Islands, has a least width of about 350 yards between the 3-fathom curves and is suitable only for small craft.

Mary Island Light (55°06.0′ N., 131°10.8′ W.), 76 feet above the water, is shown from a 61-foot white square tower on a white building on the northeastern side of **Mary Island,** which is comparatively low, and densely wooded near the shores. A fog signal and radiobeacon are at the light.

Mary Island Anchorage is a bight in the north end of Mary Island between **Point Winslow** and **Giant Point.** It is a contracted anchorage with fair shelter from southeast and southwest winds, but more room and better protection can be had in Custom House Cove (see Felice Strait). Ledges covered with kelp extend about 150 yards northward of Point Winslow and Giant Point, and the entire south side of the anchorage is shoal for 150 yards beyond the projection of the shore. The approach is clear. Anchor in 12 to 15 fathoms, hard sandy bottom.

Twin Islands, 1.8 miles northwestward of Mary Island, are low and wooded, with deep water close-to in all directions, except a rock with 4 feet over it which lies 250 yards northwestward of the northwest island.

Boca de Quadra, has its entrance on the east side of Revillagigedo Channel between Kah Shakes Point and **Quadra Point,** about 6 miles eastward of Mary Island Light. It extends northeastward to the flat which extends 0.8 mile from its head. The sides are steep-to and densely wooded, and there are no outlying dangers.

Tides and currents.—The mean range of tide in Boca de Quadra is 12.7 feet and the diurnal range is 15 feet. Tidal currents have an estimated maximum velocity of about 1.5 knots at the entrance to Boca de Quadra, diminishing toward the head.

The preferred entrance is between Slate Islands and White Reef, following midchannel courses, passing on either side of Kite Island, but preferably northward of it.

Orca Point is on the eastern side of the inlet about 6 miles from the entrance.

Weasel Cove indents the northern shore about 7 miles from Kah Shakes Point, and affords anchorage in 17 to 19 fathoms about 0.5 mile above the eastern point at the entrance. The entrance and anchorage are clear, but vessels must keep clear of the flat which extends 700 yards from its head.

Badger Bay, separated from Weasel Cove by a promontory, has 25 to 30 fathoms throughout its length, and there is a small flat at its head.

Kestrel Island, a small rocky islet close to the eastern shore, is about 1.5 miles southeastward of Orca Point. **Kite Island,** low and wooded, is in the middle of the inlet about 2.5 miles southeastward of Orca Point.

Vixen Bay, having its entrance south of Kite Island, affords anchorage at its head about 2 miles from its entrance. In entering, the main channel is west of **Gannet Island. Raven Island** is close to the east shore, 1.3 miles from Gannet Island. Southward of and near Raven Island are rocks, visible and sunken at various stages of the tide.

The anchorage is between the rocks off Raven Island and Gosling Island, which is at the head of the bay. A ledge extends 175 yards northwestward from the north end of Gosling Island. Local knowledge is essential in anchoring near the head of the bay.

Chart 8053.—Mink Bay enters the south side of Boca de Quadra about 2 miles eastward of Kite Island, and has depths of 75 to 30 fathoms until near its head. **Cygnet Island,** low and wooded, is on the western side of the entrance. The narrow passage on the western side of the island is frequently used by small craft. **Grouse Rock,** which bares, is 0.2 mile southeastward of Cygnet Island; deep water surrounds the rock. On the western side of Mink Bay anchorage may be found between Grouse Rock and Cygnet Island in 5¾ to 7 fathoms, off the old cannery site.

Humpback Creek enters from eastward about 0.5 mile from the head of Mink Bay and carries a flat halfway across the channel. Above the flat is a secure anchorage, 0.3 mile wide, in 10 to 15 fathoms. A flat extends 700 yards from the head of the bay. Local knowledge is necessary to use this anchorage.

Hugh Smith Lake empties through **Sockeye Creek** (Chart 8102) into the inlet about 0.5 mile northward of the entrance to Mink Bay. A trail leads from the inlet along Sockeye Creek to Hugh Smith Lake.

Marten Arm has its entrance about 1.5 miles northward of the entrance to Mink Bay. It has depths of 70 to 100 fathoms until near the flat which extends 0.7 mile from the head. The arm is clear but has no anchorage. Above **Bactrian Point** the main northeast arm of Boca de Quadra is too deep for anchorage.

Chart 8075.—Slate Islands, on the northwest side of the entrance to Boca de Quadra, are a group of four low, wooded islands with numerous intervening rocks. The three northwestern islands are nearly connected at low water. **Slate Islands Light (55°05.3′ N., 131°03.1′ W.),** 33 feet above the water, is shown from a small white house on the south end of the southernmost island of the group.

From Slate Islands the coast extends northward for about 6 miles to Point Sykes. The shore is fringed by a number of islets and rocks. A cove about 1.2 miles southward of Point Sykes offers some protection to small craft in moderate weather, but is not sufficiently sheltered for use in heavy weather. The best anchorage is in the lee of the point on the south side of the cove in 8 to 10 fathoms, rock and sand bottom.

Lucky Cove is a small indentation in the southwestern shore of Revillagigedo Island midway between Point Alava and Cone Island.

Hog Rocks are the easternmost of a chain of islands,

rocks, and reefs which extend nearly 4 miles in an easterly direction from the shore of Annette Island. There are two principal groups of rocks about 1 mile apart, showing about 6 feet at high water, the easternmost of which is marked by a light 23 feet above the water and shown from a white square truncated pyramid. A ledge with 14 feet near its end extends 0.3 mile eastward from the light. There is good water between the two groups of rocks, and between the inner group and **Walker Island.** Small craft can pass between Walker Island and **Lewis Island,** or between Lewis Island and Ham Island, by avoiding the rocks shown on the chart.

Ham Island, about 5.5 miles northwestward of the north end of Mary Island, is low, and densely wooded. There is a deep channel along the entire northeastern side of the island at an average distance from shore of 225 yards.

Cascade Inlet is a deep and narrow body of water lying between Ham and Annette Islands. A narrow, crooked boat passage connects the inlet at its head with Revillagigedo Channel; small craft can find fair anchorage in midchannel in the broadest part of this passage close to the west end of Ham Island.

Hassler Harbor is a bight on the north side of Annette Island, lying southward of Bold Island. It affords excellent shelter with good holding ground for small craft in southeasterly gales. A small grass-topped rock, 10 feet high, 0.2 mile westward of **Pow Island** which lies in the bight. The safest anchorage is 300 yards from this rock, with it and the middle of Pow Island in range. Small craft, with care, can go to the inner anchorage southward of Pow Island.

Bold Island, about 5.5 miles northwestward of the light on Hog Rocks, is in midchannel off the northeastern shore of Annette Island, between **Reef Point** and **Harbor Point.** It is wooded, and has several knolls somewhat above the general level of the island. The south shore of Bold Island is steep-to and there are no off-lying rocks. Shelter for small craft may be found in the cove on the northeast side of the island, offshore from the abandoned buildings of a fox farm.

Angle Point Light (55°14.3′ N., 131°25.4′ W.), 24 feet above the water, is shown from a 10-foot small red house on the southwestern side of Bold Island. A fog signal is at the light.

The passage northward of Bold Island is seldom used by large vessels. **Mastic Rock,** which bares 2 feet and marked by a daybeacon, is near the eastern end of this passage.

Round Island, about 150 feet high and wooded, is about 0.5 mile northeastward of the eastern end of Bold Island, with two wooded islets between.

Thorne Arm has its entrance eastward of Bold Island and westward of Cone Island. Its general direction is north-northeast, curving gradually to north. The northern part of the arm is shown on chart 8102. The arm is free from outlying dangers. **Cone Island,** dome-shaped, is off **Cone Point.** A rock, with 2¾ fathoms over it and surrounded by much deeper water, is 0.5 mile southwestward of Cone Island. There are a number of small wooded islands off the western shore of Thorne Arm near the head. At the head of Thorne Arm in the cove eastward of **Mop Point** is a somewhat constricted anchorage in 18 to 20 fathoms, hard bottom. Anchorage can also be selected in the bight on the west side at the head between **Snipe Island** and Mop Point in 25 to 30 fathoms, soft bottom. Small craft may find shelter in the small cove northwest of Snipe Island, between it and the adjoining small island. A midchannel course leads safely through the arm and to the anchorages. **Sealevel Mine** is an abandoned mine on the east side at the head of Thorne Arm.

Moth Bay is a narrow indentation on the western side of Thorne Arm just inside the entrance. In the middle of the entrance to the bay is a small wooded islet and 300 yards above it is a rock. The channel leads on either side of the islet and eastward of the rock. Small craft with local knowledge can find anchorage about 0.8 mile above the rock.

Coho Cove, about 1.2 miles westward of Moth Bay and opposite the east end of Bold Island, affords fair anchorage for small craft, although the depths are great. The best channel for entering is on the east side of the islet in the entrance.

Spire Island is small, wooded, and about 150 feet high; there is a small islet to the eastward close-to. A light, 30 feet above the water is shown from a white square truncated pyramid on the north end of Spire Island reef. The reef covers several feet at high water.

Charts 8075, 8102.—Carroll Inlet, has its entrance about 2 miles northwestward of Bold Island between Mountain Point and **Carroll Point.** California Head separates it from George Inlet.

Mountain Point Light (55°17.6′ N., 131°32.8′ W.), 29 feet above the water, is shown from a red steel tower on the southwestern tangent of Mountain Point.

Mountain Point (pop. 372) is an unincorporated settlement on the point. **Herring Cove** (pop. 126) is an unincorporated settlement on the shores of Herring Bay, which indents the western shore of Carroll Inlet about 2 miles north of Mountain Point.

Cutter Rocks, two in number, close together and uncovering 11 feet, are on the west side of the entrance to Carroll Inlet about 0.6 mile 110° from Mountain Point; they are marked by a daybeacon. There is a clear passage between Cutter Rocks and Mountain Point.

California Cove, eastward of California Head, is a small open bight exposed to the southeastward. The cove is deep except along the western shore. Two small wooded islets and a rock awash are close to the western shore.

Chart 8102.—Gnat Cove is on the east side of Carroll Inlet about 6.5 miles above California Head and abreast **Hume Island.** A fair anchorage can be had in the middle of the entrance to the cove in 17 to 18 fathoms, soft bottom. Foul ground extends 250 yards from the south point at the entrance to the cove. Small craft can stand into the cove for about 0.4 mile and find a contracted anchorage near its head in 7 to 8 fathoms, hard bottom.

In the main inlet between Gnat Cove and **Island Point,** a distance of 4 miles, there are depths of 17 to 65 fathoms, and anchorage in suitable depth can be selected with the aid of the chart. At its head the inlet narrows to 0.2 mile, with depths of 27 to 36 fathoms, shoaling abruptly to the flat which extends nearly 1 mile from the head.

A midchannel course carries safely to the flat at the head of the inlet, and also into Gnat Cove. The only place requiring more than usual caution is at a point about 2.5 miles above Gnat Cove, abreast of **Shoal Cove,** where there is a wooded islet 95 feet high in the middle of the inlet, with a spur extending 300 yards from its northeast side, and a flat extending 0.2 mile toward the islet from the mouth of a stream on the eastern side, eastward of the islet. There is a clear channel on the south and west sides of the islet.

George Inlet, joining Carroll Inlet from westward at California Head, has deep water throughout. A cannery is on the west side of George Inlet, about 3.5 miles above California Head. The cannery wharf has a length of 160 feet and a least depth alongside of 32 feet. Either a port or starboard landing can be made. The ebb current runs fair with the face of the wharf; the flood current sets off the wharf due to the creek which empties close-to, southward of the wharf. At times the flow from the creek is very strong. Fresh water can be obtained on the wharf. The oil wharf has a 50-foot face with a depth of 20 feet alongside.

Mahoney Bight, on the western shore of the inlet, 6 miles north of California Head, is excellent shelter for small craft. Its entrance is narrow but clear of dangers, with 10 fathoms leading into the inner bight which has depths from 5 to 20 fathoms, soft bottom. The state maintains a mooring float in the bight.

Midchannel courses lead safely through the inlet passing westward of Coon Island and Bull Island, two wooded islands lying off the eastern shore of the inlet. **Coon Island** is identified by a large white quartz outcrop showing on its southern shoreline.

Coon Cove, in the eastern shore of the inlet opposite the southern end of Coon Island, offers good anchorage in 7 fathoms, gravel bottom and the best shelter in the inlet in southeast weather. It is entered on a midchannel course passing south of Coon Island.

Leask Cove is a fair anchorage near the head of the inlet westward of **Bat Point** in 18 to 20 fathoms, hard bottom. A rock with 2 feet over it has been reported about 75 yards west of Bat Point in the entrance to the cove.

Tsa Cove affords anchorage northeastward of **Bull Island,** but is not recommended except with local knowledge. The entrance is between Bull Island on the east and south and Bat Point and **Granite Island** on the west and north. The entrance channel between Bull and Granite Islands is obstructed by a long, narrow ledge in the mouth of the cove in the north end of Bull Island and which nearly closes the channel, and by another ledge in midchannel northward of the northeast end of Bull Island. In passing these ledges, Granite Island must be kept close aboard and caution is needed.

Small boats with local knowledge pass into **Salt Lagoon** at the head of the inlet, but only at or near high water slack.

Chart 8094.—Tongass Narrows is a continuation of Revillagigedo Channel and extends in a northwesterly direction to Guard Islands in Clarence Strait. The principal dangers are marked by buoys or lights, so that in clear weather no difficulty should be experienced in passing through.

The narrows is divided at its lower end by Pennock Island, the channel to northeastward of the island being called **East Channel** locally, and the channel to the southwestward of the island **West Channel.** Both channels are good for vessels of any draft. Large vessels approaching Ketchikan from southward usually pass through West Channel, since this gives them more turning room in making a port landing at the wharves. A buoy marks the edge of a shoal making out from the southwest side of West Channel.

For Federal Regulations governing navigation in Tongass Narrows; see § **207.785,** Chapter 2.

Chart 8095.—Potter Rock, nearly 0.7 mile east-southeastward of the east end of Pennock Island is small in extent, has 2½ fathoms over it, and is marked by a lighted bell buoy on its northeast side.

Pennock Island is generally wooded. Several rocky patches are 250 to 400 yards from shore around the southeast end of the island. Otherwise the south shore of the island is steep-to, and the channel is clear if the island side is favored in the narrowest part of the channel. A light is shown from a small white house on the west side of the island.

Radenbough Cove is on the east side of Pennock Island directly across the channel from Thomas Basin. Marine storage with grids and sheds is available for the purpose of storing and repairing cannery equipment with flat bottoms.

Whiskey Cove is on the east side of Pennock Island directly opposite the Coast Guard station. There is a machine shop where minor repairs can be obtained.

Pennock Reef, 600 yards westward of the west end of Pennock Island, is of small extent and bare at low water. A buoy marks its western side. Another ledge extends 200 yards westward from the northwestern extremity of Pennock Island.

California Rock is nearly in midchannel in the passage northeastward of Pennock Island and 0.5 mile from its southeastern end. The rock is small in extent, has 1½ fathoms over it, and is marked by a lighted buoy. There is a channel on either side of the rock, but large vessels usually pass on the north side between it and Idaho Rock.

Idaho Rock is 250 yards northward of California Rock near the north side of the passage. It has 2 fathoms over it and is marked by a lighted buoy.

Saxman (pop. 153) is a small native settlement in the bight northward of Idaho Rock and 2 miles eastward of Ketchikan. On the point 0.4 mile westward of the settlement are the ruins of a sawmill.

Ketchikan (55°20.5′ N., 131°38.7′ W., pop. 6,483; P.O.) is one of the most important cities in Alaska. It is the distributing point and center of the commercial and fishing industries of this part of southeastern Alaska. Ketchikan has oil stations, sawmills, canneries, and cold-storage plants.

Ketchikan is located on the southwestern side of Revillagigedo Island and on the eastern side of Tongass Narrows. It is 659 miles from Seattle via the Inside Passage; 79 miles from the sea at Dixon Entrance via Nichols Passage; 89 miles from Wrangell, and 220 miles from Juneau.

The deepest draft of commercial vessels calling at Ketchikan in 1959, was 31 feet. Commodities handled at the port included petroleum and petroleum products, fish and fish products, logs and lumber products, wood pulp, chemicals, provisions, and general cargo.

The most prominent features are the buildings of the canneries along the waterfront, the flagpoles on the Administration Building at the Coast Guard base and the New England Fish Company, the spires of the church at Saxman and the Lutheran Church in Ketchikan, and the conical-shaped cupola of the Stedman Hotel.

A Federal project provides for two small-boat basins, one at Ketchikan Creek with a project depth of 10 feet; and one off Bar Point with a project depth of 15 feet.

Thomas Basin, the small-boat harbor off Ketchikan Creek, has an entrance 75 feet wide marked by two lights on pile dolphins and is protected by a breakwater 940 feet long. A buoy marks a shoal at the end of the breakwater. Publicly-owned floats are maintained for the accommodation of small craft. The controlling depth in the basin was 10 feet in 1960. The U.S. Fish and Wildlife Service maintains a dock for their vessels in the north end of the basin behind their building.

Bar Point Basin, the small-craft harbor off **Bar Point,** is protected by two stone breakwaters, the ends of which are marked by lights. In 1959 depths inside the basin were 15 feet or more. A flat that mostly bares at low water extends along the northeastern shore for about a mile west of Bar Point.

Anchorages.—Anchorage off Ketchikan is limited by the cable area which extends northwestward through Tongass Narrows. Scan the chart carefully for limits of cable areas before attempting to anchor. The anchorage is secure for all but the heaviest winter gales; the confined channel admits no sea, and the tidal currents do not exceed 1.5 to 2 knots.

Tides and Currents.—The mean range of tide at Ketchikan is 13 feet and the diurnal range 15.4 feet. Daily predictions are given in the Tide Tables. There is usually a direct current or eddy setting westward along the face of the wharves. For this reason all large vessels make a port landing, those from the southward frequently using West Channel, which is marked by a light and buoys, and making the necessary turn around the west end of Pennock Island.

Pilotage.—Pilotage is not compulsory. Refer to Chapter 3 for information about pilotage in Alaska.

Towage.—There are no regular commercial towboats, salvage, or wrecking gear available in southeastern Alaska although arrangements can be made in Ketchikan to obtain this equipment from Seattle or by the employment of vessels ordinarily engaged in other types of work.

Quarantine.—The U.S. Public Health Service maintains an outpatient office at Ketchikan and makes quarantine inspections. Contract hospital space is available in a private hospital.

Customs.—Ketchikan is a port of entry and marine documents are issued.

Immigration.—The Immigration office is in the Federal building.

Harbor regulations.—Harbor regulations are administered by the Coast Guard officer designated as Captain of the Port. The Coast Guard maintains a repair base which is located at the southeast end of the waterfront. Navigation regulations are given in § **207.785,** Chapter 2.

Wharves.—There are approximately 2 miles of developed waterfront along which a number of wharves have been constructed for the accommodation of deep-sea vessels. These facilities are privately owned but are open to public use upon payment of wharfage charges. Several of the wharves have depths of 30 feet or more alongside. There are numerous floats for the accommodation of small craft. The city float, some 500 yards northwest of the steamer dock, has two main faces for outside moorage and several finger floats inside, which are used by many fishing and pleasure craft. Fresh water is piped to the float, and provisions and ship's supplies are available nearby.

Supplies.—Provisions of all kinds, ship chandlery, and coal in considerable quantity, can be obtained. Three oil companies maintain stations on the waterfront, and fuel oil, diesel oil, distillate, gasoline, and lubricating oil can be obtained. Fresh water can be obtained on most of the wharves.

Repairs.—There are machine shops where minor repairs to machinery can be made. All kinds of repairs to small craft and minor repairs to large ones can be made. Refer to Chapter 3 for information about marine railways in Alaska.

Communications.—Ketchikan has regular passenger, express, and freight service to Puget Sound, British Columbia, and Alaskan ports and towns by water and air. There is weekly mailboat service to the west coast of Prince of Wales Island and Metlakatla and less frequently to other points. As these schedules are subject to change, it is best to inquire at the Post Office for information on these trips. In addition to the scheduled air lines, other air services operate from Ketchikan on a charter basis.

A highway parallels the Revillagigedo shore of Tongass Narrows. It extends from the south side of Herring Bay to a point about one mile north of Knudson Cove in Clover Passage.

The Alaska Communication System maintains radiotelephone connections with the States and other parts of Alaska in addition to regular telegraph service.

East Clump, a wooded islet on the south shore nearly opposite Bar Point, is marked by a light on its eastern extremity. The light, shown from a small white house, is 15 feet above water. From East Clump to Lewis Reef, shoals extend 50 to 200 yards from the south shore, but the channel is well marked with buoys and daybeacons. A small-boat float is at the north end of Pennock Island.

A cannery on **Charcoal Point,** about 2 miles northwest of Ketchikan, has a wharf, marked by a light, that extends across the flats to deep water; the center of the channel in Tongass Narrows is only about 125 yards off. Fresh water is available from March 1 to October 1. It is reported that tidal currents form an eddy off Charcoal Point, tending to set vessels off the wharf; caution must be exercised in coming alongside as the strength of current is also unequal along the wharf face and may cause a vessel to swing at bow or stern. Vessels several times have struck the wharf.

A cannery wharf about 0.3 mile northwest of Charcoal Point is 70 feet long with a depth of about 24 feet alongside.

Chart 8094.—Lewis Reef extends from the south shore at **Lewis Point** nearly one-third the distance across the channel and is bare at half tide. **Lewis Reef Light (55°22.5′ N., 131°44.2′ W.),** 15 feet above the water, is shown from a small white house on a concrete pier on the southeastern edge of the reef.

Peninsula Point, the outer end of a neck of land built out from the north shore, has been hard-topped and serves as a seaplane ramp. A daybeacon and buoy are off the point.

Measured nautical mile.—A measured nautical mile bearing 135° extends along the Gravina Island shore opposite Ward Cove. The range markers are maintained by the Ketchikan Power Squadron.

Ward Cove is a good anchorage on the north side of Tongass Narrows, about 5 miles northwestward of Ketchikan. It is about 0.3 mile wide at the entrance and wider inside. The anchorage ground is somewhat obstructed by **Bolles Ledge,** with a least depth of 1 fathom, about 250 yards off the eastern shore. A long log boom extends from the northerly end of the pulp mill to the ledge. **East Island** is a wooded islet off the westerly side of the entrance. A midchannel course leads safely into the cove; the shores are steep, and there are no dangers other than those mentioned. Good anchorage can be had in midchannel northwestward of Bolles Ledge in 12 fathoms, sandy and muddy bottom. An anchorage farther out may be taken if desired in 15 to 20 fathoms, sandy bottom. The pulp mill, on the northwest side of the cove, maintains an extensive waterfront facility for handling its own products. The principal dock, more than 800 feet long, has least depths of 32 feet off the face.

A cannery is on the southeastern shore 0.7 mile from the head of the cove. The face of the main wharf is 150 feet long and has a least depth of 36 feet. A salmon byproduct plant is also on the eastern shore, 0.2 mile from the head of the cove. The face of the wharf is 85 feet long with a least depth of 20 feet.

Ward Cove (pop. 69; P.O.), is an unincorporated settlement on the new highway near the northwest corner of Ward Cove.

Westward of Ward Cove and near the north side of Tongass Narrows is a group of small islands, partially wooded, and rocks awash which are mostly surrounded by ledges. These small islands protect **Refuge Cove** from any swells which might be running in Tongass Narrows. The southern side of the cove is clear. **Refuge Cove** (pop. 142), an unincorporated settlement, is at the head of the cove.

Channel Island, nearly in midchannel, is wooded, and has a good passage on either side, but that on the south side is generally used. A ledge extends 75 yards northeastward from the island. A light 30 feet above the water is shown from a small white house on a square skeleton structure on the western end of the island. A fog signal is at the light.

Ohio Rock, with 3½ fathoms over it and marked by a lighted buoy, is 0.3 mile northwestward of Channel Island.

Mud Bay, on the northern side of the narrows about 1.5 miles northwestward of Ward Cove, is shallow, with bare flats extending 100 yards or more offshore. It is used as a winter storage place for fish traps.

A number of totem poles and a replica of an old Indian meeting house are on the eastern point of **Totem Bight,** the first bight northwestward of Mud Bay.

Rosa Reef makes off about 0.2 mile from Rock Point on the south shore 1.8 miles northwestward of Channel Island, and is covered at highest tides. A light 23 feet above the water is shown from a small white house on the east end of the reef. The bight southward of Rosa Reef forms an indifferent anchorage, but is seldom used. The eastern part of the bight is shoal for over 0.2 mile offshore.

Pond Reef is about 0.2 mile from the north shore near the west end of Tongass Narrows. It is bare at half tide, usually surrounded by kelp during the summer months, and is marked by a lighted buoy on the south side.

Vallenar Point, the northwesterly extremity of Gravina Island, is low and wooded, and rises in a long easy slope to the high land of the island. A rocky patch, marked by a buoy, is 700 yards northeastward of the point. Close northwestward of the point are two wooded islets, and westward of them are rocks awash at highest tides; there is no safe passage inside these rocks. The outer rock, **Vallenar Rock,** has deep water close to northwestward. Small boats with local knowledge often use the passage between Vallenar Point and the small islands close-to. It has a least found depth of 2½ fathoms in the middle of the passage. It is necessary to pass between the two shoals northeastward of Vallenar Point, which can usually be identified by being awash or by the surrounding kelp.

Guard Islands, two in number and close together, about 1.5 miles northwestward of Vallenar Point, guard the western entrance to Tongass Narrows. **Guard Islands Light (55°26.8′ N., 131°52.8′ W.),** 74 feet above the water, is shown from a 30-foot white square tower on a rectangular building on the north island of the group.

A fog signal and radiobeacon are at the light. Special radio direction finder calibration service is provided on request; for details see the light list.

About 0.3 mile southeastward of Guard Islands is a large kelp patch marking a reef, small portions of which are bare. There is a passage on either side of the reef, but the one 0.6 mile wide between it and Vallenar Rock, called **Inside Passage,** is preferred.

Point Higgins is on the north shore opposite Vallenar Point.

Charts 8075, 8078, 8079, 8102, 8124.—Behm Canal borders the eastern, northern, and western sides of Revillagigedo Island; its eastern entrance between **Point Sykes** and **Point Alava,** is about 5 miles northward of Mary Island Light. The western entrance of the canal between Point Higgins and Caamano Point, is about 1 mile northward of Guard Islands Light; the distance from the eastern entrance to the western entrance through Revillagigedo Channel and Tongass Narrows, is about 30 miles; the length of the canal from the entrance to entrance is about 100 miles. The main channel of the canal is exceptionally free from dangers; with no sunken rocks or ledges that cannot be easily avoided by a stranger in clear weather.

Currents.—The flood current enters Behm Canal at each end and meets somewhere in the vicinity of Burroughs Bay. In general the currents are not very strong, ordinarily from 1 to 2 knots. For daily predictions for places in Behm Canal, the Tidal Current Tables should be consulted. Tide rips generally occur on the ebb at the mouths of the various tributaries. During the ebb a strong westerly set is noticed in Behm Canal at the entrance to Naha Bay. In the early summer, milky colored water extends from Burroughs Bay to the western end of Gedney Island and up into Yes Bay. This is the result of the glacial silt carried down by the rivers emptying into Burroughs Bay.

The cove eastward of **Roe Point,** on the eastern shore, is a fair anchorage for small craft in 5 to 10 fathoms, soft bottom, offshore from an abandoned cannery site.

Chart 8075.—Alava Bay, on the western shore of Behm Canal, about 2.8 miles from Point Alava, is partly open to southerly weather. Depths in the main part of the western bight are 26 to 28 fathoms but fair shelter for small vessels can be found close inshore in 6 to 10 fathoms, soft bottom. Some swell but very little wind comes into the head of this arm. The entrance to the western bight is constricted by a 1½-fathom shoal in midchannel. The shoal is marked by thick kelp. The eastern bight is clear but too deep to afford anchorage.

Narrow Pass is westward of **Rudyerd Island,** on the west side of Behm Canal 8 miles above Point Alava. The northeast and southwest shores of Rudyerd Island are very foul and should be given a wide berth. Small craft can find some shelter from southeast blows in the two narrow bights at the north end of the island. Such craft have tied to the steep west shore of the westerly bight. The head of the west bight is shallow and rocky; in 1957 an anchored 50-foot cruiser grounded on a falling tide 100 yards from the south shore.

Chart 8078.—Smeaton Bay enters Behm Canal from eastward 10 miles above Point Sykes and eastward of the southern end of Smeaton Island. The water in the bay is too deep for anchorage, but on the south side at the entrance, between **Carp Island** and **Short Point,** a vessel can lie in summer in 19 fathoms, hard bottom, protected from the summer winds. Small vessels may find shelter close-to in 5 to 10 fathoms. Seven miles from the entrance the bay divides into **Wilson Arm** and **Bakewell Arm.**

Princess Bay, to the westward of **Smeaton Island,** is open and exposed to the southward. Deep water extends close to the shores, and depths in the bay are too great for anchorage. In **Short Pass,** between **Wasp Point** and Smeaton Island there is a depth of 11 fathoms.

Small craft can find anchorage in the small bight in the western shore about 1 mile northward of **Sharp Point,** in 15 to 20 fathoms, hard bottom. This anchorage affords good protection from south and southeasterly winds. Anchorage for small craft can be had in the bight to westward of Sharp Point, depths ranging from 5 to 20 fathoms, hard bottom. In entering favor the western shore. Very small craft can find a land-locked anchorage in the bight on the western shore, about 1.5 miles southwestward of Sharp Point in 2 fathoms, soft bottom. This bight and the entrance is foul. Enter only on a rising tide with local knowledge using extreme caution.

Wasp Cove is on the western shore of Behm Canal, about 3 miles northward of Smeaton Island. It affords anchorage for small craft in 5 to 7 fathoms, soft bottom, free from obstructions.

Shoalwater Pass is a narrow body of water which separates **Winstanley Island** from the mainland. The pass is divided into two separate anchorages, the northerly one being the better of the two, with depths of 5 to 20 fathoms, mud bottom. The southerly anchorage has a depth of about 30 fathoms, mud bottom. Small craft can pass through the narrows between the anchorages at high water. **Candle Island** is on the western side of the southern entrance to the pass. A sunken rock with 3 feet over it is near the middle of the southern entrance about 0.9 mile northward of Candle Island. The bar at the northern entrance has a depth of 9 feet and should not be crossed at low water except by small craft.

Entrance Island, which is fairly bold, may be passed on either hand in approaching the northern entrance to Shoalwater Pass. Pass in midchannel between the high-water islet at the north end of Winstanley Island and **Slag Point**; then favor the mainland shore and proceed with caution until up with the wooded island on the Winstanley side of the channel. Leave this island to the westward and select an anchorage south of it.

Checats Cove, on the eastern side of Behm Canal southward of **Edith Point** affords anchorage for small vessels, protected from southerly winds, in about 8 to 10 fathoms, mud bottom, about 100 to 200 yards northward of **Checats**

Point, the southern entrance point. Strangers should select an anchorage at low water, as the flats extend for some distance and are then plainly visible.

New Eddystone Rock (55°30.2′ N., 130°56.2′ W.), 20 miles above Point Sykes, is a remarkable shaft of rock 234 feet high, rising from a sand shoal in the middle of the canal, with deep water surrounding it. It may be passed on either hand, keeping it at a distance of 0.5 mile to avoid the sand shoal. At the eastern extremity of the shoal is a small pinnacle rock which uncovers about 4 feet.

New Eddystone Islands are a group of islets and rocks, some of which cover; they extend for about 1.2 miles offshore northeastward of New Eddystone Rock. Small craft with local knowledge pass among these islands, but strangers should keep to westward of them.

Ella Creek empties into the small bight behind **Ella Point** on the western shore of Behm Canal.

Rudyerd Bay enters Behm Canal from eastward between **Point Eva** and **Point Louise**, about 23 miles above Point Sykes. The bay and approaches are free from dangers.

Two arms enter the bay from southward; the lower, named **Punchbowl Cove** on account of its precipitous sides, is 2 miles, and the upper about 7 miles, from the entrance. Temporary anchorage may be found close to the southern shore near the head of Punchbowl Cove in 25 fathoms.

Near the head of the upper arm and opposite a prominent landslide is an anchorage in 20 fathoms, hard bottom. Small craft can find temporary anchorage near the edge of the flats at the head of the bay and the head of the upper arm. Temporary anchorage may be had about 0.5 mile eastward of Point Louise and about 400 yards northward of a small, but prominent landslide, in 18 to 20 fathoms, hard bottom. The bottom is very irregular.

Sargent Bay, on the western shore of Behm Canal opposite Rudyerd Bay, is open and exposed to southward. Depths throughout the bay are too great for anchorage. **Cactus Point** is the northeastern point and **Tramp Point**, the southern point at the entrance. A small boat passage is on the western side of the group of islands lying northwestward of Tramp Point. The passage is clear, but the islands should be favored to clear the foul ground along the western shore.

The channel on the western side of **Manzanita Island** is clear, with a controlling depth of only 6 feet. This channel is used to a large extent by small fishing vessels. Midchannel courses are good.

Manzanita Bay, on the western side of Behm Canal, westward of **Wart Point**, affords good anchorage in 20 to 23 fathoms, soft bottom. The head of the bay is filled with a flat which bares, and several rocks which bare lie along the edge of the flat. The anchorage is in the southeastern bight of the bay. In entering, favor the eastern shore to avoid the rocks and flat previously mentioned. The Forest Service maintains a float in the small bight which lies on the west side of Wart Point. Depths at the outer end of the float are reported to be 8 fathoms. The Forest Service also maintains a mooring dolphin off the mouth of **Grace Creek**, 4.7 miles northward of Wart Point.

Snip Islands are off the western shore of Behm Canal, 1.2 miles northward of Grace Creek. Good anchorage for small craft can be had in the passage westward of the islands in about 15 fathoms, sandy bottom. The entrance is from northward. The southern entrance is obstructed by a bar which bares.

Walker Cove enters Behm Canal from eastward about 10 miles above Rudyerd Bay entrance and abreast Snip Islands. The cove has great depths throughout except at the entrance. The shores of Walker Cove are very abrupt and in some places almost perpendicular. A summer anchorage can be made in midchannel on the inside of the bar at the entrance between **Hut Point** and **Ledge Point** in 10 to 20 fathoms. The bar has depths of 6½ to 10 fathoms. Rocks and ledges off the entrance points are the only dangers in the cove.

Channel Islands are two wooded islands about 0.6 mile off the eastern shore of Behm Canal, about midway between Walker Cove and Chickamin River. The islands may be passed on either side, but care should be taken to avoid the reef, awash at high water, which extends about 0.2 mile southward of the islands.

Chickamin River enters Behm Canal from eastward, between **Fish** and **Trap Points**, about 5 miles above the entrance to Walker Cove. Large flats occupy nearly the whole of the bay at the mouth of the river and extend almost to the two points at the entrance from Behm Canal. Small craft can find temporary anchorage near the edge of the flat.

Portage Cove on the west side of the canal bares. Depths of 3 to 8 fathoms can be found at the entrance, but these drop off quickly to deep water.

Saks Cove is on the northeast shore of Behm Canal 10 miles above the mouth of Chickamin River. The cove affords anchorage near its north end; there are no dangers, except the small flat at the northeast corner of the cove and a reef that uncovers 4 feet about 75 yards southeastward of **Fire Point**, the western point at the entrance.

Fitzgibbon Cove is on the northeastern shore of Behm Canal, about 1.5 miles southeastward of the entrance to Burroughs Bay. The entrance between **Dew Point** and **Hose Point** is clear. **Center Islets**, wooded, are near midchannel, 0.4 mile inside the entrance. **Gibbs Rock**, bare and 15 feet high, is on the eastern side of the cove, 0.4 mile above Center Islets. A sunken rock with 7 feet over it is 110 yards 300° from Gibbs Rock. The cove affords good anchorage about 0.2 mile above Gibbs Rock in 11 to 13 fathoms, mud bottom.

Burroughs Bay enters Behm Canal from the northeastward; it is clear. **Unuk River** enters the head of the bay from northward and **Klahini River** from northeastward; Unuk River is said to be navigable a considerable distance for skiffs. The head of the bay and the mouths of both rivers are filled with flats. There is no secure anchorage; temporary anchorage for moderate-sized craft can be selected on the east side just southward of the flat of the Klahini River in about 30 fathoms. Small craft

can anchor near the edges of the flats. The depths at the head of the bay are gradually shoaling. The Forest Service maintains a mooring dolphin here.

Burroughs Bay Light (56°03.0′ N., 131°08.1′ W.), 18 feet above the water, is shown from a small white house on the north shore at the entrance of Unuk River.

Chart 8079.—Anchor Pass is a narrow strait about 6 miles westward of the entrance to Burroughs Bay, which separates the northeastern end of Bell Island from the mainland. There is good anchorage in the pass for small craft in the small cove just south of the restricted northern entrance in 3 to 5 fathoms, soft bottom. The northern entrance to Anchor Pass is shallow and rocky. The least depth over the shoalest reef, located in the middle of the pass at its northern end, is 1½ feet.

The estimated tidal current has a velocity of 2 to 3 knots at the northern end of the pass and flows northward from about 2 hours after low water until 2 hours before the next low water. From 2 hours before to 2 hours after low water the current flows southward with a velocity of about 1 knot.

Behm Narrows separates **Bell Island** from Revillagigedo Island. The shores of the narrows are generally steep and heavily wooded. Anchorage can be had in the bight 0.5 mile southeastward of Bell Island Hot Springs in 20 fathoms, mud bottom. Care should be taken to avoid the rock and ledge at the western part of this bight.

Bell Island Hot Springs is a small health resort, with a store, at the head of the cove at the southwest end of Bell Island. The float landing for small craft, maintained by the Forest Service off the end of the Bell Island Hot Springs wharf, has a depth of 42 feet at the outer end. There is a ramp for seaplanes. No fresh water is available. A light 35 feet above the water is shown from a small white house on the north shore back of the landing.

Bell Arm, which separates the northwestern shore of Bell Island from the mainland, extends northeastward from Behm Canal and at its head is joined by Anchor Pass; it has good anchorage in the expansion at its head in 16 fathoms, soft bottom. A light, 32 feet above the water is shown from a small white house on **Snipe Point.** It marks the entrance of Bell Arm and Behm Narrows. **Short Bay** and **Bailey Bay** are two small, narrow bays entering the side of northwestern Bell Arm. Short Bay, the eastern one, has good anchorage in 17 to 20 fathoms; a flat extends 300 yards from its head. Inland from Bailey Bay is an area of hot springs.

Hassler Pass and **Gedney Pass,** both broad and clear, are on the east side of Behm Canal and separate Hassler Island from Revillagigedo Island. At the head of Gedney Pass is **Shrimp Bay,** and at the head of the latter in **Klu Bay,** is a good anchorage in 16 fathoms, soft bottom, suitable for vessels of moderate size.

Dress Point is a broad point on the eastern side of the southern entrance to Hassler Pass. A snug anchorage for small craft in depths of 5 to 17 fathoms is in the cove, 1.5 miles northward of Dress Point on the eastern side of Hassler Pass.

Blind Pass, between **Black Island** and **Hassler Island,** is useless except as a small craft anchorage in the basin at the southwestern end of the pass. On account of rocks in this entrance local knowledge is necessary in entering the basin. The pass is closed by a sand bar just northeastward of the basin. The bar uncovers 3 feet and is studded with small boulders up to a foot in diameter. Northeastward of the bar the water is deep, ranging from 10 to 50 fathoms.

Convenient Cove, in the southwestern end of Hassler Island between it and Gedney Island, is too deep for anchorage. The narrow passage eastward of the cove leading to Gedney Pass is clear except for some rocks on the northern shore and a ledge extending in a northerly direction from the easternmost islet.

Yes Bay enters Behm Canal from the northwestward between **Bluff** and **Syble Points.** A light 23 feet above the water is shown from a small white house on Bluff Point on the southwestern side of the entrance to Yes Bay. The entrance is free from dangers.

The ruins of a cannery are about 2.5 miles above the entrance on the northern point of the narrow passage leading to the first basin. Caution must be exercised in navigating in this area, particularly in the vicinity of the site of the wharf which stood 300 yards northeastward of the cannery. Broken piles are visible here at low water. Anchorage can be had about 0.3 mile southeastward of the cannery site in 22 fathoms, mud bottom.

A narrow channel leads southwestward of the cannery site to the first basin where good anchorage can be had in 15 to 30 fathoms, mud bottom. A good small boat anchorage in 3 fathoms is near the southeast end of the first basin. At the head of the first basin is a group of islands, eastward of which is a channel leading to the inner basin, where good anchorage can be had in 11 to 12 fathoms, mud bottom.

Care is required in navigating Yes Bay and strangers should do so at low water. Enter in midchannel and then favor the northern shore. In entering the first basin, pass about 35 yards southward of the cannery site and keep the north shore close aboard until the basin opens up. If going to the inner basin, keep about 100 yards off the north shore until up to the group of islands which separate the two basins. Here the channel narrows to about 75 yards on account of a sunken rock with 3 feet over it, and a rock awash at low water, both of which are on the western side of the channel. In passing through this channel, keep the northeastern shore aboard at a distance of about 30 yards. The inner basin is clear.

Spacious Bay is a broad bay in the west shore of Behm Canal about 22 miles above Caamano Point. **Square Island** is in the entrance near the southern shore; the channel southward of the island is not recommended. Near its head the bottom is irregular and there is a considerable area of tidal flats with off-lying reefs and sunken rocks. Good anchorage can be selected in the lee of Square Island,

sand and mud bottom. A dangerous sunken rock has been reported about 0.4 mile northwest of the island. The bights in the northern shore of the bay are not recommended for anchorage.

Snail Point is readily identified by the distinct knoll, about 0.5 mile southward of the point. On the western side of the point is a bight 0.5 mile in length which affords good anchorage for small craft. A sunken rock with ¾ fathom over it is in the middle of the bay and small craft should favor the eastern shore until clear of this rock and proceed to the head of the bay for anchorage.

Neets Bay indents the eastern shore of Behm Canal about 19 miles above Caamano Point. The bay has no good anchorage. Small craft, however, can find fair shelter in the last cove toward the head on the south side of the bay. Pass eastward of the small wooded islet and anchor east or south of it in 3 to 5 fathoms, sand bottom. The bottom is very irregular in the bay and there are several dangers, one of them being a sunken rock with ¼ fathom over it, 300 yards southwestward from the western end of **Bug Island**, which is in the middle of the entrance to the bay. Enter Neets Bay either north or south of Bug Island but south of **Clam Island.** A shoal extends from Clam Island almost to the north shore of the bay.

Bushy Point is a prominent projection on the eastern side of Behm Canal about 2 miles below Neets Bay. It is readily recognized from north and south by a series of dome-shaped hills immediately inshore from the point.

Bushy Point Cove is a small bay inside of Bushy Point. It is too deep for anchorage except for small craft which anchor close to the beach at the head of the bay.

Heckman Point, on the western shore of Behm Canal opposite Bushy Point, is prominent and readily identified by some reddish brown rocks. On the western side of the point is a small bight which is used as a temporary anchorage for small craft.

Traitors Cove indents the eastern shore of Behm Canal about 15 miles above Caamano Point. An island is in the middle of the entrance. Ledges extend from this island in both southerly and northerly directions, the center of the channels on both sides being clear. About 300 yards 275° from the northern point at the entrance is a reef which uncovers 6 feet, and which presents a real danger to craft leaving or entering the cove by the northern entrance.

The cove should be avoided by strangers because the strong tidal currents and rocks make navigation dangerous. The upper part of the cove can be entered only by small craft at slack water, which is very short in duration; on the flood small craft should keep away from the narrow entrance to the upper cove as there is danger of being swept through by the force of the current. There is very little time of slack water on spring tides, the current changing in direction very suddenly. The only anchorage is in the bight in the south shore of the cove about 2 miles above the entrance. Rocks are on both sides of the bight near its entrance, and a depth of 10 feet is found in midchannel at the entrance.

Port Stewart is an indentation in the western side of Behm Canal, 12.5 miles northward of Caamano Point. Its southern entrance is marked by **Point Francis (55°40.2′ N., 131°49.0′ W.)**, a prominent wooded point. The northern entrance point is not well defined, being low, flat country for a mile from the beach. Four wooded islets are across the mouth of the bay. There is a clear channel between the easternmost and southernmost islets, but there are some off-lying rocks to avoid. The best entrance is northward of the two islets. The passage between the southernmost wooded islets and the main shore is narrow, but clear, with a least depth of 5 fathoms.

Anchorage can be had in 16 fathoms, rock and mud bottom, 350 yards 315° from the northwestern point of the westernmost wooded islet. Small craft with local knowledge can find sheltered anchorage in 7 fathoms, mud bottom, in the land-locked bight in the northern shore of Port Stewart, about 3.5 miles above Point Francis.

The small bight on the eastern shore of Behm Canal, about 0.5 mile northward of **Escape Point** is too deep for anchorage, although in good weather small craft anchor in the southern end of this bight near Escape Point.

Wadding and **Raymond Coves** are indentations in the western shore of Behm Canal, opposite Naha Bay. They are useless as anchorages, and at low water there are extensive tidal flats of sand and gravel with some boulders.

Mike Point is a low, rocky point separating Wadding and Raymond Coves. The point is foul and should be given a good berth. The beach here is strewn with bleached logs and other drift, and this is also true, to a lesser extent, of all the shore northward to Point Francis.

Helm Bay indents the western shore of Behm Canal about 5.5 miles above Caamano Point. The north entrance point is marked by **Trunk Island, off Helm Point,** a small, prominent island slightly wooded. The south entrance point is marked by **Helm Bay Light (55°34.8′ N., 131°55.6′ W.)**, 18 feet above the water, shown from a small white house on the outermost islet on the southwestern side of the entrance.

Behind **Forss Island,** on the western shore, 3.3 miles in from the light, is a small cove at the head of which is a float with safe depths alongside for small craft. It is maintained by the State. Enter it from the north, passing between two charted off-lying rocks.

There are some dangers, but midchannel courses carry safely to the head of the bay. The channel leads between **Thomas Island** on the north and two wooded islands joined by a reef to southward. Pass in midchannel northward of Forss Island and another wooded island beyond, above which the bay is comparatively clear. There is about half a mile of tidal flats at the head of the bay which drops suddenly into deep water.

Anchorage is available in midchannel in 16 fathoms, mud bottom, about 1.2 miles above Forss Island, and in 21 fathoms, gravel and mud bottom, about 2 miles above the island. The latter is the better anchorage of the two.

Smuggler Cove is on the western side of Behm Canal, about 5 miles northward of Caamano Point. It is a fair anchorage for small craft, although local knowledge is necessary to clear the dangers. The extensive tide flats at the head of this bay are used for laying up floating fish traps.

Chart 8124.—Indian Point marks the northern entrance to Naha Bay. The country northward of the point is heavily wooded. The shore is rocky and generally steep-to.

Naha Bay, on the eastern side of Behm Canal, is about 11.5 miles northeastward of Caamano Point. **Loring** is a village on the north side near the head of the bay. **Cache Island,** round and wooded, lies near the middle of Naha Bay and has deep water on all sides.

The usual anchorage is just below the ruins of an old wharf about 300 yards from the shore of the village, in 19 fathoms, mud bottom. The shore in front of the village should not be approached closer than 100 yards. Small craft can find anchorage in the small bay northward of **Dogfish Island** where shelter is had from any southwesterly squalls which occasionally strike home with considerable force. The bight eastward of the village is practically dry at low water. Naha Bay and its approaches are clear. The Forest Service maintains a small float suitable for small craft at the north side of the head of the bay. The float is about 60 feet in length, parallel with the beach, and has a reported depth of 12 feet at its outer face.

Roosevelt Lagoon is a body of brackish water which is connected to Naha Bay only at extreme high water. The passage is dangerous and should not be used without local knowledge. Small barges at one time made this passage. A tramway leads from the head of the lagoon to the first lake northeastward of the lagoon.

Moser Bay, an indentation in Revillagigedo Island, is separated from Naha Bay by **Cedar, Moser,** and **Stack Islands.** Good anchorage for small craft is found in 7 fathoms in the small bight in the northwestern part of the bay; for larger craft in 20 fathoms at the head of the bay. On the eastern side of the bay are two private homes with floats. At the head of the bay is a tidal flat about 0.5 mile long which is made use of by canneries in laying up their floating traps. A reef makes off southeastward of **Cod Point,** the western point at the entrance to **Long Arm.**

Grant Island, heavily wooded, is on the eastern side of Behm Canal about 8 miles northeastward of Guard Islands Light. A light, 17 feet above the water, is shown from a small white house on the west side of the island.

Chart 8079.—Clover Passage, a deep passage on the west side of Revillagigedo Island is frequently used by vessels proceeding between Naha and Moser Bays, and Tongass Narrows. There are several entrances to it from the north in deep narrow channels between Cedar and Moser Islands, Stack and Grant Islands, and a deep, wider entrance between Back and Grant Islands.

Back Island, low and heavily wooded, is about a mile westward of the south end of Grant Island. A reef extends about 0.2 mile off the northwestern end of the island and broken ground extends 0.3 mile east of the island. The channel between Back Island and Betton Island to the southwestward is foul with reefs of sunken and rocks awash.

Hump Island is on the east side of Betton Island. A daybeacon is on the southeastern end of the island.

Betton Island is on the east side of the southwestern entrance to Behm Canal. **Betton Head**, on the west side of the island, is a dominating feature of the locality.

Joe Island is in midchannel near the northern entrance with deep channels on each side.

The Pup is an island off the southern extremity of Betton Island at the southwestern entrance to Clover Passage. A narrow channel less than 100 yards wide with a depth of 5 fathoms is between the two islands.

Clover Island is in midchannel in the southwestern entrance to Clover Passage. There are deep channels on each side of the island. **Clover Passage Entrance Light (55°28.7′ N., 131°48.7′ W.)**, 14 feet above the water is shown from a small white house on an islet about 0.4 mile southwestward of Clover Island. A ledge with rocks awash extend about 0.2 mile northeastward of the light.

Knudson Cove is a small bight on the southeastern side of Clover Passage, about 0.7 mile eastward of Survey Point. Small craft use it as an anchorage. There is 4 fathoms at the outer end. A daybeacon marks the west side of the entrance and a light 14 feet above the water is shown from a structure on the end of the dock at the south end of the cove. A daybeacon, about 20 yards 90° from the light marks a rock awash at half tide. The state maintains a float in the cove. The anchorage is subject to strong williwaws. **Clover Pass** (pop. 169) is an unincorporated settlement on Knudson Cove.

Survey Point is at the southern end of Clover Passage.

Tatoosh Islands, westward of Betton Island, are a group of islands northward of which are numerous off-lying rocks known as **Tatoosh Rocks.** The southernmost island has deep water close to the western shore and a yellow cliff 130 feet high on this island makes a good landmark. The northwesternmost rock of Tatoosh Rocks is 14 feet high and has an off-lying reef which bares 10 feet, 140 yards northwestward. The rocks are light-colored and show well in clear weather.

The passage between the southernmost Tatoosh Island and Betton Island is clear, but the northern end of the passage is rocky, and local knowledge is necessary to navigate this area. Small craft use these waters for anchorage but there is some danger from williwaws.

Bond Bay and the smaller indentations between Bond Bay and Caamano Point Light are used as temporary anchorages by the smaller fishing craft during the trolling season. These anchorages are exposed to southeastward and are not recommended due to the suddenness and

great force with which the southeast winds strike home in this area.

Caamano Point Light (55°29.9′ N., 131°58.9′ W.), 33 feet above the water, is shown from a small white house. **Caamano Point,** the western point at the western entrance to Behm Canal, is a long, low point; its extremity being somewhat indefinite when abeam, due to the Bond Bay shore lying in the background and also from the fact that the light is not located on the actual point, but 0.4 mile westward.

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5. CLARENCE STRAIT, DIXON ENTRANCE TO WRANGELL

Charts 8102, 8201.—Clarence Strait extends in a northerly direction from Dixon Entrance for 45 miles to Guard Islands and the western entrance to Tongass Narrows and Behm Canal, and thence in a northwesterly direction for 67 miles to Sumner Strait. From its south entrance to Zarembo Island, a distance of about 100 miles, the channel is broad and comparatively free from dangers. At Zarembo Island the strait divides. The channel eastward of the island, called Stikine Strait, is the route taken by vessels to Wrangell and Wrangell Narrows: that westward of the island, called Snow Passage, is used by vessels bound to Wrangell Narrows or westward through Sumner Strait as it is more direct.

Passage through Clarence Strait and subsidiary channels to Sumner Strait and Wrangell is described in the following order: western shore, Cape Chacon to Kasaan Bay; eastern shore, including Felice Strait and Nichols Passage, to Vallenar Point; Kasaan Bay and northward to Kashevarof Passage; Snow Passage, Ernest Sound and Zimovia Strait; Blake Channel and Eastern Passage; and Stikine Strait to Wrangell.

Currents.—The current velocity is 1 to 2 knots in Clarence Strait from the south entrance to the vicinity of Zarembo Island. The flood current sets northward through Clarence Strait, and the ebb in the opposite direction as far as Key Reef, following the general trend of the channel. At Nunez Rocks and Cape Chacon, the flood current sets northeastward around the cape and the ebb southwestward. Southward of the line of Cape Chacon the tidal currents are much confused.

In general, the currents in the strait set directly in and out during flood and ebb, except in the vicinity of the entrances to the estuaries, where a slight set across the channel may be experienced setting to or from them, especially the large ones; and along the shores of the strait where it is either slack or there is a small counter current. The most noticeable of these counter currents is at Dewey Anchorage and among the islands at Onslow Point, where it has considerable velocity, from 2 to 3 knots, and sets directly opposite in direction to the current in the strait. This counter current meets the main current at the entrance of the large bay east of Point Stanhope, and is confined to the bay and the immediate vicinity of the shore southeastward. For daily predictions for places in Clarence Strait, the Tidal Current Tables should be consulted.

Chart 8145.—Cape Chacon (54°41.5′ N., 132°00.9′ W.), has been described in Chapter 4.

From Cape Chacon to Stone Rock Bay, the shoreline is rocky and the bottom is irregular. During the fishing season numerous traps line this section of the coast. Temporary anchorage has been obtained about 0.5 mile offshore about 1.5 miles northward from the cape in depths of 18 to 20 fathoms. About 2.3 miles northward from the cape, and about 900 yards offshore from **Huaji Cliff,** is a 2-fathom shoal.

Stone Rock, gray-colored and bare, is 3.5 miles northward of Cape Chacon. Rocks awash and unmarked shoals are within 0.4 mile of Stone Rock.

Stone Rock Bay is about 4.5 miles northward from Cape Chacon, is an open bight with deep water and irregular bottom. Foul ground extends off the entrance points, and there is a 5¼-fathom shoal midway in the entrance. Small fishing craft anchor close to shore, but the use of the bay as an anchorage is not recommended.

Mallard Bay is about 5 miles northward from Cape Chacon. Foul ground extends about 0.6 mile offshore from the point separating Stone Rock Bay and Mallard Bay. A fish-buying scow is anchored near the head of the bay from May 1 to September 15. All fishermen supplies are obtainable. There is a mooring float for small craft. Fresh water can be obtained at the float.

Fair weather anchorage may be had near the head of the bay in 15 fathoms, sandy bottom, with about 0.1 mile swinging room. Favor the northern shore of the bay when entering. The channel between the shoals making out from the northern and southern shores is narrow.

McLean Arm is a narrow inlet about 6.5 miles above Cape Chacon. **McLean Point,** the southern entrance point, is marked by **McLean Point Light (54°47.5′ N., 131°57.3′ W.)**, 58 feet above the water and shown from a small white house. The point is low but at a short distance back rises to a dome-shaped hill. **Island Point,** the northern entrance point, is a wooded island close to the main shore. A bare rock, 22 feet high, is 100 yards southward of the point.

The head of the arm has two branches. The southern and larger branch affords anchorage in its widest part in 20 fathoms, sticky bottom, with swinging room for small vessels. A flat extends 0.2 mile from the head of this branch. Anchorage can be selected in about 17 fathoms at the entrance to the north branch, however it is less desirable, and care must be taken to avoid a ledge which bares, and which extends about 250 yards eastward from the point dividing the two branches. Large vessels can anchor at the head of the main arm in 28 to 30 fathoms, irregular rocky bottom. A midchannel course will lead safely to the anchorage. The williwaws come down from the adjacent mountains with considerable force. A small craft anchorage is close under the southern shore about 3.2 miles inside the entrance. Fresh water can be obtained from several streams.

Gardner Bay, about 8 miles northward from Cape Chacon, affords good anchorage, but its narrow entrance restricts its use to small vessels only. The northern entrance point is a bold, light-colored, rocky point, timbered on top. A breaker close to the point and one in

the bight westward of the point frequently show. A group of small wooded islands with rocks awash off the southeastern end is about 0.1 mile off the southern entrance point.

A group of islands choke the entrance to the inner bay. The channel northward of the islands is narrow and crooked; its use is not recommended. The channel southward is about 100 feet wide and has a least depth of 8 fathoms. About midway between the islands off the point and those in the entrance is a 1½-fathom spot marked by kelp. Fresh water may be obtained from several streams.

Fishing vessels and small craft frequently use the channel southward of the outer islands and rocks. Midchannel courses suffice. Caution should be exercised when entering as the dangers are unmarked. Anchorage in 13 fathoms, mud bottom, can be had in the basin at the head of the bay. The points at the entrance to the basin should be given a berth of about 150 yards.

Scows are moored in 6 to 8 fathoms in the small bight in the southerly shore about 0.5 mile from the narrow channel.

Kendrick Bay is about 10 miles above Cape Chacon. Except for a reef in the middle of the bay 2 miles inside the entrance, it is free of dangers until near its head.

Three arms lead southward and westward from Kendrick Bay. **South Arm** is clear, and near its head, affords good anchorage for small craft. **Short Arm** is clear until 0.2 mile from the head. **West Arm** is foul for a distance of 0.5 mile inside the entrance, and should be entered preferably at low water. Enter southward of the islets and proceed with caution. Good anchorage for small craft can be had near the head of the arm; however, during the colder winter months ice forms in this area and it cannot be used as anchorage.

Kendrick Islands, on the north side of the entrance to Kendrick Bay, are a group of about 20 islands varying in size, and for the most part wooded. Foul ground extends about 0.5 mile east of the main islands of the group. Small craft with local knowledge can enter Kendrick Bay from northward by passing northward of all the islands, between them and the main shore. Good anchorage and shelter for small craft can be found among the islands.

The north point of Kendrick Bay rises rather sharply to a flat-topped peak, forming a headland which shows prominently from points along the western side of the strait.

The shoreline from the north entrance point of Kendrick Bay to Hidden Bay, a distance of about 2.2 miles, is very broken. Rocks lie offshore from 0.2 to 0.3 mile.

Chart 8086.—An inlet, 0.6 mile long in a westerly direction and about 0.1 mile wide, lies about 1.2 miles above the north entrance point of Kendrick Bay. The channel is narrow and has general depths of 3 to 6 fathoms, except in the narrow part, where they range from 2 to 4 fathoms. A rock covered 3 fathoms 2 feet, lies 0.3 mile offshore in line with the southern shore of the inlet, while rocks, awash, lie 0.3 mile to the eastward of the north point of the entrance.

Hidden Bay indents the western shore of Clarence Strait about 15 miles northward of Cape Chacon. The entrance is less than 0.1 mile wide and lies to the northward of a group of rocky islets, the most northerly of the group in the entrance. A sunken rock covered 3 fathoms 2 feet and rocks awash are off the entrance. The largest island of the group, 200 feet high, lies to the southward. The south entrance point at the first narrows rises to a rounding hill 260 feet high. The north entrance point is low, with a little knob near the extremity. A depth of 1 fathom is in the entrance to the first narrows, and rocks lie close to its southern shore. Depths of 5 to 20 fathoms were obtained in the first cove. A rock lies 50 yards off the eastern entrance point of the second narrows. Depths in the second narrows range from 2 to 6 fathoms and ledges project from its southeastern shore. Depths in the inner cove range from 6 to 18 fathoms.

A stranger entering for the first time should select low-water slack when the reefs outside and the rocks in the entrance will be showing. The currents in the narrow part of the entrance are strong. Small craft may, with care, work their way to the entrance from the southward back of the islands. The bay is suitable for small craft only.

Scott Point, about 1 mile northward of Hidden Bay, is a round point with an abrupt shoreline characterized by large gray ledges. It rises rapidly to a peak.

Ingraham Bay is about 1.2 miles northwestward from Scott Point. Rocks, usually marked by kelp, extend about 200 yards off the entrance points. The entrance to Ingraham Bay is best approached from the eastward in midchannel, between the southern entrance point and the eastern end of the two groups of islands in the middle of the entrance. A depth of 20 fathoms can be carried to the head of the main bay and to an anchorage with sand and gravel bottom. The channel northward of the inner group of islands is very narrow and should not be used.

The bay has two arms and is about 3.5 miles long to the head of the southern arm. The northern arm starts about 0.8 mile within the entrance and is about 1.5 miles long.

To enter the north arm, pass southward of the two groups of rocky islets off its entrance. A narrow channel extends into the northern arm. A shoal with a depth of 3 fathoms 2 feet extends from the western shore to the middle of the channel.

The controlling depth in the narrows is 6 fathoms. Follow the trend of the channel leaving the small islet in the second narrows to the southward and anchor in 10 fathoms, mud and sand bottom, in the bight at the head of the arm. This arm is suitable for small craft only.

To enter the south arm, the small wooded islet, 200 yards northwestward of the long wooded tongue which marks the southeast point of the entrance to this arm, is left about 100 yards to the southward. The channel leads between this islet and the long reef, 200 yards to the westward, which parallels the shore.

The southern arm is characterized by numerous rocks

and reefs; the controlling depth in the entrance is 3 fathoms. With local knowledge 4 fathoms may be carried to the head where anchorage may be found for small craft in depths of 2 to 10 fathoms, with excellent holding ground in mud bottom. The chart should be the guide.

Ingraham Point, the northwest entrance point of Ingraham Bay, is low and wooded for a distance of 0.6 mile from the point where it commences a sharp rise to a wooded ridge. The shoreline to Polk Island, a distance of 1.2 miles, is rocky and foul.

Polk Island is about 1.3 miles northward of Ingraham Point. A reef, bare at half tide, lies midway in the channel between the island and the Prince of Wales Island shore. The north end of the channel is obstructed by rocks and islets. There is a controlling depth of 2 fathoms in the narrow crooked section at the northeast end. Small craft with local knowledge can work their way through.

A small rocky islet with a prominent tree lies close to the southeast end of Polk Island. From the northward or southward, for a distance of 2 miles, it is noticeable.

Chichagof Bay lies about 2.5 miles northward from Ingraham Point. It is about 0.3 mile in length and width, and has varying depths from 2 fathoms 5 feet in the entrance to 4 fathoms near the shore. A reef extends 0.1 mile in a northerly direction from the southern shore, 0.2 mile from the entrance point. A narrow inlet, with depths of 4 to 7 fathoms, extends 0.3 mile in a southerly direction from the southwest corner of the bay. A depth of 1 fathom is in the middle of the entrance to the inlet.

Rip Point, about 3 miles northward from Ingraham Point, is low for about 1 mile back from the shore, then rises steeply to a long ridge. There is a small wooded knob about 250 feet high in the center of the flat area and several hummocks with an elevation of 200 feet or less. Foul ground extends 0.3 mile southeastward from the point.

Sun Rocks, the two most prominent rocks in this area, about 100 yards long, 20 yards wide, and 15 feet high, lie about 0.2 mile southeastward from Rip Point. Tide rips extend 0.8 mile off Sun Rocks and Rip Point during a southeast wind and ebb tide.

A small cove lies 0.3 mile southwestward from Rip Point. Rocks lie on both sides of the entrance about 50 yards offshore. A rock lies about 50 yards off the middle of the northwest shore. Depths in the middle of the cove range from 9 to 21 fathoms; small craft anchorage in 5 to 6 fathoms, fine sand bottom, may be had in the arm which extends southward from the center of the cove.

Moira Sound indents the western shore of Clarence Strait, about 25 miles northward of Cape Chacon; it is 4.5 miles wide between Rip Point and Adams Point. **Adams Point,** the north entrance point, is low and wooded. Near the extremity is a knob about 350 feet high. Rocks extend about 0.2 mile off the eastern shore of the point. The general direction of the sound is southwesterly, and within the entrance it divides into three separate arms.

South Arm extends about 5 miles to the southward and has numerous reefs which uncover at low water. Favor the eastern shore in entering. The south end of the arm affords good all-weather anchorage in about 7 fathoms. **West Arm** has a length of 2.5 miles and then divides into two short arms, the northern, known as **Dickman Bay,** the southern as **Frederick Cove. Johnson Cove** has a length of about 2 miles and indents the south shore of the sound about 2 miles southward of **Black Point.** The chart is the guide.

Moira Rock Light (55°05.0′ N., 131°59.8′ W.), 40 feet above the water is shown from a small white house on the highest part of Moira Rock, the northernmost of a chain of islands, which stretch from Rip Point towards Adams Point. A rock with 6 fathoms over it is 1 mile east-northeastward of Moira Rock. **Moira Island,** 0.6 mile long and wooded, is about 0.9 mile to the southward of Moira Rock. The channel between Moira Rock and Adams Point has depths ranging from 35 to 170 fathoms.

A small islet is about 0.1 mile eastward of the north end of Moira Island. Kelp and rocks are in the channel between them. A group of rocks awash and marked by kelp, is midway between Moira Rock and Moira Island. Deep water surrounds these rocks; the channel between them and Moira Rock is clear.

Kegan Cove is 3 miles west of Black Point. The outer cove is fair anchorage in 8 to 12 fathoms, mud bottom. The inner cove has an entrance 50 yards wide and can be entered by boats drawing 8 feet, on the upper half of the tide. The west shoreline should be favored when entering. Excellent shelter and anchorage in 6 to 10 fathoms, mud bottom, can be had inside. A small mooring float, maintained by the Forest Service is anchored in the inner cove. **Kegan Creek,** outlet to **Kegan Lakes,** flows into the head of the cove. A marker on the east side of the stream indicates the end of a trail paralleling the creek to the shore of the first lake.

Whiterock Island, about 0.3 mile southeastward of Moira Island, is irregular in shape and wooded. **White Rock,** on the southeast side of Whiterock Island, is a large grayish-white, conical-shaped rock. Southward is a smaller rock with the same general features. The small cove on the northwest shore of Whiterock Island is foul. Midway between the southern ends of Moira and Whiterock Islands is a reef which uncovers 11 feet. A clear channel, about 250 yards wide, favoring Moira Island, is westward of this reef. The channel between Whiterock Island and the reef is foul. Foul ground extends off the northern and eastern shores of Whiterock Island for about 0.2 mile and off the southern shore for about 0.5 mile.

Menefee Anchorage, about 1 mile westward from Rip Point, is much used by fishing craft, but is not suitable for large vessels. Anchorage may be had in about 15 fathoms, mud and rock bottom, with 200 yards swinging room. By following the shoreline from Rip Point at a distance of 0.2 to 0.3 mile, a clear channel may be carried to the anchorage. **Menefee,** near the anchorage, is a summer camp of the Metlakatla Indians. The small cove, southward of the village, with depths of 25 fathoms in the center and shoal water near the eastern shore, is entered westward of the midchannel islet.

Menefee Islands, about 1.3 miles westward of Rip Point, are two large wooded islands. A narrow ledge and small rocky islets project about 250 yards from the north shore of the western and larger island. A group of three large islets and several smaller ones, covering an area about 0.9 mile long in a southwesterly direction, lies about 0.3 mile northwestward of the larger Menefee Island. Foul ground extends 300 yards southeastward of the northeast islands. The channel between these islands and the Menefee group is obstructed at the northeast end by a midchannel rock and at the southwest end by a rock in midchannel, awash at low water.

A bight lies about 1.5 miles to the westward of Menefee Anchorage. In the center of the bight is a rock, awash at high water. A bank with a least depth of 3 fathoms 1 foot lies about 0.2 mile westward from the rock. There are numerous rocks and islets along the southern shores. The small cove on the northeastern shore of the bight might furnish anchorage for small vessels in 10 fathoms.

Egg Islands are a group of wooded islands on the west side of the entrance to Moira Sound, about 2.8 miles southwestward of Moira Rock.

Niblack Anchorage entrance is about 3.3 miles 243° from Moira Rock on the west side of Moira Sound southward of the entrance to North Arm. The anchorage, in 6 to 12 fathoms, mud bottom, is secure. The entrance is narrow, in one place only 100 yards wide, but the harbor is easily entered by steamers. At the head of the harbor is the abandoned Niblack Mine. Several streams empty into the harbor.

Safety Rock is a grass-covered rock about 15 feet high, in the middle of the entrance and westward of the Egg Island group. A ledge which uncovers 5 feet is 0.2 mile southward from the south point of **Clare Island**. A rock covered 1 fathom 4 feet is 0.1 mile from the south shore and 0.5 mile from the head of Niblack Anchorage. The channel usually followed passes about 0.3 mile northwestward of Moira Rock, northwestward of Safety Rock and the ledge, and to the southward of the rock off Clare Island. The north side of the narrow entrance in range with Red Rock (and south shore) near the head of the harbor clears the ledge.

From Adams Point to **Point Halliday**, the northern point of the entrance to North Arm, the shoreline is broken and there are many rocks close to shore. A 5-foot spot is 0.4 mile 098° from Point Halliday. A shoal making southward from Point Halliday has a depth of 3 fathoms 3 feet about 0.25 mile off the point.

North Arm, about 5 miles long, and 0.3 mile wide at the entrance, is in the northwest side of Moira Sound about 2.5 miles westward of Moira Rock. There is a 3-fathom 5-foot spot in the center of the entrance about 0.3 mile south of Point Halliday. A secure anchorage can be found inside near the eastern shore, in the cove about 1 mile from the entrance directly south of the small cedar covered island, in 6 to 10 fathoms, mud bottom. There is a rock awash near the middle of the cove.

Deichman Island, 2 miles inside the entrance of North Arm, has foul ground between it and the shore eastward, and foul ground extends 0.2 mile southeastward and 300 yards southward from it. In passing beyond Deichman Island, the southern shore should be favored until past **Beck Rock**, which uncovers 12 feet. Then a midchannel course will pass 0.1 mile northeast of **Cannery Rock**, which covers at half tide.

At its head, North Arm divides into two fingers. The northerly finger, **Nowiskay Cove**, affords good small-craft anchorage in about 8 fathoms. The southerly finger extends to **Clarno Cove** and **Aiken Cove**. Craft entering this finger should favor the south shore, taking care to avoid the rock awash which is 240 yards southeastward of the small islet off the northerly point at the entrance. By passing about 50 yards off the southerly beach, a least depth of 10 fathoms can be carried into Clarno Cove, where good all-weather anchorage is available in about 12 fathoms, soft mud bottom.

The small unnamed bay south of Clarno Cove is entered by a narrow, crooked channel with a least depth of 1 fathom, between ledges extending out from both shores. The middle of this bay provides excellent anchorage in about 4 fathoms.

From Clarno Cove a narrow channel continues westward into Aiken Cove, which is shoal and mostly bare except for a small area near the mouth where an anchorage can be found in about 9 fathoms. Favor the northerly shore in entering from Clarno Cove.

Cannery Cove, just northwest of **Cannery Point,** affords good anchorage in 13 fathoms, and the small bight on the north side of the cove has small-craft anchorage in 1 fathom.

Port Johnson, a narrow deep inlet, extending about 3.5 miles in a westerly direction, is on the west side of Clarence Strait, between Adams Point and Wedge Islands. There is good anchorage in 15 fathoms about 2.4 miles above the entrance. Fresh water is available from a stream on the north shore about 0.2 mile below the head of the inlet. Anchorage in about 13 fathoms, but with limited swinging room, is at the head, and from this shore a trail through a divide leads to North Arm of Moira Sound.

Scraggy Point and **Inner Point,** at the entrance to Port Johnson, presents no characteristics of interest to the navigator.

Dolomi Bay is on the north side of Port Johnson, about 1.8 miles to the westward of Adams Point. It is a small arm at the head of which is the abandoned mining camp of **Dolomi.** A rock covered 5 feet is near the center of the small bay near the head of the inlet. Small craft may find anchorage in about 8 fathoms with limited swinging room. An abandoned tramway leads to the mines on the north shore of Paul Lake 2 miles northwestward from the abandoned town. The high mountain at the head of **Paul Lake** is a prominent landmark. The summit is grass-covered, the slopes are uniform, and it is not often clouded. From the entrance, midchannel courses hold good. The chart should be the guide

French Harbor and **Dutch Harbor** are locally known small-boat anchorages behind the islands northward of the entrance to Port Johnson. They do not furnish good anchorages and the approaches are rocky.

Wedge Islands are a group of low islands and rocks 2 miles northward of the entrance to Port Johnson. From the larger island, rocks, bare and awash, extend for about 0.6 mile to the southward and shoal and irregular bottom extends about 1 mile to the southwestward. A 2¼-fathom spot lies 1 mile to the southward of this island. Three rocks, bare at low water, lie 0.5 mile northwestward from the north end of the larger island. A sunken rock lies 0.2 mile northward from these rocks. A shoal with 7 fathoms on it lies 0.7 mile to the northward of the north end of large Wedge Island. A channel 0.4 mile wide, with a least found midchannel depth of 30 fathoms, lies about 0.6 mile westward of large Wedge Island; its direction is **030°**. This course lies within 0.2 mile of dangerous shoals on either side, and those without local knowledge should not attempt to use the channel.

Foul ground extends 0.3 to 0.5 mile offshore, to the point 4 miles northward of Port Johnson. From this point to Windy Point, a distance of 2 miles, foul ground extends 200 yards offshore.

Chart 8102.—Windy Point, low and wooded, lies between two small exposed coves with an island close-to on each side. The southern cove has midchannel depths of 6 to 9 fathoms but is foul to the westward of the small island near the north shore. The northern cove has midchannel depths of 9 to 14 fathoms but is foul toward the head. Rocks extend off the point for about 240 yards.

From Scraggy Point, the north entrance point to Port Johnson, to Chasina Point, which is the point about 4.5 miles northward from Windy Point, the land is thickly wooded and slopes gently for about 0.2 mile from the shore and then rises quickly to a ridge. Two small exposed coves are midway between Windy Point and Chasina Point. Midchannel depths in the southeast cove range from 9 to 11 fathoms, shoaling to 4 fathoms near the head. The northwest cove has depths in the middle of 9 to 13 fathoms; the western bight has depths of 3 to 5 fathoms; the southern bight is foul.

Currents in the vicinity of Wedge Islands to Skin Island are stronger on the flood and at spring tides reach an estimated velocity of 2 knots. Moderate tide rips are set up with the wind against the current northward of Wedge Island in the vicinity of Windy Point. For daily predictions, the Tidal Current Tables should be consulted.

Cholmondeley Sound is a deep inlet entering Prince of Wales Island between Chasina Point and Skin Island. Its extreme length is about 16 miles; it has several arms, all of which are deep and bold with heavily wooded mountain slopes ending with steep-to rock shorelines. The sound and its tributaries have not been closely surveyed but are generally free from dangers. The currents in the sound are too weak or variable to be predicted.

Chasina Point, about 36 miles northward of Cape Chacon and the south point of the entrance to Cholmondeley Sound, is a wooded rounded point without any prominent features. The land is low for a distance of about 0.8 mile and then rises rapidly. It is advisable to give the point a berth of at least 0.3 mile in rounding it.

Chart 8074.—Chasina Island is a low wooded islet about 0.8 mile westward from Chasina Point, about 0.1 mile offshore. The passage behind the island is foul. A 1¾-fathom spot is midway between Chasina Point and Chasina Island and about 250 yards offshore.

Chasina Anchorage, to the westward of Chasina Island, affords a lee only from easterly to southerly winds. Anchorage may be obtained on a rocky patch in 10 fathoms with the northwest corner of Chasina Island bearing about 042° and Skin Island Light bearing about 338°; swinging room is about 250 yards. Anchorage in 17 fathoms, with the light on the same bearing, may be obtained farther offshore.

Chart 8102.—Skin Island, 0.8 mile off the northwest point of the entrance to Cholmondeley Sound, is wooded, and about 170 feet high on the southeast side. A reef that uncovers 12 feet is about 450 yards to the southwestward of the island. A group of small islets is between the reef and Skin Island. A rock, awash at low water, is about 0.1 mile off the point on the western side of the island. **Skin Island Light (55°18.2′ N., 132°04.4′ W.),** 33 feet above the water, is shown from a small white house on the northeast point of the island.

The channel between Skin Island and Prince of Wales Island shore to the westward is navigable, but the bottom is very irregular. The northwest entrance point of Cholmondeley Sound, the point to the southward of Skin Island, and a 3¾-fathom spot, about 0.5 mile westward of Skin Island, are on the range. A course about 250 yards eastward of this range carries clear of known dangers, but the channel is not recommended. The bight southeastward of Anderson Point, the southerly entrance point of Clover Bay, is foul.

Hump Island in the entrance to Cholmondeley Sound, about 4 miles southward of Skin Island, is timbered, about 400 feet high, and presents a conical appearance.

Lancaster Cove, about 1 mile southeastward of Hump Island, is the northern one of two coves lying eastward of an island on the eastern side of Cholmondeley Sound. It affords good anchorage in 13 to 14 fathoms. It can be entered on either side of the wooded island in its entrance. A rock which uncovers 12 feet lies 0.1 mile northward of the northwest end of the island, and a rock with a least depth of 3½ fathoms lies 175 yards northeastward of the southeast end of the island. In 1959 a survey vessel used an anchorage about 150 yards south of the wooded island, in 12 to 20 fathoms, mud bottom, good holding ground. There were no dangers in the anchorage or approach.

Kitkun Bay has its entrance west of **Babe Islands,** about 6 miles southwestward of Chasina Point and extends in a general southwesterly direction from the southern side of Cholmondeley Sound. The area was surveyed in 1959. Entrance to the northern part of the bay should be made through the westerly of two channels. The least depth in midchannel is 3¼ fathoms. Entrance to the southern part of the bay can be made through a narrow channel about half way down the eastern shore of

the northern part of the bay. This channel is foul at the entrance; the foul area is marked by kelp. Currents in the channel and near the entrance are very strong, with tide rips near the entrance. The least depth in the narrowest part of the channel is 2 fathoms.

Dora Bay, on the south side, about 8 miles inside the entrance to Cholmondeley Sound, may be used as an anchorage, but is not recommended. There is an irregular ridge across its entrance, with a least depth of 7 fathoms. The anchorage at the head of the bay is in 25 to 35 fathoms.

Sunny Cove lies on the north side at the head of the main part of Cholmondeley Sound, 9 miles westward of Chasina Anchorage, and, with local knowledge affords anchorage for small craft. **Sunny Point** is the rounding point on the northern side of the entrance to the cove.

The head of Cholmondeley Sound is divided into two arms known as **South Arm** and **West Arm.** West Arm has a straight unbroken north shoreline. Its southern shore has two indentations, the first just above the confluence of the two arms is small but furnishes shelter for small craft with anchor depths of 4 to 8 fathoms. The second indentation in the south shore is southwest of the most easterly of the chain of small wooded islets. Anchorage with ample swinging room may be had here behind the islet toward the head of the small bay in 7 to 15 fathoms, soft bottom. Enter directly toward the head of the small bay from the main channel course, keeping the islet to the southward. Anchorage may also be had in 7 to 15 fathoms, soft bottom, at the head of the bay. This anchorage is exposed to strong winds drawing through the low pass from Hetta Inlet.

From the head of West Arm a portage trail leads about 3.5 miles to the head of Hetta Inlet.

South Arm is free of known dangers except for one reported sunken rock about midchannel and 1 mile inside its entrance. This rock was struck by a vessel but is not definitely located. It is charted as position doubtful. Vessels entering South Arm can favor either shore in the vicinity of the rock but otherwise steer midchannel courses to the head of the arm to anchorage in 6 to 10 fathoms, soft bottom. Strong winds from Klakas Inlet draw through the low pass at the head of South Arm.

All tributaries of Cholmondeley Sound freeze in their upper reaches during the winter.

To enter Cholmondeley Sound steer a midchannel course to the head of West Arm, passing to the north of the chain of wooded islets.

Clover Bay has its entrance between Clover Point and **Anderson Point,** the southern entrance point, about 1.5 miles westward of Skin Island. A rock lies about 170 yards north-northwestward of Anderson Point and a 6¾-fathom spot lies in midchannel in the entrance. Foul ground extends about 0.2 mile eastward from Anderson Point. A 7½-fathom spot lies about 0.8 mile within the entrance, 0.1 mile from the southern shore; otherwise depths within the bay for a mile from the entrance range from 19 to 31 fathoms. The head of the bay is blocked by small islands. A small cove with depths of 14 to 18 fathoms lies to the northward of **King Island**, the largest of the group. A bar, with depths of 3½ fathoms on it, stretches across the entrance to the cove from King Island to the rock off the point on the northern shore. A rock lies 75 yards northwestward of King Island, within the cove.

Clover Point, a narrow wooded neck of land about 100 feet high, projects northward for about 0.6 mile. About 1 mile inshore the land rises to a series of knobs and ridges, with higher peaks inland. A bank, small in extent, with 8 fathoms on it, lies 0.6 mile northeastward from Clover Point.

The cove to the westward of Clover Point is blocked by rocks and islets. The open bight 1 mile northwestward of Clover Point is deep. A small 8-fathom patch lies in midentrance. The cove, which lies about 1.6 miles northwestward from Clover Point, has depths of 11 to 12 fathoms until near the head. Rocks extend off the southern point of the entrance for 500 yards, and a rock, bare at half tide, lies in midentrance. A flat area, with depths of 16 to 17 fathoms, extends about 0.6 mile in a northeasterly direction from the north entrance point of the cove.

Charts.—8075, 8074, 8085, 8094.—The eastern shore of Clarence Strait from Dixon Entrance to Vallenar Point, at the western end of Tongass Narrows, is formed by three large islands, Duke, Annette, and Gravina, and a number of smaller islands. Between these islands flow Felice Strait and Nichols Passage which connect Clarence Strait with Revillagigedo Channel.

Chart 8075.—Sealed Passage is an approach to Felice Strait from Clarence Strait and lies between Duke Island on the east and Percy Islands and Hotspur Island on the west. On the southeast side of the southern end and extending 5 miles southwestward from **Point White,** the western extremity of Duke Island, there are numerous rocks, sunken and awash, of which Hassler Reef and the **Bee Rocks** are the outermost.

Duke Island, the rocks to southward, and Hassler Reef, 5.2 miles 215° from Point White, have been described in Chapter 4.

West Bee Rock which uncovers 7 feet and has a heavy bed of kelp extending 0.5 mile northwestward of it, is 4 miles 217° from Point White.

East Bee Rock which has two heads that uncover 12 feet is about 1.2 miles eastward of West Bee Rock. A rock with ½ fathom over it is 1.9 miles 019° from West Bee Rock.

A shoal with 1¾ fathoms over it, is 2.8 miles 179° from Point White.

Percy Islands are a large number of low wooded islands on the northwest side of Sealed Passage. The passages between these islands are not navigable except for very small craft with local knowledge. Anchorage can be had either northward or westward of the southernmost island.

Local magnetic disturbance.—Differences of as much as 17½° from the normal variation have been observed in the vicinity of the southernmost island at lat. 54°56.0′ N., long. 131°35.5′ W.

Sealing Reef is a double-headed rock, which bares 5 feet, about 1 mile 106° from the southern extremity of Percy Islands.

A pinnacle rock, not marked by kelp, on which a least found depth was 4¾ fathoms, is 1.5 miles 100° from the southern extremity of Percy Islands. The depth may be less. A group of rocks, some of which are 6 to 8 feet high, are 1.5 miles northwestward of Point White.

Hotspur Island, on the western side of Sealed Passage northeastward of Percy Islands, is heavily wooded and has its greatest elevation near the northern side.

Werlick Island, southward of Hotspur Island, is low and heavily wooded.

Vegas Islands, about 0.5 mile off the Duke Island shore, are 160 feet high and heavily wooded. Between them and Duke Island are several rocks.

Felice Strait extends from Clarence Strait to Revillagigedo Channel, between Duke, Dog, Cat, and Mary Islands on the southeast, and Annette Island on the northwest. It offers the most direct route for vessels from the southern end of Clarence Strait to the eastern arm of Behm Canal, but is little used. There are several dangers, but those lying nearest the sailing line either show above water or are marked by buoys, and no difficulty should be experienced in making the passage through the strait in daytime and with clear weather.

Currents in Felice Strait have considerable strength. At Harris Island they have a maximum velocity of about 4 knots, diminishing rapidly at short distances away. Around Snipe Island the currents have a maximum velocity of 4 knots. For daily predictions for places in Felice Strait, see the tidal Current Tables.

Point Percy, the westernmost point of Percy Islands and on the south side of the western entrance to Felice Strait, is a small island, 150 feet high, with a bold, rocky shore.

From Point Percy northeastward to Harris Island, the shore is free from dangers except close-to. Cow Island is a small, wooded island 100 feet high, northward of the Percy Island Group. Northward of Cow Island are two wooded islets; between the islets and Cow Island are two reefs that bare.

Point Davison and the western part of Annette Island are low and wooded. There are numerous off-lying islands and reefs for some distance from the main shore. The extremity of Point Davison is a double island with a small wooded patch on it, and is conspicuous only from eastward or westward. **Point Davison Light (54°59.7′ N., 131°36.8′ W.)**, 35 feet above the water is shown from a small white house on the outermost of the small islands off the south end of the point. A radar tower near the southern extremity of the point is conspicuous.

Harris Island is a small wooded island 90 feet high northwestward of Hotspur Island. Along the north shore of this island are considerable quantities of kelp which should be given a berth of at least 150 yards in rounding the island. Fair anchorage in 6 to 12 fathoms, sandy bottom, can be had 0.2 mile northeastward of Harris Island. A light 16 feet above the water is shown from a small white house on the north end of the island.

A group of wooded islets are 0.2 to 0.8 mile off **Sextant Point,** the first point northeastward of Point Davison. Foul ground extends for 500 yards northward and 700 yards southward of these islets. Between the islets and Sextant Point is a clear, deep channel, 400 yards wide. The main channel of Felice Strait passes eastward of the islets and midway between them and Harris Island.

Foul ground extends for 0.8 mile off **Moss Point,** which is 2 miles northward from Point Davison.

Chart 8074.—Tamgas Harbor has its entrance about 1.5 miles northward of Harris Island. It is a landlocked anchorage suitable for small and moderate-sized craft. The harbor is subject to strong winds in winter. Winds of over 70 miles per hour from northeast to southerly have been experienced when anchored off **Creek Point.** The depths are generally good except near the southwestern shore, which is shoal.

Annette (pop. 337; P.O.) is an unincorporated settlement on the west side of the harbor at the narrows. An airport is about 2 miles southwestward of the settlement.

Grass Rock, 0.2 mile off **Grey Point** on the western side of the entrance, is 15 feet high and grass-covered. A rock, bare at low water and marked by kelp, is about 200 yards 160° from Grass Rock.

Mule Rock, 0.2 mile from the eastern shore at the entrance, covers at high water; it may be passed on either side. It is marked by a light 30 feet above the water and shown from a small white house on a skeleton tower.

A shoal, marked by a buoy at its outer extremity, extends nearly 0.5 mile east-southeastward from **Deer Point** on the west side, 0.8 mile above Grass Rock.

Shoals extend 300 yards offshore between **Tent** and **Crab Points,** and 200 yards off **Yellow Point,** thus narrowing the channel to a width of about 250 yards between these points. A lighted buoy marks the end of the shoal off Tent Point, and a large rock is on the beach off the point. **Crab Point Shoal** is marked by a buoy. Northwest of Crab Point are three 300-foot radio towers with red obstruction lights. The waterfall at the mouth of the creek at the base of **Berry Knoll** is visible only at low water.

The best anchorage is in 6 fathoms in the middle of the basin, about 0.5 mile northward of Crab Point, taking care to avoid the 2½-fathom spot 0.4 mile northwestward of the point. Between Tent and Crab Points is an L-shaped fuel dock under jurisdiction of the Federal Aviation Agency, the outer face of which is about 200 feet long and has depths of 29 feet alongside. A float is on the north side of the fuel dock about midway to the shore. At the northwest end of the dock is a 25-ton stiff-leg crane. Diesel oil, kerosene, and gasoline are piped to the dock; no other supplies are available. A dolphin marks the limits of the shoal extending into the channel between the lighted buoy off Tent Point and the fuel dock. On the west side of Crab Point is a seaplane ramp of crushed stone and sand with a Marsden Mat

top 20 yards wide and 260 yards long. On the western shore in the northern part of the harbor is an unused supply wharf.

In entering Tamgas Harbor, pass about 500 yards westward of the light on Mule Rock and keep the eastern shore aboard, distant not over 300 yards until up to Tent Point. Then, guided by the aids, follow a midchannel track into the harbor.

Survey Point, eastward of the entrance to Tamgas Harbor, is indefinite; both it and the southeastern portion of Annette Island are low and wooded for a distance of 1.5 miles, and then the land rises rapidly to the summit of **Davison Mountain.**

Ajax Reef, 2.5 miles 091° from Harris Island and about 0.7 mile offshore, extends 0.2 mile in a northeasterly direction and uncovers 12 feet. It is surrounded by kelp. A light is on the south side of the reef on a rock awash at high water. The light, shown from a small white house on a tower, is 31 feet above the water.

Chart 8075.—Wallace Reef, 2 miles eastward from Ajax Reef and about 0.5 mile off the Annette Island shore, has a least depth of ¾ fathom over it, is surrounded by kelp, and is marked on its northerly side by a buoy.

Snipe Island is small, 10 feet above the water, and has a few grassy patches on the highest part. It is marked by a light 22 feet above the water shown from a small white house.

Annette Point, at the southeastern extremity of Annette Island, is low and wooded and has deep water close-to.

Indian Rock, 2 miles northeastward of Annette Point and 0.8 mile off Annette Island, is a cluster of rocks about 0.3 mile in diameter, several of which bare at extreme low water and are marked by heavy kelp. A lighted buoy marks the westerly side of the shoal.

Bostwick Reef is 1 mile northeastward of Indian Rock; it is of considerable extent, marked by kelp, and has a least found depth of 1½ fathoms.

Ryus Bay is on the northwest side of Duke Island 1 mile eastward of Vegas Islands. It is easy of access, well-sheltered, and affords excellent anchorage for small craft in 10 fathoms, mud bottom.

Tamgas Reef, about 0.8 mile off the Duke Island shore, appears as a five-headed rock, one head showing about 3 feet at high water, the others showing at various stages of the tide.

Niquette Harbor is on the northwest side of Duke Island and is about 0.3 mile wide at the widest part. It extends about 0.5 mile in a southerly direction, narrowing on an inlet about 0.5 mile long which dries. A sunken rock is 100 yards off the eastern shore of the narrowest part of the entrance to the harbor, and a rock awash is opposite close to the western shore. Favor the western shore in entering. Anchorage for very small craft may be had in 4 to 6 fathoms in the bight within the entrance. Two rocks, awash, extend about 150 yards northward from the point on the south side of the western shore of the bight.

Dog Bay is a small open bight with 33 fathoms at the entrance, 17 fathoms near the head, and 13 to 15 fathoms in the southeast corner. Rocks lie off the eastern and western shores, as shown on the chart.

Dog Island is heavily wooded and has a rocky shore. **Double Islands,** small and wooded, are connected at low water and are surrounded by a considerable area of rocks and reefs which bare. **Village Island** is low with a sand beach on all sides. During the summer months grass grows rankly around the old houses and totem poles on the island.

Fish Islands, two in number and surrounded by moderate-sized rocky ledges, are about 150 feet high and heavily wooded.

Pond Bay, southeastward of Dog Island between it and Duke Island, affords good anchorage when once inside, but is little used on account of the dangerous approach. The entrance from Felice Strait and Dog Bay, westward of Dog Island, bares about 2 feet. A 6-fathom passage leads northward of Dog Island into Pond Bay, but it is obstructed by rocks and requires local knowledge to enter safely.

The best approach to Pond Bay is from Revillagigedo Channel through **Cat Passage** between Grave Point and three islets off the southeast point of Cat Island. The best water leads about 0.3 mile off Grave Point until up to a reef extending southwestward from a small high-water island off the northeast point of the entrance to the bay; thence it leads about midchannel. It is advisable for strangers to enter at low water and with caution. Rocks in depths of 4½ and 6 feet have been reported in the western end of Cat Passage.

Beaver Creek, on the western side of Mary Island, is a small creek the entrance to which is not readily discerned at high water. A 2¾-fathom spot is 0.3 mile to the southwestward of its entrance, with a rock awash between it and the shore.

Custom House Cove is an indentation in the west side of Mary Island that affords good shelter during southeasterly weather. The anchorage is in the middle of the cove, 300 yards from the bare ledges fringing the shore.

Giant Point, the northern extremity of Mary Island, has reefs extending 200 yards northward from it.

Kwain Bay and **Crab Bay** are on the east shore of Annette Island opposite Mary Island. The former affords fair anchorage for moderate-sized vessels and has an entrance southward of the rocks in the center of the bay. Crab Bay is an excellent anchorage for small craft and is used considerably.

Charts 8086, 8075.—Nichols Passage is between **Annette Island** on the east and **Gravina Island** on the west, and connects Clarence Strait with the southeastern end of Tongass Narrows. It offers the shortest route for vessels from Dixon Entrance and the southern part of Clarence Strait to Ketchikan. There are several clusters of dangerous rocks in the passage but they are easily avoided in daylight and clear weather. The channel eastward of Warburton Island is the one generally used by large vessels and is marked by lights and buoys. Most

small craft when entering or leaving Clarence Strait from the north, or from Moira Sound, use the narrow channel which passes between the Bronaugh Islands and Gravina Island into Nichols Passage.

Currents.—Vessels bound to Nichols Passage from points across Clarence Strait should take the current into consideration, for the course is rarely made good. In Nichols Passage the flood sets northward with a velocity of 1 to 3 knots, the greatest strength being felt in the vicinity of Walden Rocks. Currents are considerably influenced by the winds. For daily predictions for places in Nichols Passage, see the Tidal Current Tables.

The southwestern end of Annette Island on the eastern side of Nichols Passage, from Point Davison to Yellow Hill, is about 200 feet high and wooded. The shoreline is irregular and broken by numerous small bights, islands, and rocks. **Yellow Hill** is a yellow-topped hill 1.5 miles southward from Metlakatla. The summit is formed by several bare, rounded knolls of approximately equal elevation.

Chart 8086.—Hid Reef lies nearly 2 miles off the Annette Island shore at the southern entrance to Nichols Passage. On the reef are three distinct clumps of rocks, bare at about half tide, with narrow passages between them. The outermost rock is 2.8 miles southwestward from Cedar Point, and is marked by a lighted whistle buoy.

Canoe Cove (Chart 8075) is used by small boats. It is entered through the wide north passage.

Smuggler Cove (Chart 8075) is open and exposed. In the upper part of the cove is a beach of fine clear sand 200 yards long.

Dall Head, the southern extremity of Gravina Island, is the western headland at the southern entrance to Nichols Passage. It is low and wooded. At a distance of 1.5 miles northward of Dall Head the land rises rapidly to the high mountains of **Dall Ridge,** which, with its high and remarkable peaks forms a conspicuous landmark from Clarence Strait and Dixon Entrance in clear weather. The southern end of Dall Ridge is unusually rugged and broken. The southernmost summit is crowned with a narrow cap of trees, below which for 600 feet are bare cliffs of gray and brownish rock. Several rounded hills covered with dead trees show white against the mountains of Dall Ridge. At the south end of Dall Ridge are two large landslides facing south.

Bronaugh Islands, extending from 0.5 to 2 miles southeastward from Dall Head, are low and wooded, with rocks and reefs surrounding them. The easternmost island of the group, known as **Point McCartey,** is bare on the southern and eastern edges. It is marked by **Point McCartey Light (55°06.9′ N., 131°42.3′ W.),** 50 feet above the water, shown from a small white house on a brown skeleton tower.

A rock bare at half tide, is 0.7 mile 235° from Point McCartey Light. Several other similar rocks are between this one and the Bronaugh Islands. A rock, which bares 2 feet and has deep water close to it, is about 0.3 mile 105° from Point McCartey. This rock is marked by a buoy.

Banks and broken ground, with least found depths of 7 to 15 fathoms, are about 0.6 mile northward from Point McCartey. This area should be avoided.

The narrow passage between Bronaugh Islands and Gravina Island has a least depth of 35 feet and is used considerably by small craft. It should be used only with local knowledge.

Dall Bay, on the western side of Nichols Passage, 1 mile northward of Dall Head, has many dangers which are shown on the chart. It offers good anchorage in 8 fathoms, mud bottom, between the two islands well inside the bay. There is also small-craft anchorage farther in, depth 3 fathoms, soft mud bottom. Local knowledge is essential for entering. A mooring dolphin is near the head of the bay and there is a privately maintained mooring float. The bay is used for storing fish traps.

Chart 8074.—Warburton Island is about 2.8 miles northeastward of Point McCartey and 1.2 miles from the shore of Annette Island. It is about 0.2 mile in diameter, 130 feet high, round-topped, and has steep, rocky shores. A rock with 1½ fathoms over it lies nearly 300 yards northwestward of the island. A light, 35 feet above the water is shown from a small white house on the eastern side of the island.

Kelp Rocks are four widely-spaced patches surrounded by deep water, northwestward of the light on Warburton Island. The northeasternmost patch is marked on its northeast side by a buoy. Warburton Island, open from the southwest end of Annette Island, leads eastward of Kelp Rocks. The northeasternmost rock is on the range of the waterfall in Port Chester and the north end of Gull Island.

Port Chester is an extensive bay indenting the western shore of Annette Island eastward of Warburton Island. **Village Point,** on the south side of the entrance, is low and sandy, with a gravel beach on the eastern side. Westward of Village Point are extensive reefs which bare to a distance of 0.2 mile offshore. A light 40 feet above the water is shown from a skeleton tower on the Union Oil Company wharf at Village Point.

Metlakatla (pop. 798; P.O.), a native mission, is on the south side of Port Chester. The small city wharf and float is on the west side of Village Point. There is a depth of 10 feet at the outer face of the wharf; the float nearly bares at extreme low water. About 300 yards southeastward of Village Point are a cannery and wharf. There is a least depth of 23 feet alongside the wharf near the center, with deeper water toward the ends. The wharf is 185 feet long. Vessels usually make a port landing. Fresh water is piped to the cannery wharf. There is a store, where provisions in limited quantities can be obtained, and also a blacksmith shop. A large white church with two square towers is conspicuous from Nichols Passage.

A 10-foot deep anchorage basin with a float for small craft, and protected by a stone breakwater, is southeastward of the cannery wharf at Metlakatla. A light 15 feet above the water is shown from a skeleton tower on the north end of the breakwater.

Port Chester is encumbered by numerous islands and reefs, of which the southernmost is **Gull Island,** 150 feet high and wooded. Lying 0.4 mile west-southwestward of Gull Island is a rock awash at highest tides, surrounding which, and extending to the islet, are extensive ledges with bare heads; the western extremity of these ledges is marked by a buoy. Another ledge with bare heads extends about 0.6 mile eastward from Gull Island. A lighted buoy is moored on the west side of the 1¼-fathom rock lying 0.7 mile eastward of Gull Island.

Scrub Islands have two scraggy clumps of trees and are surrounded by ledges, mostly covered at high water.

Hub Rock, about 1 mile east-northeastward of Village Point, is a small bare ledge about 6 feet above high water. A 1-fathom spot is about 0.3 mile 030° from Hub Rock.

Martin Rock, awash at low water, is 0.2 mile 322° from Hub Rock; it is not marked by kelp.

Murdo Island, about 1.1 miles northward of Village Point, and locally known as **Battleship Island** from its one mast-like dead tree and several turret-like stubs, is grass-covered, with several small trees growing among the stubs. Extensive ledges extend westward and southward from the island.

Fillmore Rock is about 0.3 mile north-northwestward of Murdo Island and bares 1 foot at lowest tides.

Lively Rock is about 0.5 mile 350° from Murdo Island and has 5 feet over it at low water. It is marked by a lighted buoy moored northeast of the rock.

Hemlock Island, close to the north shore of Port Chester, is wooded. It is fringed with reefs, and at lowest tide is connected at its northerly corner with Annette Island.

Leading to Port Chester are three channels, of which the southern one, between Gull Island and Village Point, is of chief importance; the dangers are shown on the chart. Enter on an **085°** course with Warburton Island Light directly astern. The second entrance is the narrow passage between Murdo and Gull Islands; it is seldom used.

The northern entrance leads from off Driest Point to Midway between Hemlock Island and the lighted buoy marking Lively Rock, then southward between Scrub Islands and the eastern extremity of the ledge extending eastward from Gull Island, passing close westward of the lighted buoy marking the 1¼-fathom rock. This channel should not be used without local knowledge.

Port Chester does not afford good anchorage. During southeasterly gales winds blow with great violence across it, and williwaws of almost hurricane force sweep down from **Purple Mountain** and across the anchorage. Anchorage is to be had in 14 fathoms, mud bottom, about 0.5 mile eastward of the cannery wharf.

Driest Point, on the northwest side of Port Chester and separating it from Sylburn Harbor, is a narrow rocky stretch of land, 250 feet high, and wooded down to high-water line. Foul ground extends 0.5 mile northward from the point. A light, 29 feet above the water is shown from a small white house on the western extremity of the point.

Sylburn Harbor is a small bay northward of Driest Point, the south end of which affords fair anchorage for small craft in 7 to 18 fathoms. Nearly in the middle of the outer entrance to Sylburn Harbor is a large double rock which is covered several feet at high water. Strangers entering the harbor are advised to wait for low water when the dangers are visible. A **159°** course, with the middle of Blank Inlet astern and the middle of the south bight ahead, leads midway between the foul ground off Driest Point and the rock in the middle of the outer entrance.

Chart 8085.—Seal Cove is on the west side of Nichols Passage, 4 miles northward of Point McCartey. It has depths of about 30 to 36 feet, but on account of its narrow entrance, is suitable only for small craft. A reef, mostly bare at half tide, extends across the entrance, through which are two channels. The northern one has a depth of 8 feet and width of 75 yards, but it is full of boulders and dangerous. The southern entrance is buoyed and is generally used. It is close to the southern shore, between it and a ledge bare at low water about 50 yards off, and has a depth of 9 feet. There are thick kelp and strong currents in the channel. **Seal Cove Rock** with 1 fathom over it, surrounded by kelp and marked by a buoy, is 0.4 mile 097° from the highest part of the reef in the entrance to Seal Cove.

Chart 8075.—Bostwick Inlet is on the west side of Nichols Passage, 6 miles northward of Point McCartey. It affords no shelter in southeast weather. The southerly shore is generally foul and the upper part of the bay bares for 0.8 mile from the head. In entering, follow the north shore at a distance of about 0.2 mile. A buoy is moored on the southwestern side of the channel in a depth of 13 feet, 200 feet northeastward of a rock awash at high water.

Chart 8094.—Blank Inlet, westward of Gravina Point, the eastern extremity of Gravina Island, extends 3 miles northwestward into the shore of Gravina Island. It is open to the sea from Nichols Passage and affords no sheltered anchorage. A rock, which bares 7 feet, is almost in the center of the inlet.

Blank Islands, two in number, 200 feet high and wooded, are near the north side of the entrance to Blank Inlet. The southerly shoreline is bare rock for 50 to 100 yards outside the trees, and the shore is bold. Small craft can find good anchorage in the bight on the north side of the islands. **Blank Islands Light (55°16.0′ N., 131°38.3′ W.),** 30 feet above the water, is shown from a small white house on the southeastern extremity of the southern Blank Island.

Walden Rocks are a group of bare rocks at the north entrance to Nichols Passage. The group at its eastern end shows about 10 feet at high water, at which time the smaller rocks are covered. About 150 yards westward of the group, is a rock that covers at half tide and shows kelp. Close northward of the group are other kelp-marked rocks, and 0.2 mile north-northwestward is a rock with 1 fathom over it. About 0.6 mile southward of

Walden Rocks is a rocky ledge which uncovers 12 feet; between it and Annette Island are a number of rocks which bare.

On **Walden Point** is a native fishing camp with considerable shelter for small craft directly off it. **Bailey Rock,** which covers at high water, is about 1 mile southward from Walden Point. It is marked by a light 24 feet above the water and shown from a white slatted daymark on a post.

Annette Bay, at the northwestern end of Annette Island, is 0.8 mile wide at the entrance and narrows to a small stream; it is about 3 miles long, has deep water, and does not afford anchorage for vessels. Small craft can anchor near its head in 7 to 8 fathoms. **Race Point,** the northern extremity of Annette Island, and the northeastern point at the entrance to the bay, is wooded and has a greatest elevation of about 150 feet. A ledge, which covers at high water only, extends 300 yards in the prolongation of Race Point. The point should be given a berth of over 500 yards.

Chart 8102.—The western shore of Gravina Island from Dall Head to South Vallenar Point is heavily timbered, bold, and rocky. Close to shore are many large boulders and rocks, and the bottom is rocky and uneven. The 100-fathom curve is from 0.5 to 0.8 mile offshore and it is advisable to give the coast a berth of that distance.

Tidal currents are usually strong close to shore, especially on the flood, reaching an estimated velocity of 2 knots. Small tide rips are found off the more prominent points when the wind is opposed to the current. Westward of Bronaugh Islands moderate tide rips are set up on a flood current with a northerly wind. Around South Vallenar Point, an estimated velocity of 2.5 knots is reached on the flood and 1.5 knots on the ebb, with moderate tide rips when wind and current are opposed. West of Vallenar Point the flood current is estimated at 3 knots and 1.5 knots on the ebb with strong tide rips on the ebb during a southeasterly storm.

Dall Head has been described with Nichols Passage.

Chart 8086.—Rocks and islands extend about 0.6 mile offshore for a distance of 1.2 miles northwestward from Dall Head. A small open bight, foul near the head, with depths of 6 to 7 fathoms in the entrance, is 1.4 miles northwestward from Dall Head. A small rocky islet is off the southern shore of the entrance. A rock covered 1 foot is 400 yards off the wooded islet southward of the entrance; it is 1.5 miles 292° from Dall Head.

Nehenta Bay, open to the southward, is 2.5 miles northwestward of Dall Head. Depths of 12 to 14 fathoms were obtained in the channel westward of the small rocky islet in the middle of the entrance which marks the end of the chain of rocks and rocky islets which extend northward from the island at the south entrance point. Foul ground extends 0.1 mile from the head of the bay, and a 6-foot spot is 650 yards 212° from the midchannel rock. Depths of 12 to 14 fathoms were obtained in the middle of the bay, while depths of 17 fathoms were obtained in the small bight eastward of midchannel rock. The narrow arm, 0.4 mile long in a northwesterly direction on the northwestern side of the bay, has a depth of 3½ fathoms at the entrance and 2½ fathoms halfway to the head. A reef extends from the northern shore to within 50 yards of the southern shore of this arm.

Phocena Rocks, the highest 25 feet, are 275 yards offshore, westward of the northwestern point of the entrance to Nehenta Bay.

Chart 8102.—The small cove, 3.6 miles northwestward from Dall Head, open to the southward, has depths of 9 to 15 fathoms just within the entrance. Foul ground extends about 200 yards off the western point of the entrance. The northwest corner of the cove is foul for about 0.1 mile from the shore, to the southward of which is an area about 200 yards wide, with depths of 1 to 3 fathoms, where fishermen find fair-weather anchorage. The bight to the eastward of the eastern point of the entrance has 7 fathoms at the entrance and shoals rapidly to the head. The cove between the double point westward of the entrance to the cove is foul.

Nelson Cove, 5 miles northwestward from Dall Head, is open to the westward and northwestward. Depths of 6 fathoms are found at the entrance, 1 fathom 150 yards within, and shoal water to the head.

Chart 8094.—**Grant Cove,** 1.6 miles south-southeastward of South Vallenar Point, is exposed to the westward. From depths of 21 fathoms at the entrance it shoals to 10 fathoms at the edge of the flat 300 yards from the head. A small wooded islet, a small rocky islet, and a rock awash lie about 250 yards off the southern point of the entrance. A mooring log is anchored near the head of the cove in 10 fathoms.

The small cove 0.8 mile north-northwestward from Grant Cove is open and exposed, shallow and foul, and a rock which bares 3 feet on the lowest tides lies 220 yards off the northwest entrance point of this cove. The small cove 1.1 miles north-northwestward from Grant Cove bares at low water, with the exception of a very narrow opening 200 yards long midway in the entrance which has depths of about 2 fathoms. A large kelp-marked shoal which bares, is about 0.5 mile west-southwestward of the cove.

South Vallenar Point, near the northwest end of Gravina Island on the northeast side of Clarence Strait, may be recognized by three bare rocks on its north side.

A ridge with three shoal spots extends 1 mile north-northwestward from South Vallenar Point. The first, with depths of 5 fathoms, is 0.3 mile from the point; the second, with 1¾ fathoms over it, is 0.5 mile from the point; the third, with 6½ fathoms over it, is 1 mile from the point. The bottom is rocky, very irregular, and there is a possibility of lesser depths.

Vallenar Bay, between South Vallenar and Vallenar Points, affords good shelter from winds drawing up the strait. Close northeastward of South Vallenar Point are three low bare rocks about 0.2 mile apart, with no passage southward of them. A mud flat, which dries, extends 0.5 mile from the head of the bay. Anchor in

about 14 fathoms with the two southernmost rocks in line, and Guard Islands in line with the high bank forming the northeast shore of the bay.

Vallenar Point and Guard Island have been described in Chapter 4.

Chart 8142.—Kasaan Bay, 47 miles northward of Cape Chacon, has its entrance on the western side of Clarence Strait, between Island Point and Grindall Island, where it is 4 miles wide. It extends about 17.5 miles westward to Karta Bay at its head. About halfway up the bay, in the middle, are several islands. The shores of the bay and islands are steep-to and heavily wooded. A high steep mountain range extends along the northern shore of the bay almost to the head. Fog often prevails in the southern part of Clarence Strait, while it is clear in Kasaan Bay. During southeasterly stormy weather, clouds and mist travel low along the northern shore, while the southern shore is generally free from low-flying scud. During southeast storms the sea at the entrance is rough and treacherous for small craft. Temporary anchorage while waiting for the fog to lift may be had on an extensive bank, 0.6 to 1.2 miles southward from Grindall Point in depths of 8 to 16 fathoms. All known dangers are shown on the chart. Midchannel depths are generally good.

Currents in Clarence Strait from Clover Bay to High Island are most noticeable on the flood, and with a southerly wind attain an estimated velocity of 2 to 2.5 knots. From Island Point southward there is generally a southerly eddy close to shore during flood tides. Off Island Point and the east end of High Island, moderate tide rips are formed when the wind is against the current.

Island Point, the south point at the entrance to Kasaan Bay, is rounded and wooded and has an elevation of about 100 feet. A small rocky islet is close to the northern shore and two small rocks are close to the eastern shore of the point. The shoreline is grayish-white rock about 25 feet high. Moderate tide rips are encountered off the point.

The small cove to the westward of Island Point has depths of 22 fathoms at the entrance shoaling to 6 fathoms near the head. It is used as an anchorage by fishing boats but is exposed to the northward.

Twenty Fathom Bank is 2 miles east-southeastward of Island Point. The bottom is rocky with a least depth of 17 fathoms. The bank is used extensively by fishermen engaged in trolling.

High Island, about 1.3 miles northward of Island Point, is wooded. From the southward there appears to be twin summits on the island, but they merge into one from the eastward and again become visible from the northwestward. The slope of the island is uniform. The northeast and south shores are abrupt consisting of gray rock, 20 to 40 feet high.

High Island Light (55°24.1′ N., 132°09.8′ W.), 40 feet above the water, shown from a small white house on the northeastern side of the island, marks the entrance to Kasaan Bay. A rocky islet with a few trees on it, is off the southeastern end of the island.

Patterson Island extends westward for 1.3 miles from the western end of High Island, from which it is separated by a channel about 100 yards wide, with a depth of 6 fathoms, which is clear for small boats. The island is timbered and has three summits; the highest is at the eastern end. A bight makes into the southerly shore of the island near the western end in the depression between the western summit and the eastern ridge. It is used as an anchorage during northerly weather, but affords no protection during southeasterly weather. Several rocks which cover at high water are at the entrance. The outermost rock, which bares at half tide, is 0.25 mile 116° from the western point of the entrance to the bight. A house is at the head of the bight.

A rock with 1¼ fathoms over it is about 0.4 mile south-southwestward from the easternmost point of Patterson Island, and it is not always marked by kelp; otherwise the passage southward of the island is clear.

Grindall Island, the northern point of the entrance to Kasaan Bay, is 4 miles northward from Island Point. It is heavily wooded and has two knobs near the southwest end, the western knob is the highest. The eastern part of the island is low. **Approach Point** is the eastern extremity of the island.

Local magnetic disturbance.—Differences of as much as 5° from the normal variation have been observed on Grindall Island in the vicinity of Approach Point.

Grindall Point, the southeastern end of Kasaan Peninsula, has a symmetrical rounded hill, which is visible in nearly every direction. Being separated from the higher land of the peninsula, it forms an excellent landmark. From the upper reaches of Kasaan Bay it could possibly be mistaken for the hill on Grindall Island, which it obscures from view.

Grindall Passage is frequently used by those with local knowledge. It is safe for steamers, though the clear part of the channel is only 150 yards wide in the narrowest part. A wooded islet and two bare rocks south of it lie close to the western end of Grindall Island. A 1½-fathom spot lies 275 yards 290° from the southernmost rock. A rock with a depth of 2¼ fathoms is in the middle of the passage, 300 yards northward of the wooded islet off the western end of Grindall Island. A patch of foul ground is on the western side of the southern entrance to the passage. This foul ground will be cleared by keeping eastward of the range formed by two prominent points, one on either side of the cove on the western side of the passage. The northern point has a wooded islet close by which should not be mistaken for the point. Pass close to the southern point of the cove to avoid the 2¼-fathom spot in the middle of the passage. The northern entrance is clear.

A good anchorage for small vessels in northerly weather, may be had in what is locally called **Grindall Anchorage,** the small cove at the end of Grindall Point. Anchor in 7 to 12 fathoms, soft bottom. In southerly weather fair protection can be found directly across the pass off the abandoned fox farm buildings. Fresh water may be obtained here. The current floods easterly through Grindall Passage and ebbs westerly, and is of moderate strength.

Trollers Cove is back of a chain of islands about 1.8 miles westward from Island Point. The cove is about 225 yards in diameter and has depths of 4 to 6 fathoms. It is considered a good small-boat anchorage and is used by those fishing on Twenty Fathom Bank. Three channels may be used in entering. The channel eastward of the islands bares, is foul, and should be used only by those with local knowledge. The channel in the middle of the chain of islands has a depth of 2 fathoms. It is marked by a light 15 feet above the water and shown from a small white house on the east end of a small island on the west side of the entrance to the cove. The channel westward of the islands is the best.

Round the western island at a distance of about 125 yards and then follow a midchannel course to the southward of the islands. Pass about 50 yards southward of the south shore of the eastern island to avoid a sunken rock which is about 100 yards southward of the island. When abeam the southeastern end of the island, anchor in about 4 fathoms.

The small cove westward of the western island has three rocky islets and several rocks marked by kelp in the center. It is not recommended as an anchorage.

Skowl Arm is about 12 miles long, and the head of it is only about 2 miles from the head of Cholmondeley Sound, though the intervening land is high. The southern point at the entrance to this arm is known as Skowl Point; it is really a group of small islands lying close inshore. A light, 12 feet above the water and shown from a wooden tower, is on the outlying bare rock about 300 yards northward of the point.

On the north side, about 3.5 miles up the arm, is the abandoned Haida village of **Old Kasaan.** No evidence of the village now exist, other than a few weathered totem poles and a few graves. **Old Kasaan National Monument** was established October 25, 1916. The monument is under the jurisdiction of the National Park Service and contains 38 acres. In front of the village site is a ledge, covered at high water, extending about 100 yards offshore.

Smith Cove, the large bay eastward of Old Kasaan village site and about 2 miles west of **Kasaan Point,** affords good anchorage in 10 to 20 fathoms, soft bottom. It should be entered with caution, taking care to avoid the rocks and shoals lying off the two small wooded islets at the entrance.

Saltery Cove is a small bay, about 1 mile long, in the southeastern shore of Skowl Arm, about 2.5 miles westward of Skowl Point and close eastward of McKenzie Inlet. A group of islands is in the entrance to Saltery Cove. Five rocks which bare are off the north end of the largest island, the outermost of which is about 300 yards from the north point of the island. A light, 6 feet above the water and shown from a small white house, is on a small islet 0.4 mile 109° from Khayyam Point, the western entrance point of the cove.

There is a reef on the eastern side of the cove and shoal water at its head. The channel eastward of the group of islands in the entrance is the one mostly used. At the head of the cove is a well-protected anchorage for small craft in 4 to 9 fathoms, mud bottom.

McKenzie Inlet, the south branch of Skowl Arm, extends 5 miles in a southerly direction. **McKenzie Rock,** which always shows, is about 0.5 mile westward of **Khayyam Point,** the eastern point at the entrance; there is no safe channel between. A rock awash is 300 yards from the eastern shore, 0.5 mile southward of McKenzie Rock. The only good anchorage in Skowl Arm for vessels of any size is in McKenzie Inlet, about 500 yards northward of East Sentinel Island, in 28 fathoms, mud bottom.

About 1 mile inside the entrance the channel leads between **East Sentinel** and **West Sentinel Islands,** two rounded wooded islands. Kelp extends from the islands a short distance into the channel, which is narrow and in which the controlling depth is 5¼ fathoms. A careful midchannel course between the islands leads through safely; southward of the islands the inlet is clear. There is good anchorage near the head of the inlet on the west side of **Peacock Island,** in depths of 7 to 10 fathoms, soft bottom.

Paul Bight, on the western side of the entrance to McKenzie Inlet, affords anchorage for small craft in 5 to 8 fathoms. A group of bare rocks is off the northern point at the entrance. In entering, favor the southern point.

Polk Inlet extends west and south from beyond the village of Old Kasaan. The entrance is foul and extreme caution must be exercised when entering. The current in the entrance to the inlet is weak.

Black Rock, which bares 9 feet, is about 1 mile northward from Kasaan Point. The range formed by the northeast tangent of **Daisey Island** and the rocky islet southeastward of Daisey Island clears Black Rock by a distance of 0.1 mile.

Kasaan Island, low and wooded, and **Round Island,** a small wooded islet northwestward of Kasaan Island, are the most noticeable of the islands in the middle of Kasaan Bay. A reef that uncovers 12 feet is 0.6 mile 160° from the west end of Kasaan Island. The channel southward of this reef and southward of Kasaan Island has been found clear of dangers. The entrances at both ends of the channel are clear, with the exception of a 2¾-fathom spot 0.1 mile northwestward of **Berry Island.** A 5¼-fathom spot is 0.8 mile 125° from the east end of Kasaan Island.

Anchorage for small boats is to be found in the landlocked inlet on the northeast side of Kasaan Island in 7 to 10 fathoms, soft bottom. This is called **Happy Harbor** locally. The entrance is 4 feet deep and caution is necessary in entering. A light, 13 feet above the water and shown from a small white house, is on the southeasterly side of the inlet. A buoy is moored on the east side of the channel about 200 yards northward of the rock, awash, off the northeastern entrance point. After entering the narrow channel, favor the east side until through the entrance.

The lagoon on the south side of Kasaan Island is sheltered but subject to strong winds drawing through from the north. The channel is very narrow and bares.

The small bay about 1.8 miles southward of the western end of Kasaan Island affords anchorage for small boats in depths of 6 to 10 fathoms. A reef, which bares, extends

about 0.1 mile eastward of the small island at the southwestern side of the entrance. A dangerous rock with least depth of 6 feet is directly in line with the end of the reef and the point on the east side. When entering favor the point. Depths of 4 fathoms were obtained in the entrance.

Kasaan (P.O.) is a native village on the north shore of Kasaan Bay about 10 miles westward of Grindall Island. The main wharf has a face 125 feet long with a depth of 32 feet alongside. Fresh water is available on the wharf, but no supplies. The cannery forming the main buildings and fronting on the wharf has not been in operation since 1954. **Kasaan Light (55°32.1′ N., 132°23.6′ W.)**, 26 feet above the water, is shown from a small white house on shore, southeast of the cannery. The point westward of the village is foul and should be given a berth of at least 150 yards.

Coal Bay, on the south shore of Kasaan Bay about 1.5 miles southeastward of Outer Point, affords good anchorage in 15 fathoms except in northerly weather. It is probable that winter gales from the northwest blow hard into the bay. A reef, which bares, extends about 0.3 mile in a northerly direction off the western point of the entrance to the bay. A shoal, with 2¾ fathoms over it, is 0.4 mile 062° from the same point.

Kina Cove is about 0.5 mile westward of Coal Bay. It affords good anchorage in 8 to 10 fathoms, 0.8 mile inside the entrance. In entering, follow a midchannel course. A reef is about 100 yards off the western shore about 0.1 mile southward of the western point of the narrow entrance to the inner bay.

Karta Bay, at the head of Kasaan Bay about 2 miles northwestward of Sandy Point, affords good anchorage in 10 to 12 fathoms, with a clearance of about 430 yards. **Mound Point,** on the north side of the entrance to Karta Bay, is prominent. A light 42 feet above the water is shown from a small white house on the point. A buoy, moored in 30 feet, marks the northern edge of a 4¾-fathom shoal, 1 mile 114° from the light on Mound Point. A number of shoals with less water on them are farther inshore in the direction of Sandy Point.

It Mine, on the north side of Kasaan Bay about 3.5 miles westward of Kasaan, has been abandoned.

The head of Kasaan Bay is separated from the main part of the bay by a chain of wooded islands and affords secure anchorage in 5 to 8 fathoms. In heavy southeast weather the northeast part of this inner bay affords the only secure anchorage in 7 to 12 fathoms, soft bottom. The best entrance is between the fourth and fifth islands counting from eastward. This passage, marked by buoys, is 225 yards wide, but the channel is only 50 yards wide between the 3-fathom curves, with a depth of 4 fathoms in midchannel.

Salt Chuck, at the head of Kasaan Bay, can be entered only at the higher stages of tide. The entrance is very narrow with a depth of only 2½ feet abeam of the abandoned light which marks it. Beyond the light structure the channel deepens to 8 feet. Salt Chuck, a landlocked harbor with depths of 7 to 11 fathoms, soft bottom, is 1.3 miles in length and 0.5 mile wide. The **Salt Chuck Mine** at its head is not operating.

The only known danger inside the harbor is an extensive shoal making out from the eastern shore of the wooded island on the right near its southern end. The end of this shoal bares at a minus tide. This bay must be entered with caution and only with local knowledge.

Twelvemile Arm, an inlet extending southwestward from near the head of Kasaan Bay, is about 12 miles in length and narrow. The depths are generally good.

Sandy Point, the northerly point at the entrance to Twelvemile Arm on the western shore, is low and wooded. A reef about 300 yards wide extends off the point in a south-southeasterly direction for about 500 yards. The approximate center of the reef is marked by a flat islet only about 4 feet high. The immediate vicinity of this reef is shoal and rocky. For a mile to the southwestward, the shoreline forms two small bights, and is marked by rocks and islets. Beyond this point the shore is clear to Loy Island and the entrance to Hollis Anchorage.

Outer Point is a rocky, wooded promontory, on the southern shore at the entrance to Twelvemile Arm. A small island with a lone tree on it is just off the point to the northeastward, in Kasaan Bay. Reefs extend about 150 yards offshore on the Twelvemile Arm side. A 4½-fathom spot is about 300 yards northwest of the point.

Jarvis Island is about 1 mile southwestward of Outer Point along the southeast shore of Twelvemile Arm. The shoreline is abrupt like the general shoreline. The northernmost of the Jarvis Islands is a small grass-covered rock about 0.3 mile from shore. A 1¼-fathom shoal is about 300 yards north-northwestward of this rock. About 1.5 miles southwestward of Outer Point, a small, almost round island stands out from this group. It is wooded and about 200 feet high to the tree tops. A reef about 50 yards in diameter is just off the north shore of this island. To a ship entering Twelvemile Arm, this reef appears as two rocks awash, except at very low water. At high water the reef is covered.

Loy Islands, a group of small islands, lie to the northeastward of the entrance to Hollis Anchorage on the west shore of Twelvemile Arm. The water toward the center of the arm from these islands is clear. Behind the islands the bottom is foul and full of reefs. The bight is hardly large enough for anchorage and the rocks render it of no value as such.

Hollis Anchorage, on the west side of Twelvemile Arm, affords good anchorage in 6 to 7 fathoms, but it is somewhat constricted by a 1½-fathom rocky shoal of considerable area which extends about 250 yards off the southeastern shore; also by the extensive flat which extends off the mouth of **Maybeso Creek.** In entering, avoid the gravel reef that uncovers 8 feet making off from the southern shore to the center of the channel, and the rock that uncovers 5 feet lying 80 yards off the north shore opposite the reef.

The approach channel to Hollis Anchorage has been cleared by wire drag to a depth of 24 feet. The small arm of Hollis Anchorage that extends northeasterly was

made the terminus for pulp logging operations in 1953. A road has been bulldozed to this arm and houseboats and other floating equipment have been semi-permanently moored near the head of the arm. The controlling depth is 12 feet. The usable area of the arm is very limited and is suitable only for small vessels. The cleared 12-foot dragged area is only 45 yards wide at the entrance to the arm. The shoal area on the northwest side of the arm extends with depths of 5 to 10 feet for two-thirds of the distance across the entrance.

Althouse Point is the southern point at the entrance to Hollis Anchorage. A rocky shoal with 2 fathoms over it is 550 yards southward of the point and 330 yards offshore.

Harris River Bay, at the mouth of **Harris River** is bare, but at high tide small craft can reach the abandoned Harris Creek Mine, 1.5 miles from Twelvemile Arm. A road leads to the mine from the southern point of the bay.

Midchannel courses lead in good water through Twelvemile Arm. Numerous rocky reefs at the points do not extend more than 60 yards offshore. In the middle of the arm, about 0.5 mile 030° from the first wooded islet at the head of the arm, is a small grass-covered islet which is just awash at extreme high tide. A rocky shoal that bares is 500 yards 030° from this islet and numerous patches of rocks that uncover 4 feet lie between the islet and the western shore.

Chart 8102.—The coast of **Cleveland Peninsula** from Caamano Point to Lemesurier Point, a distance of 20.5 miles, is rocky, bold, and heavily wooded. Deep water is close inshore and there are no dangers more than 0.5 mile offshore.

Between Caamano Point and Lemesurier Point are several shallow bights where launches may anchor, but their use during stormy weather is attended with extreme danger.

Caamano Point, the southern extremely of Cleveland Peninsula, is marked by a light. Ledges extend southeastward.

Chart 8142.—Niblack Point, 5.5 miles northeastward of Caamano Point, is marked by a daybeacon.

Ship Island, 14.5 miles above Guard Islands and 0.3 mile offshore on the east side of Clarence Strait, is 35 feet high, and has a few scraggy trees on it. A ledge extends a short distance from the south end. **Ship Island Light (55°36.0′ N., 132°12.1′ W.),** 40 feet above the water is shown from a small white house on the highest part of the island. Passage between the island and the mainland should not be attempted without local knowledge; floating fish traps are in the area.

Chart 8124.—Meyers Chuck is a small harbor about 1.6 miles southeastward of Lemesurier Point. The entrance is between a light 22 feet above the water shown from a small white house on the north end of **Meyers Island** and a buoy which marks the end of the reef which extends eastward of the small island northward of Meyers Island. A small settlement is in the cove back of Meyers Island. Good anchorage for small craft can be had and there are two floats. There is a general store and gasoline can be obtained. There are a grid for beaching small boats and a machine shop and blacksmith shop for minor repairs to machinery. Anchorage for small craft can also be had in the narrow arm next to the mainland. This arm, however, freezes over in the winter and the outer harbor does not.

To enter, give the northwestern point of Meyers Island a good berth to avoid a sunken rock with 5 to 6 feet over it, which is reported to lie about 100 yards off this point. Pass midway between the light and the buoy and turn southeastward into the harbor.

Misery Island, is 0.5 mile northwestward from Meyers Chuck. The western shore is faced by almost perpendicular cliffs about 40 feet high. Two rocks are southward from the island; the outermost, distant about 300 yards, bares 4 feet. A small rock, marked by kelp, is 300 yards eastward of the island. A sunken rock with about 4 feet over it is reported to lie about 150 yards off the mainland shore, about 0.3 mile eastward from the southern point of Misery Island. There is reported to be 3 or 4 fathoms in the passage between the north end of Misery Island and the mainland. Favor the mainland shore.

Lemesurier Point, the south point at the entrance to Ernest Sound, is long, low, and wooded; its shores are bold.

Lemly Rocks, 0.2 mile off Lemesurier Point, are about 3 feet high. At low water there are three rocks close together with sunken rocks between them.

McHenry Ledge, with a depth of ¼ fathom and showing kelp, is 0.7 mile 320° from Lemly Rocks; it is marked by a lighted bell buoy 0.1 mile northwestward of it. There is a good passage between McHenry Ledge and Lemly Rocks, but the currents have considerable velocity; strong tide rips have been reported. A number of groundings have occurred on Lemly Rocks in attempting the passage in thick weather.

Chart 8142.—The western shore of Clarence Strait from Grindall Island to Windfall Harbor, a distance of about 12 miles, is rocky, abrupt, wooded, and rises rapidly to peaks. There are small inlets and indentations, the largest of which are Lyman Anchorage and Windfall Harbor.

Streets Island is a rocky islet, 0.4 mile from the western shore of Clarence Strait, and about 2.2 miles northnorthwest from Approach Point, Grindall Island. Kelp extends a short distance from the ends of the island. A depth of 4¼ fathoms was obtained in the channel between the island and Kasaan Peninsula.

Lyman Anchorage is on the southwest shore of Clarence Strait about 4.5 miles southwestward of Ship Island. Its outer part is an open bight about 1 mile wide at its entrance. The inner harbor, extending 0.5 mile to the southwest from the head of the main bay, is about 200 yards wide, and has a controlling depth of 1¾ fathoms at

its narrowest part. It offers excellent shelter in all weather for small craft, 3 to 8 fathoms anchor depths, mud bottom.

Lyman Point is the eastern point of the entrance. Rocky shoals lie north and northeastward of the point.

Lyman Rock, awash at lowest tides, is near the middle of the anchorage, and is marked by a buoy on its southeast side.

Hadley is an abandoned settlement on the southeast side of Lyman Anchorage eastward of **Sawmill Point.** It was the shipping point for mines in the vicinity, which are not now in operation. The wharf is in ruins.

Figgins Point is a very bluff point approximately 1 mile northward of Lyman Anchorage. Rocks, which bare, are about 150 yards off the point.

Windfall Harbor, about 4 miles northwestward of Lyman Anchorage, is a narrow, crooked inlet extending southwestward for approximately 1 mile. Its entrance is obstructed by rocks, reefs, and islands. It is a poor anchorage and should be avoided by all except small craft with local knowledge.

Chart 8102.—From Windfall Harbor to Tolstoi Point small rocks and islets extend offshore for about 300 yards. **Tolstoi Point,** 9 miles above Lyman Point, is high, bluff, wooded, and has a low, bare rock close to its north end and a similar rock at its western end.

Local magnetic disturbance.—Differences of as much as 3¼° from normal variation have been observed at Tolstoi Point.

Chart 8124.—Tolstoi Bay has its entrance westward of Tolstoi Point and extends in a general southerly direction for about 4 miles. The eastern shore is high and steep; the head of the bay is flat, and the land is low and marshy. Near the eastern shore at the head of the bay is a wooded islet, and south of it is a line of islets and rocks, some of which are covered at high water. There is anchorage in about 10 to 15 fathoms in midchannel westward of the wooded islet, protected from all directions except from northward, from which direction the wind and sea come home, making the anchorage uncomfortable. Southwest winds draw through with considerable force. A midchannel course leads to the anchorage.

On the west side of Tolstoi Bay about 1.2 miles southward of the entrance is a small harbor marked by a wooded islet 150 yards offshore. The entrance is obstructed by an islet in midchannel and a rock that shows at low water off its western side, leaving a clear channel less than 100 yards wide on the northeast side of the islet. The anchorage is in about 9 fathoms near the middle. In entering pass southward of the outlying wooded islet.

There is no safe passage inside the group of small islands lying close to the west point at the entrance to Tolstoi Bay, although entering from southeast, between sunken rocks, contracted anchorage will be found for small craft in 9 fathoms.

Chart 8102.—Thorne Bay has its navigable entrance on the north side of a large island obstructing its mouth, 2.5 miles westward of Tolstoi Point. A rock lies close to the northern shore of the channel, northward of the island. Favor the island shore past this point. Thorne Bay is about 0.4 mile wide and extends approximately southwestward for 1.5 miles, with depths of 3 to 8 fathoms. It then divides into two branches, one extending 2.5 miles northwestward, with depths of 8 fathoms, shoaling to 3 fathoms near the head, where an arm, navigable for small craft only at high tide, extends in a northwesterly direction for about 1.5 miles; the other branch extends in a southeasterly direction for about 1 mile, with depths of 7 to 8 fathoms to a point which divides the head of this branch into two coves which are shallow.

The bight southward of the large island in the entrance to Thorne Bay has depths of 8 to 15 fathoms; the channel to it favors the main shore, and rocks extend from the island almost to midchannel. A 12-foot channel leads from the bight to Thorne Bay close to the west shore of the island. The small cove in the north shore of the bay, westward of the island in the entrance, has depths of 2 to 3 fathoms. The foregoing information is based on very meager data from a reconnaissance survey.

Tolstoi Island, about 2 miles northwestward of Tolstoi Point, is low and flat, with a few scrubby trees.

Snug Anchorage lies about 1 mile westward of Tolstoi Island. It is about 1.2 miles long and from 0.1 to 0.2 mile wide. An islet lies in the center of the bight at the head of the anchorage. In entering, pass southward of the islands off the entrance, then favor the western shore to avoid the rock awash, which lies about 300 yards southward of the northern point of the entrance. The channel passes to the westward of the small islets which lie close to the northern shore. Depths of 5 fathoms were obtained in the narrowest part of the channel, and depths of 7 to 25 fathoms were found at the head of the cove. In the small cove eastward of Snug Anchorage, depths of 12 to 15 fathoms were found. A rock lies near the head of this cove. Neither place has been thoroughly surveyed, and irregular depths indicate the necessity for caution.

Forss Cove lies about 1.8 miles north-northwestward from Tolstoi Island. A narrow channel 0.3 mile long in a southerly direction and in places less than 50 yards wide, opens into a bight 0.5 mile long in a westerly direction and 0.2 mile wide, in which there are numerous small islets. The entrance is reported to be foul.

From Forss Cove to Narrow Point there are numerous small bights, exposed to southerly winds, in which there are rocks and small islets.

Narrow Point, about 7.5 miles north-northwestward of Tolstoi Point, shows as a wooded knob just above the wooded shore in its vicinity. **Narrow Point Light (55°47.5′ N., 132°28.5′ W.),** 35 feet above the water, is shown from a small red house on the point.

A small cove, open to the southeastward, is 5.5 miles northwestward of Narrow Point. It is rocky in the northern part.

Chart 8124.—Ratz Harbor, lying about 7 miles north-northwestward of Narrow Point, is a small anchorage but little more than 0.5 mile long and 0.2 mile wide; it affords

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shelter from all winds except from north to northeast, and these probably blow home with some force. Williwaws from the southeast at times strike with great force in this anchorage. The northern point at the entrance is a ledge with an islet near the shore, and two heads, each with a single scrubby tree, near its southeast end all connected at low water. The outer head or islet, is marked by a light 20 feet above the water, shown from a small white house. From the southeast point at the entrance, a ledge covered only at high water, extends 175 yards northwestward with two rocky heads on it. The width of the channel between is about 230 yards.

A careful midchannel course carries in clear. Depths of 5 to 8 fathoms were found at the entrance and 8 to 11 fathoms inside. The usual anchorage is in the middle of the southern part of the harbor. There is a flat in the western indentation of the harbor; otherwise there are no dangers. A log dump with booms and a small float are in the southern part of the harbor. Houses of a logging community are visible on the southwesterly side of the harbor.

Chart 8201.—The shoreline from Ratz Harbor to **Clear Creek,** a distance of 6.3 miles, is practically straight. A small rock, 20 feet high, is 450 yards to the northeastward of the mouth of the creek.

Luck Point, on the west side of Clarence Strait opposite Point Stanhope, is a rounding point without marked features. Here the shoreline turns westward and changes from a steep, rocky formation to a boulder beach about 100 yards wide. About 0.4 mile westward from Luck Point a narrow ledge extends offshore for about 0.3 mile. About 1.2 miles northwestward from Luck Point, rocks, which bare, parallel the beach for a distance of about 1 mile; the outermost is distant about 0.2 mile from the shore.

Etolin Island, on the northeastern side of Clarence Strait near its head, separates Ernest Sound from Stikine Strait. The coast is bold, rocky, and densly wooded, and is broken by numerous inlets and off-lying islands.

Chart 8161.—The Onslow Islands, on the north side at the entrance to Ernest Sound, are five wooded islands and numerous small ones, the largest of which is **Onslow Island,** 3.2 miles long and about 350 feet high.

The western shore of Onslow Island is indented with small bays filled with ledges and rocks. Small rocks and islets extend offshore 0.1 to 0.3 mile. An inlet about 0.5 mile long, opening from the southward and then extending eastward, lies about 1.8 miles from Ernest Point. It is unsurveyed, but it is reported that 8 feet can be carried through the narrow neck near high water, and that 4 fathoms, mud bottom, are obtained within. Rocks, awash, and kelp lie in the entrance, and tide rips extend off the point.

Ernest Point (55°51′ N., 132°22′ W.) is the southernmost point of Onslow Island and is the northwestern point to Ernest Sound. Foul ground extends for 0.5 mile south-southeastward of the point.

Onslow Point consists of two wooded islets with a large bare rock to southeastward; deep water lies close off the point to southwestward. Reefs and foul ground connect Onslow Point with **Eagle Island,** a large wooded island northward of Onslow Point. The cove on the southeast side of Eagle Island is foul. Tide rips form off Onslow Point.

Muffin Islands are a group of four small wooded islands about 0.4 mile eastward of Eagle Island. The channel between Eagle Island and Muffin Islands is clear. Reefs extend offshore about 0.6 mile to the northward and northwestward of the Muffin Islands.

The southeast and eastern shores of **Stones Islands** are foul; rocks extend offshore 0.2 to 0.5 mile. The small bight between the Stones Islands affords shelter for very small craft to the southeastward of the wooded island in the entrance. Anchorage may be obtained in 5 fathoms, mud bottom; the channels leading to it are tortuous. The cove in the northern shore of the larger Stones Island is completely filled by flats. No fresh water was found here.

The channel between Onslow Island and Eagle Island is clear except for reefs which make out from each side of the channel about 1 mile northward from the southern end of Eagle Island. The end of each reef is marked by a rock; the rock on the eastern side of the channel uncovers 8 feet, and the rock on the western side uncovers 6 feet. Midchannel courses are good; when passing between the two rocks, slightly favor the eastern side. The cove on the western side of the channel to the southward of the north end of Eagle Island has depths of 3½ fathoms in the middle and 12 fathoms, mud bottom, at the entrance. Water may be obtained from a small stream at the head.

The channel between Onslow and Stones Islands is irregular, depths of 6 fathoms being found near the southern end. A wooded island lies in the passage with deep water between it and the larger Stones Island. A rock, which bares, lies 0.1 mile off the island, and in passing favor the larger Stones Island. The channel southward of Carlton Island is foul and bares. The passage northward of Carlton Island has depths of 6 to 7 fathoms and from the southward passes eastward of the rock, which uncovers about 8 feet and lies 500 yards eastward of Carlton Island.

A dangerous rock which uncovers about 6 feet lies in midchannel in the passage northward of Stones Islands. Keep Stones Island close aboard about 100 yards distant when this rock is covered. A dangerous ledge, which uncovers, extends more than halfway from Etolin Island toward eastern Stones Island and renders this passage dangerous except at low water.

These channels are small boat passages and are not suitable as anchorage on account of the rocky bottom and the currents, which vary in strength from 2 to 4 knots and often are considerably strengthened by a moderate breeze.

Chart 8124.—Dewey Anchorage, on the northeast side of Clarence Strait opposite Ratz Harbor, can be used as a summer anchorage, but the bottom is irregular and rocky, there are several dangers in the entrance, and the pro-

tection is poor. **Gull Point,** the northwestern extremity of Onslow Island, is the southeast point at the entrance. A sunken rock lies 200 yards off the point, and a reef, bare at lowest tide, lies 0.6 mile southwestward of it. **Carlton Island,** flat and timbered, is the larger island northeastward of Gull Point; a shoal extends 350 yards southwestward from its western end. **Mabel Island,** 0.2 mile in diameter, lies about 0.8 mile northwestward of Gull Point; a reef covered at half tide and without kelp, lies 0.6 mile south-southwestward of the island; a reef bare at half tide lies 0.8 mile northwestward, and a rock bare at half tide lies 0.3 mile southwestward of the reef. **Center Island,** 0.1 mile in diameter, lies midway between Mabel Island and the northern shore; rocky bottom with 4 fathoms lies 0.1 mile southward of Center Island, and there are 4½- to 4¾-fathom patches between the island and the shore northeastward.

Caution.—There may be other dangers which are not charted.

Split Island, small and wooded, lies 0.3 mile to the southward of the southern extremity of **Kelp Point,** the northwest entrance point of Dewey Anchorage. A reef lies close to the eastern end of the island. **Double Island,** small and wooded, lies 0.6 mile to the southward of Kelp Point. A small wooded islet lies 0.1 mile eastward of Double Island, and foul ground extends to the northeastward; the channel between is foul.

To enter Dewey Anchorage from southward, stand in on the line of the east sides of Mabel and Center Islands until abreast Gull Point, and then pass midway between Mabel and Carlton Islands. Anchor 0.4 to 0.5 mile north-northwestward of Carlton Island in 15 to 18 fathoms.

From westward, pass 0.5 mile southward of Double Island and head for the north end of Center Island. When abeam the west end of Mabel Island, proceed with caution to the anchorage. The chart is the guide.

Small craft can find better anchorage 0.5 mile eastward of Carlton Island in 6 to 8 fathoms, hard sand bottom. This anchorage can be entered from westward, passing northward of Carlton Island, or from southeastward, using one of the passages described previously.

Chart 8201.—McHenry Anchorage, about 8 miles northward of Ernest Point, has a clear width of about 700 yards and a length of about 1 mile from Avon Island to a small island at its head. It is sheltered except from westward, and small vessels can anchor in the southeast part of the harbor with shelter from all winds. **Avon Island,** on the north side of the entrance, is small, wooded, and lies close to shore; it should be given a berth of over 200 yards. A reef extends about 400 yards in an easterly direction from the east side of Avon Island. A rock, with a depth of 1¾ fathoms over it, is 0.5 mile westward of Avon Island. **Sand Islet,** with a green bush on it, is close to the southeast point at the entrance; a reef, which bares and shows kelp, extends 0.2 mile northwestward from it, and a shoal extends 250 yards eastward of Sand Islet.

To enter McHenry Anchorage keep Avon Island aboard, distant about 400 yards, and anchor in the middle, with Sand Islet bearing about 198°, in 9 to 12 fathoms; or a small vessel can follow a midchannel course and anchor 250 yards westward of the wooded island in the southeast end of the harbor in 5 to 7 fathoms.

Quartz Rock is the extremity of the reef, awash at high water, about 0.3 mile westward from the point northwestward of McHenry Anchorage.

McHenry Inlet has its entrance 5 miles eastward of Point Stanhope and 2.5 miles northward from McHenry Anchorage. It is horn-shaped, about 4 miles long, and 0.5 to 0.8 mile wide. Foul ground extends about 1.5 miles in a westerly direction from the southeast entrance point. **Range Island,** the small wooded island in midchannel at the entrance, is the most northerly of the group off this point and lies about 0.5 mile to the southwestward of a small rocky islet off the northwestern point of the entrance, with a clear channel between. A 2-fathom spot is 1.2 miles 310° from Range Island. A long narrow ridge, with depths of 6 to 10 fathoms with deep water on each side, is in midchannel, in the direction of the channel, 0.6 mile northeastward of Range Island.

McHenry Islet, a small rocky islet, is 1.6 miles 082° from Range Island. Foul ground extends in a southwesterly direction from this islet for about 0.1 mile, and to the northwestward extends to the north shore of the bay.

Nut Rock is about 700 yards 220° from McHenry Islet. A sunken rock is 550 yards 073° from McHenry Islet.

In entering, pass about 0.1 mile northward of Range Island, then turn between McHenry Islet and Nut Rock, favoring Nut Rock, and follow the trend of the channel favoring the southeastern shore until past the sunken rock northeastward of McHenry Islet; then follow midchannel courses. Anchorage may be had in 12 to 19 fathoms, beyond the turn in the channel. Foul ground extends about 0.3 mile from the head of the bay.

Chart 8160.—Jadski Cove, on the northern side of McHenry Inlet, has its entrance about 1 mile northeastward of Range Island. Depths of 11 and 12 fathoms are found in the bight in the northwest end of the cove, but the approaches are foul.

Burnett Inlet, about 5 miles northeastward of Point Stanhope, extends in a northerly direction for about 7 miles, with an average width of 0.2 mile. **Fawn Island,** wooded, is on the western side of the channel at the entrance. Three small wooded islands and some rocks extend 0.2 mile off the north shore of Fawn Island. The approach to the channel northward of the islands from the westward has not been surveyed. A small wooded islet, with a rock awash 150 yards off its northern end, is 0.3 mile westward of Fawn Island. A 2½-fathom spot is 0.5 mile southeastward of Fawn Island close to the eastern shore. The narrow channel eastward of the shoal is apparently deep but the bottom is irregular.

Rocks extend from 50 to 100 yards off the eastern and southern shores of **Cannery Point,** the western point of the entrance. A reef, bare at low water, marked by a buoy, is about 300 yards off Cannery Point. The channel between it and the point is too narrow for ships to

use. A shoal about 0.2 mile long in a northerly direction is about 0.3 mile eastward of Cannery Point, almost in midchannel. It has two heads; the northwestern, with a depth of 1¼ fathoms, marked by a buoy, is separated by 12-fathom depths from the southeastern head on which 6¼ fathoms were found. The channel between the shoal and the reef to the westward has depths of 26 fathoms.

The small cove behind Cannery Point has depths of 6 to 8 fathoms in the middle, with swinging room of about 150 yards, and is used by fishing craft for an anchorage. There is a float on the eastern side of the cove with ample depths alongside for small craft.

North and **South Burnett Islands** lie close to the eastern shore of Burnett Inlet near the entrance. The passage between the midchannel shoal and South Burnett Island has depths of 19 fathoms. **Deadman Island** lies at the northern end of the bight off the northwestern shore near the entrance. A narrow shoal with depths of 6¼ fathoms lies midway between Deadman Island and North Burnett Island. The channel westward of this shoal has depths of 27 fathoms, but leads over a 5½-fathom spot and probably less water. The channel eastward of this shoal has depths of 24 fathoms.

The inlet, above the narrows, about 3.5 miles above Deadman Island, has not been surveyed. A line of soundings show depths increasing to 67 fathoms, 1 mile from Deadman Island, then decreasing to 9 fathoms near the narrows, 2.5 miles from the head, beyond which no soundings were made. There is reported to be 3 to 5 fathoms through the narrows, which is obstructed by kelp. There is a prominent waterfall on the eastern shore 3 miles from the entrance. The inlet is too deep for secure anchorage. Enter to the southward and eastward of Fawn Island, then proceed between the buoys.

Mosman Inlet, about 4 miles northeastward of Point Stanhope, makes north-northwestward into Etolin Island for about 6 miles, with an average width of about 0.3 mile. This inlet has not been surveyed. There are two rocks on the eastern side about 0.8 mile above **Marble Point**, the eastern point at the entrance. A reef extends from the north end of the islet lying 1 mile north-northwestward of Marble Point to the western shore. This reef obstructs the northern approach to the coves on the western side of the entrance to the inlet.

Cooney Cove is a narrow inlet to the northeastward of Rocky Bay. It is exposed to the southward, the approach is foul, and there are rocks near the head.

Rocky Bay, to the northward of Point Stanhope, is studded with rocky islets and sunken rocks. **Streets Lake** has its outlet in the middle bight at the head of Rocky Bay. A rock with ½ fathom on it is 2.5 miles 060° from Point Stanhope.

Point Stanhope is the southern extremity of a group of islands. A rock with a depth of 1 fathom over it (Chart 8201), marked by a buoy, is 0.8 mile southward of the point. There are several available passages among these islands for small craft bound for Rocky Bay. **Three Way Passage**, having its entrance about 1.5 miles northwestward of Point Stanhope, is the best. It has a depth of 5 fathoms, is narrow, leads close to several dangers, and local knowledge is desirable for its safe navigation.

Anchorage may be obtained by small craft drawing less than 4 feet in the channel just eastward of Three Way Passage. The widest part of the channel is about 150 yards and is entered by way of Three Way Passage. There is an anchorage for very small craft in the cove, 2.6 miles northwestward from Point Stanhope. The channel which leads from the head of the cove to Rocky Bay bares in spots and is suitable only for boats drawing 2 or 3 feet, with local knowledge and making passage at high water only.

The Etolin Island shore from Point Stanhope to Point Harrington, a distance of about 10.5 miles, is rocky and generally foul. A fringe of islands parallel the coast, about 0.5 mile off, almost to Point Harrington. It comprises **Abraham Islands, Screen Islands, Marsh Island,** and **Steamer Rock,** a wooded islet about 100 feet high, off the southern end of which is a ledge which terminates in a rock 12 feet high. It is advisable for vessels in navigating the strait to give the shore a berth of at least 1.5 miles and pass westward of Lincoln Rock West Light. The passage eastward of the islands may be used by small craft. The known dangers are shown on the chart.

Lincoln Rock Light (56°03.5′ N., 132°41.3′ W.), 52 feet above the water, is shown from a white square tower on dwelling on an islet 0.21 mile 62° from Lincoln Rock. A fog signal is sounded at the light. **Lincoln Rock West Light,** 58 feet above the water, is shown from a white square pyramidal tower on a concrete base on **Lincoln Rock.**

Abraham Islands are 0.6 mile off the west shore of Etolin Island. The largest island is 150 feet high and wooded.

Johnson Cove, to the eastward of the northern end of Screen Islands, offers anchorage for four or five small craft of less than 4-foot draft to those with local knowledge. Strangers should not attempt entrance. Swinging room is limited by ledges on the northwestern side of the cove and shoal water toward its head. Several islands are off the entrance. The cove is entered southward of the rock, awash, 150 yards off the southeast end of the large island near the entrance and eastward of the rock, awash at high water in midchannel at the entrance. Fresh water may be obtained from streams which empty into the cove. There is a small float in the cove and a number of houses on the shore.

Chart 8164.—Steamer Bay, eastward of **Point Harrington,** affords anchorage at its head, but the holding ground is not good and southeast winds draw with considerable force through **Porcupine Creek.** It is open to northwestward. The bay is 1 mile wide at its entrance, gradually contracting near its head to less than 0.2 mile, then again widening into a basin 0.3 mile in diameter, into which Porcupine Creek empties. For a distance of 1.2 miles from Point Harrington both shores of the bay have some rocks close inshore.

Local magnetic disturbance.—Differences of as much as 3° from the normal variation have been observed at Point Harrington.

The bay is easy of access, a midchannel course leading fair into the inner basin. The best anchorage is probably near the middle of the basin, favoring the eastern shore, in about 16 fathoms. Small craft may find better bottom by anchoring in 6 fathoms close to the eastern shore, just past a cabin on the beach and southward of **Independence Island,** a bare rock 3 feet high, which lies near the shore on the northeast side of the basin.

Mariposa Rock, with 3¼ fathoms over it and marked by a buoy, is 0.6 mile 312° from Point Harrington.

The deep cove 2 miles north of Point Harrington, locally called **Kindergarden Bay,** is used extensively as anchorage for small craft. It is one of the best anchorages in the area and affords protection in all weather. Enter midchannel, passing south of the small wooded islet, and anchor in 5 to 7 fathoms, soft bottom.

Chart 8160.—Steamer Point, 3 miles northward of Point Harrington, is bold, steep, and heavily wooded. Deep water extends close to the point. A light, 30 feet above the water and shown from a small red house, is on a small wooded islet close to the point northward of Steamer Point.

Kashevarof Passage and Snow Passage form the head of Clarence Strait and are the two passages connecting with Sumner Strait westward of Zarembo Island. Kashevarof Passage is wide but is beset with rocks, reefs, and shoals, with strong tidal currents and tide rips. All known dangers in the pass are charted and the pass is extensively used by small craft. Large vessels use Snow Passage which is clear and marked by lights, and a lighted buoy.

For daily predictions of the tidal current in the passages, see the Tidal Current Tables.

Chart 8162.—A cove, about 3.5 miles northwestward from Luck Point, is noticeable for its low-water area at the head, and a sand beach about 300 yards wide. A rock bare at half tide, is in the middle of the cove, and some rocks are on the edge of the sand flat westward of midchannel. A rock, which bares, is 0.4 mile northwestward from the eastern point of the entrance, and rocks, which bares are about 0.2 mile offshore from the east point of the entrance for about 0.5 mile to the eastward.

Coffman Cove is on the western side of Clarence Strait about 5 miles west-southwestward of Lincoln Rock Light. The western half of the cove is filled with rocks, some of which bare. Good anchorage for small craft may be had in the middle of the southeastern part of the cove in 10 to 15 fathoms, mud bottom, and a midchannel course will carry in safely. A flat extends about 0.2 mile from the southeast end of the cove.

Lake Bay is on the southern side of Kashevarof Passage between **Stevenson Island** and **Coffman Island.** Across the entrance and in the bay are detached islands and reefs and the best channel is from northeastward, between Beck and Coffman Islands.

Beck Island, small and wooded, is about 0.8 mile northwestward of Coffman Island. **Beck Island Light (56°02.8′ N., 132°51.7′ W.),** 20 feet above the water and shown from a small white house on the south side of the island, marks the southeastern entrance to Kashevarof Passage.

Gull Rock and **Barnacle Rock,** awash at highest tides, lie about 0.6 mile south-southwestward and westward, respectively, from Beck Island; they should be given a berth of over 300 yards. There are also extensive sunken reefs betwen Beck Island and **Bush Rock.** The latter is 0.6 mile off Stevenson Island, is 35 feet high, and has bushes on top.

Abreast **Keg Point** on Stevenson Island the channel is about 250 yards wide between an extensive shoal which makes out from the eastern shore and a shoal projecting out 175 yards from Keg Point. There is good anchorage inside the constricted entrance for large or small craft in 6 to 15 fathoms, soft bottom. An occupied cabin is on the east shore of the entrance to **Lake Bay Creek.**

Chart 8160.—Point Barnes, the northeastern extremity of Stevenson Island, is low and wooded, without characteristics of interest to the navigator.

Lake Barnes is a salt water lake of considerable extent lying southwest of Stevenson Island. It has two outlets through which strong currents flow during changes of tide. Small craft up to 10-foot draft may enter into the lake on high water slack, passing through **Indian Creek,** the westerly of the two entrances. This passage has submerged dangers and must be navigated with extreme caution. It has a least depth of 6 feet in midchannel.

On high water small boats with outboards go from Lake Barnes through **Gold and Galligan Lagoon** into large inner **Sweetwater Lake** (Chart 8201).

Whale Passage leads south and westward of Thorne Island. Midchannel courses through the contricted areas are easily followed and clear all known dangers. The passage is used extensively by fishermen and trappers.

Caution.—Uncharted rocks and shoals have been reported in Whale Passage. Mariners should exercise caution when navigating in this area.

Shelter for small craft may be found on the north side of the passage near its south entrance, in the small cove just after passing between the two charted rocks directly off a small cabin near the beach in 5 fathoms, soft bottom. The bay which extends to the northwest near the middle of the passage affords good anchorage with ample swinging room in 4 to 10 fathoms, soft bottom. An excellent anchorage for small craft in all weather may be found when headed north from the middle of the passage, on the eastern side between the irregularly shaped wooded island and the shore of Thorne Island. Enter around the northern end of the wooded island and north of the charted rock, pass south along the eastern

side of the island, keeping a charted rock on the starboard side, and come to anchor in 4 to 5 fathoms of water, soft bottom, off the southeastern tip of the small island and a cabin on the shore of Thorne Island.

Kashevarof Islands, on the northeast side of Kashevarof Passage, are low and wooded, though there are many bare rocks. There are many passages between the islands but all are beset with rocks and reefs and require local knowledge for safe navigation.

The **Blashke Islands** form a group of islands at the southeast end of the Kashevarof group. All are wooded and separated by narrow foul channels. **Rose Rock, Rose Island, Seal Rock, The Triplets,** and **Deichman Rock** lie on the foul ground to the southeastward.

The islets and bays at the northwestern end of Kashevarof Passage are described with Snow Passage following.

The currents at the northwest end of Kashevarof Passage are similar to those of Snow Passage, but their velocity is considerably less.

The main channel, leading between Beck Island and The Triplets and as far west as **West Island,** has been examined and the dangers are shown on the charts. The section from West Island to Fire and Echo Islands has many dangers and has not been closely examined, but there is an apparently clear channel leading from the southern end of West Island.

Exchange Cove, on the northwestern side of Kashevarof Passage, is about 0.2 mile wide and 1 mile long, and is the largest sheltered anchorage in this vicinity. It has room for several small vessels and is well protected from all directions. The depths are 10 fathoms at the entrance, shoaling gradually toward the head. **Exchange Island** forms the eastern shore of the northern part of the cove.

West Island should be left about 0.5 mile to the eastward to avoid a 2¾-fathom spot. Pass midway between West Island and the small sparsely wooded islet which lies almost in midchannel to the westward of West Island; thence about 0.2 mile to the eastward of the small rocky wooded islet which lies about 0.8 mile eastward of the south end of Exchange Island; thence in midchannel between Exchange Island and the small double island to the northward; thence in midchannel to westward of Fire Island; thence between Tide and Bushy Islands, or Rookery and Tide Islands.

There is a channel to the eastward of **Fire Island** and between it and **Echo Island** which is a small wooded island about 150 feet high with foul shores; the channel to the westward is preferred. The channel to the southward of **Shrubby Island** is used by small craft. In making the passage kelp should be avoided at all times. The bottom is very irregular and the channel has not been wire-dragged. The channel between **East** and **Middle Islands** is used by small boats.

There is a channel eastward from 0.9 mile north of the northern end of West Island south of the small wooded island with the two islets to the eastward being left to the northward; thence midchannel between Shrubby Island and the most northerly of the Middle Islands. Follow the shore of the Middle Islands about 0.4 mile off and south of the larger wooded island nearest Shrubby Island.

On the south side of the last described channel, between the 240-foot island and the larger island southeast of it, is a shelter for small craft in all weather. The entrance passes over a 1-fathom depth to anchorage in 2½ fathoms off a float and house.

Key Reef is an extensive reef lying about 1.8 miles from the Kashevarof Islands. The northern end of the reef, about 3.5 miles westward of Point Harrington, usually shows at high water as two rocks about 5 feet high and about 100 yards long, but they are awash at extreme high tides. **Key Reef Light (56°09.6′ N., 132°49.8′ W.),** 35 feet above the water and shown from a small white house on a truncated concrete pyramid, is near the northern end of the reef. A number of low water rocks are near Key Reef, one lying 0.8 mile southeastward uncovers 12 feet.

Bluff Island is a small wooded island about 1.8 miles to the westward of Key Reef. Reefs extend about 200 yards from the northwest and southeast ends of the island. The eastern and western shores are clear.

Zarembo Island, heavily wooded, is at the head of Clarence Strait. A rather low valley extends east and west across the island. The shoreline is rocky, with off-lying rocks and reefs, except along the eastern shore.

Point Nesbitt, the southern point of Zarembo Island, is low, rising to high ground inshore.

Nesbitt Reef is a dangerous reef extending 0.8 mile southward from Point Nesbitt. Near the outer end of the reef is a rock that uncovers 12 feet. There are rocks which bare a short distance outside it and a string of rocks between it and the shore, which covers at various stages of the tide. The tidal currents have considerable velocity in its vicinity, and care should be taken, especially in foggy weather. Shoals with 5½ fathoms over them are eastward of the reef. A light 27 feet above water, shown from a skeleton tower on a concrete pier is on the southern end of Nesbitt Reef.

From Point Nesbitt to **Macnamara Point,** a low wooded point marked by a daybeacon, a distance of 9 miles, ledges extend offshore in places about 0.3 mile, nearly all of which bare. Those abreast the bare rocks close to the middle of the east side of Bushy Island are always covered and are marked by kelp at slack water. Rocks extend about 0.5 mile southward from Macnamara Point. At night, deep shadows are cast by the high land inshore, and the daybeacon cannot always be readily picked up.

From Macnamara Point to St. John Harbor the shore is fringed with ledges to a distance of 0.5 mile in places, with broken ground farther out, and this shore should be given a berth of 1 mile or more.

Snow Passage is between **Bushy Island,** the northernmost of the Kashevarof group, and Zarembo Island. It is a deep channel with foul shores and strong tidal currents. Snow Passage is largely used by vessels bound from or to Wrangell Narrows or between Clarence and Sumner Straits, and not desiring to touch at Wrangell,

as it is shorter than the route through Stikine Strait. It is clear in midchannel, except for a shoal with a depth of 4½ fathoms in the middle of the channel at the north end, northeastward of Rookery Islands. The shoals in Snow Passage are clearly marked by kelp at slack water. During spring tides a considerable number of drifting logs may be encountered in the passage of a size dangerous to vessels.

Bushy Island Light (56°16.6′ N., 132°57.5′ W.), 22 feet above the water and shown from a small white house on a brown cylindrical base, is on a rock off the northeast end of Bushy Island, and marks Snow Passage. From points to the northwestward the light appears well off the Bushy Island shore.

A lighted buoy is about 0.7 mile eastward from Bushy Island Light. It marks the eastern side of the channel close to a kelp patch near the edge of which are two rocks covered at half tide.

A fish buyer's scow is anchored each summer in the small cove on the north shore of Bushy Island and south of the small islet. Halibut and salmon are purchased and all necessary supplies for fishermen, including food, clothing, gasoline, fuel, and diesel oil may be obtained.

Excellent anchorage may be had west of Bushy Island in 15 to 20 fathoms, with Tide Islet bearing 209°, distant 1 mile. This anchorage is protected from all but winds from the northwest.

The currents of Snow Passage somewhat resemble those of Seymour and Sergius Narrows in their peculiarities. The flood or southeasterly current has a velocity of 3 to 5 knots and the ebb or northwesterly current 4 to 6 knots in the narrowest part of the passage. Swirls of some severity at times, occur from abreast Ossipee Channel to the north end of Bushy Island; westward of the last named point they are very much lessened. For predicted times and velocities of the current, see the Tidal Current Tables.

Ossipee Channel is between Shrubby and Bushy Islands. An examination by means of the lead indicates a clear channel. Thick kelp and ledges line the channel on both sides, but the midchannel is apparently clear.

The current sets fair with the channel in Ossipee Channel. When the current runs north in Snow Passage, its direction in Ossipee Channel is west, and vice versa.

Tide Islet, small and wooded, is about 2.2 miles westward of Bushy Island. Rocks, marked by kelp and bare at low water, lie to the southeastward and southwestward, close-to.

Rookery Islands, two in number, and wooded, lie in midchannel near the northwest end of the passage and 1.8 miles southwestward of Macnamara Point. Between the islands are a bare rock and ledges that cover, and close westward of western Rookery Island are two islets, each having a clump of trees. A light, 40 feet above the water, is shown from a small white house on the northeastern side of the easternmost island of the group.

Salmon Bay is about 1.2 miles westward of Rookery Islands. Small craft can find sheltered anchorage in 1 to 3 fathoms near the head. It is extensively used as a harbor by local boats during certain seasons of the year.

A line of detached rocks 1.2 miles long, bare at different stages of the tide and marked by kelp at slack water, lies about midway between Rookery Islands and Point Colpoys and from 0.2 to 0.6 mile offshore. A daybeacon is on a rock at the northwesterly end, 0.7 mile northeastward of Bay Point. The channel leading along the shore westward of them appears to be clear.

The bays and coves to the southward of Salmon Bay are nearly dry at low water and have foul entrances. They lead into a salt marsh which parallels the beach. Overfalls, currents, and rocks make the various entrances dangerous except at high water. It is reported that at extreme high water boats drawing 5 feet make the passage from Salmon Bay to the first bay to the southward through the salt marsh.

Point Colpoys, about 4.5 miles westward of Macnamara Point, is low and wooded, and is marked by **Point Colpoys Light (56°20.2′ N., 133°11.8′ W.)**, 15 feet above the water and shown from a small white house. Irregular bottom extends about 0.3 mile to the northward.

Bay Point is a low wooded point, about 1 mile to the southeastward of Point Colpoys.

Chart 8201.—Ernest Sound and Stikine Strait, with their connecting passages, Zimovia Strait, Blake Channel, and Eastern Passage, afford various routes from Clarence Strait to Wrangell. Large vessels go by way of Stikine Strait, but small craft frequently go by way of Ernest Sound and Zimovia Strait, or by Ernest Sound, Blake Channel, and Eastern Passage, these last two routes affording better protection in stormy weather. The distances to Wrangell by these routes from a point 2 miles westward of Lemesurier Point are about 52, 50, and 60 miles, respectively.

Chart 8161.—**Ernest Sound** is the large body of water which opens from Clarence Strait between Lemesurier Point and Onslow Point, with a width of about 4 miles between the points. Its general direction is north-northeastward for 25 miles to Point Warde; from this point, under the name of Bradfield Canal, it extends 17 miles in a general easterly direction, with a width of about 1 mile. There are numerous small islands in the sound and two large ones, one on each side, about midway of its length.

From Ernest Sound two arms extend north-northwestward, and joining near the mouth of Stikine River, inclose Wrangell Island. The western arm is called Zimovia Strait. The southern part of the eastern arm is called Blake Channel and the northern part Eastern Passage. A passage to Wrangell through Ernest Sound, Blake Channel, and Eastern Passage is practicable, and is sometimes used. Small craft use Zimovia Strait frequently.

The principal dangers in the main part of Ernest Sound are McHenry Ledge, with a depth of ¼ fathom, marked by a lighted bell buoy, and a 3-fathom rock off the en-

trance to Union Bay, marked by a buoy. To keep in the middle of the channel between Eaton Point and the north end of Deer Island, vessels should pass 0.6 mile westward of Eaton Point, 1.2 miles westward of Point Peters, in midchannel between Deer and Niblack Islands, and 0.6 mile westward of the north end of Deer Island.

Lemesurier Point, Lemly Rocks, McHenry Ledge, the Onslow Group, on the north side of the entrance to Ernest Sound, together with Ernest Point, Onslow Point, and the passage leading from Ernest Sound to Dewey Anchorage, have been described with Clarence Strait earlier in this chapter.

Currents.—The currents in Ernest Sound follow the general direction of the channel. The flood current sets northward with a velocity of 2 to 3 knots. The ebb current sets southward with a slightly stronger velocity. At the junction of Bradfield Canal and Blake Channel, the joining of the tidal currents cause swirls. For daily predictions, see the Tidal Current Tables.

Chart 8124.—Union Bay is eastward of Lemesurier Point. At its head is a large lagoon, mostly bare, into which a large stream, **Black Bear Creek,** empties. The waters of the bay are deep, but there is anchorage with protection from southward, on the east side of the head of the bay, in about 18 fathoms. The southwest angle of the bay is foul for 0.2 mile offshore. The only danger, except near the shores, is a rock with a depth of 3 fathoms marked by a buoy, in the middle of the entrance and 3.4 miles 030° from Lemly Rocks. At high water do not approach the head of the bay too rapidly; as the points at the entrance to the lagoon are platforms of rock only 3 feet above high water and are not readily distinguished. Anchor in 18 fathoms, about 0.4 mile offshore, on the east side of the head of the bay, with the northeast point at the entrance to the lagoon bearing about 140°.

There is a wharf in Union Bay about midway between Union Point and the head of the bay. It has a 130-foot face with a least depth of 30 feet alongside. The mailboat stops here each week.

Fishermen use the cove behind the small islet 0.5 mile northward of the wharf and the long chuck 1.5 miles northward of the wharf for anchorage.

Small boats use the channel between **Union Point,** which is low and wooded, and the two islets southward of it.

An estimated current velocity of 3 knots sets southward around Union Point on the ebb.

Local magnetic disturbance.—Differences of as much as 10° from the normal variation have been observed in the eastern part of Union Bay, and a difference of 38° from normal variation has been observed at a small islet 0.8 mile southwest of Union Point.

Vixen Harbor, 0.8 mile eastward of Union Point, is about 0.4 mile long, with an even sand and mud bottom and an average depth of 4½ fathoms. The entrance channel, about 100 yards wide, has depths of only 2 fathoms. In entering proceed carefully to the northward of and close to the small islands in the entrance. Temporary anchorage for larger craft may be had in 16 fathoms, sand and gravel, 0.4 mile northward of the small island in the entrance.

Chart 8161.—Vixen Inlet, about 6.5 miles northeastward of Lemesurier Point, has a small islet, **Sunshine Island,** in the middle of the entrance and a stream at the head. A reef makes out about 0.2 mile from the south shore at **Vixen Point.** A reef extends about 0.3 mile southwestward from the point to the southward of Vixen Point. A reef with a least depth of ¾ fathom, not marked by kelp, is in the middle of the entrance, 1.2 miles 284° from Sunshine Island.

In entering, the passage to the southward of Sunshine Island is preferable. Round the southern end at a distance of about 250 yards and select anchorage in depths of 11 to 14 fathoms. The inlet dries for a considerable distance from the head of the flats, dropping off sharply to 7 fathoms.

Emerald Bay, open and exposed, is 2.8 miles northward of Vixen Point. It is used by fishermen during easterly weather, but is a poor anchorage. A stream empties at its head.

Easterly Island, a small timbered island, is in midchannel, about 2.8 miles northward of Vixen Point. It has sheer steep sides.

Petersen Islands, separated by a narrow channel with a depth of 3 fathoms and having the appearance of a split island, are about 3 miles southward of Brownson Island.

Westerly Island, small and wooded, is about 1 mile southward of Brownson Island. The channel between it and Brownson Island is clear, except for the rocks northward of Petersen Islands.

Brownson Island, on the west side of Ernest Sound 7 miles northeastward of Onslow Point, is cut almost in two by a large lagoon. A group of small islands is separated from the southern end of the island by a channel about 0.1 mile wide, suitable for launches, which also find anchorage there.

An island, small and wooded, is 0.5 mile eastward of the southern end of Brownson Island. A rock, awash at extreme high tide, is about 0.2 mile eastward of the north end of the island. About 0.2 mile eastward of the rock is a cluster of rocks, which bare about 5 feet, and are marked by a daybeacon. These constitute a danger. In navigating this section of Ernest Sound, Eaton Point on the Cleveland Peninsula shore, should be favored.

A small, narrow island, with rocks off its north and south ends, lies close to the eastern shore of Brownson Island, near the southern end. The channel separating the two is used by launches, the deeper water being westward of the rock off the point northward of the middle of the island.

Canoe Passage separates Brownson Island from Etolin Island. It runs in a northerly direction, with depths too great for anchorage, until the narrows are reached 2 miles from the northern end, where the channel dries and in places is 100 yards wide. Pass eastward of a small

islet at the north end of the narrows. A shoal makes out about 150 yards from the west shore, 0.4 mile southward of the north end of the passage. Beyond this point midchannel depths are the greatest. At the north end of Brownson Island, the passage turns eastward, increases in width, and affords anchorage in 13 fathoms, sand bottom.

Deer Island, northeastward of Brownson Island, is on the eastern side of Ernest Sound. There are a number of islands and rocks close to the western shore of the island.

The western shores of a cove are formed by two islands off the western side of the southern end of Deer Island. Depths in the cove range from 10 to 17 fathoms in the narrowest part of the entrance and 24 to 39 fathoms inside. Rocks extend about 0.1 mile off the eastern point of the entrance. There is a narrow small-boat passage between the two islands and between the northern island and Deer Island. In the western shore of Deer Island, 2 miles northward of Point Peters, the cove has depths of 8 to 38 fathoms. Rocks lie 0.5 mile inside the entrance, 0.1 mile from the western shore. The channel leading northwestward from the northwest end of the cove bares in places. This channel and the channels between the islands close to the western shore of Deer Island are suitable for small boats only.

Point Peters (55°58.5′ N., 132°01.8′ W.), is the southern point of Deer Island. A 3½-fathom spot is 0.2 mile northward of **Kuakan Point,** the northern point of the island, and a small cove too deep for anchorage lies southeastward of the point.

Seward Passage, deep and clear, separates Deer Island from the mainland. **Watkins Point,** the southern point of the southern entrance, is low and timbered. **Sunny Bay** and the small coves between Watkins Point and **Point Santa Anna** are used by launches. A group of islands lie off the western end of Sunny Bay, the outermost of which, **Change Island,** is timbered.

Santa Anna Inlet is on the east side of Seward Passage about 3 miles eastward of Point Peters. A shoal area extends about 200 yards off the southwestern shore about 0.8 mile from the entrance. From a mile within the entrance the midchannel depths decrease gradually from 18 to 9 fathoms near the head. Small craft will find good anchorage in 9 fathoms at the head of the inlet.

Frosty Bay is on the east side of Seward Passage near the north end. Two rocks, bare at half tide, lie about 150 yards northward of the south point of the entrance. Fishing craft anchor in 6 fathoms in the southwest part of the bay. The head of the bay narrows, then widens, forming a bight with depths less than 1 fathom. A large stream empties at the head of the bay.

Niblack Islands are a cluster of small islands lying between Brownson and Deer Islands. The passage on the eastern side is deep and clear.

Bold Island, with a conspicuous cliff 100 feet high on the west shore, lies at the entrance to Menefee Inlet. A channel with a depth of 15 fathoms separates Bold Island from a group of small islands to the southward.

Menefee Inlet, on the west side of Ernest Sound, is deep to within a mile of the head, where three fair-sized streams empty. Anchorage may be had 1.2 miles from the head of the inlet in 14 fathoms, sand and mud bottom.

Fisherman Chuck separates **Menefee Point,** the low wooded point on the south side of Menefee Inlet, from Etolin Island. It is from 30 to 100 yards in width, has a depth of 14 fathoms at the northern entrance, shoals to 2 fathoms 0.3 mile to the southward, and thence to the southern end is dry except at high water. It is used as an anchorage by fishermen.

Southwest Cove, to the northward of Bold Island, is too deep for anchorage. A reef extends offshore about 100 yards from a point at the head of the cove. Very small craft find anchorage back of the island on the east side of the cove.

Found Island, at the southern entrance to Zimovia Strait, is rectangular in shape and wooded, with ledges extending about 100 yards off the northern shore. A grass-covered rock, 12 feet high, lies 0.2 mile westward of the north end of the island. A rock, which bares 1 foot and marked by a daybeacon, is 0.4 mile northward of Found Island. **Blanche Rock,** 7 feet high, off the south point of the entrance to Zimovia Strait, is conspicuous on account of its white color.

Southeast Cove, about 1.5 miles northeastward of Found Island does not afford anchorage.

Fools Inlet is about 5 miles northeastward of Found Island. Mud flats bare 0.9 mile from its head, almost to two small islets. Anchorage may be had in 14 to 19 fathoms southward of the southern islet.

Point Warde to the southeastward of Fools Inlet, the southern point at the entrance to Bradfield Canal, rises to two, not very definite timbered knobs, with higher land to the eastward. The shore is rocky. Cliffs on the western face of the point average 80 feet in height.

Foul ground extends about 75 yards off the northern shore of the cove, 1 mile southward of Point Warde. The cove has depths of 23 to 30 fathoms in the middle. It shoals gradually to the northern shore. In the small bight on the northern side of the cove, depths range from 6 to 9 fathoms.

Bradfield Canal is apparently free of dangers. About 12 miles from Point Warde, the canal is nearly closed by **Duck Point** which is wooded. The small cove west of the point affords the best protection for small craft in the canal. The best anchorage is at the head of the cove in depths of 5 to 8 fathoms, soft bottom.

The navigable channel of Bradfield Canal above Duck Point follows the north shore of the point, being restricted in one place to a width of 0.2 mile by a small islet which is passed on its south side. Beyond the point the canal continues 2 miles, where it ends in a broad flat off the mouths of two large streams.

Anan Bay is an open bight on the south shore of Bradfield Canal. A large salmon stream empties into Anan Bay which offers a good shelter and anchorage for small craft during southerly weather in 5 to 10 fathoms, mud bottom. There are no known dangers other than those charted. The United States Forest Service maintains a bear observatory on **Anan Creek** at the large waterfall

about 0.5 mile from the beach. A trail marker on the beach indicates the end of a well-maintained trail leading inland along the creek and passing the bear observatory. This area is visited each year by many people who come to observe the thousands of salmon in the stream and passing up the falls also the many black bear feeding on the salmon.

Zimovia Strait, between Etolin Island and Wrangell Island, connects Ernest Sound with the east end of Sumner Strait. It is about 25 miles long, varied in width from 0.5 to 2.5 miles, and furnishes a convenient route for small vessels bound from Ketchikan to Wrangell. The critical part of the passage is in **The Narrows,** in the vicinity of Button Island, where the channel is tortuous but is marked by buoys, daybeacons, and lights.

Currents.—The flood current enters Zimovia Strait from both the northern and southern ends and meets near Village Islands. The approximate velocity of the current is 2 knots. Between Woronkofski and Wrangell Islands, the ebb sets southward and out through Chichagof Pass with a velocity of about 3 knots and the flood sets northward with a velocity of about 2 knots. For daily predictions, see the Tidal Current Tables.

The channel in places is narrow and intricate, the depths are irregular, and local knowledge is desirable for safe navigation.

A small cove on the Etolin Island side of the channel, about 1.4 miles from the southern entrance, has depths of 18 fathoms 0.3 mile from the head, shoaling to 11 fathoms at the head.

Thoms Place, a cove on the Wrangell Island side of the channel, 3.5 miles from the southern entrance, has two small wooded islets in the entrance and near the head a group of islets close to the southwest shore and another close to the northeast shore.

In entering, pass between the entrance islets, where soundings of 10 fathoms were obtained. The channel between the eastern islet and the Wrangell Island shore is foul. The head of the bay is foul. A wooded island about 0.2 mile in diameter is 0.2 mile off the headland on the west side of the entrance to Thoms Place.

A lagoon, about 0.8 mile long, lies westward of Thoms Place. Rocks lie off the entrance, and the channel is narrow, with a controlling depth of ½ fathom. A small bight just inside the entrance has depths of 6 to 10 fathoms. There are several smooth beaches which have been used for beaching boats. The head of the lagoon is foul.

Zimovia Islets, about 6 miles from the southern entrance to the strait, are a group of low wooded islands, the largest and highest of which has an elevation of 268 feet. A light is shown from a small white house on an islet off the western end of the largest island of the group.

Trap Rock, a shoal of sand and boulders, which bares 1 foot, lies 0.5 mile eastward of the entrance to Whaletail Cove. A buoy is 100 yards eastward of the rock. Foul ground is between the rock and the Etolin Island shore.

A small islet, 125 feet high, lies about 0.4 mile northward from Trap Rock. Small vessels anchor in the vicinity.

Whaletail Cove, westward of Trap Rock, has two branches; the entrance has depths of about 1 foot. The western branch, which dries almost entirely, has a small island at its entrance. Depths of 1 to 8 fathoms are found in the eastern branch, the greater depths being near the southern shore. This branch shoals rapidly near the head.

Button Island, 160 feet high and wooded, lies near the northern end of a shoal area that extends between the island and **Whaletail Point.** A buoy about 160 yards eastward of Button Island marks the northern edge of the shoal area. A wooded island lies about 0.2 mile southward of Button Island. The controlling depth across that part of the shoal area between these two islands is ¾ fathom and it is obstructed by kelp.

A light, shown from a small white house, is on the Wrangell Island shore 0.2 mile northward of Button Island.

Double Rock, which uncovers 11 feet and marked by a daybeacon, is close to the Wrangell Island shore about 0.2 mile westward of the light. A rock, with ¾ fathom over it and marked on its south side by a buoy, is about 0.3 mile southward of Double Rock.

Midchannel Rock, which uncovers 3 feet and is marked by a daybeacon, lies 0.4 mile westward of Double Rock. A deserted Indian village is on the point about 0.3 mile northwestward of Midchannel Rock.

Village Islands, a group of islands, rocks, and ledges which are part of a general shoal area extending 2.5 miles northwestward from the western end of Whaletail Point, are about 0.4 mile off the northeastern shore of the strait, with the main channel between.

Village Islands Light (56°12.8′ N., 132°18.0′ W.), is shown from a small white house on a rock off the northeastern shore of the largest island of the group.

Village Rock, marked by a daybeacon, is on the northeastern edge of the channel about 0.3 mile from Village Islands Light.

Village Islands Rock, awash and marked by a daybeacon, lies about 0.6 mile northwestward of Village Islands Light and marks the northwestern end of the general shoal area, at the western end of The Narrows.

Olive Cove is southward of the Village Islands. A stream of considerable size empties through the flats, which at low water, extends 0.5 mile from the head of the cove. With local knowledge anchorage may be had off the entrance in 10 to 15 fathoms. Just inside the northwest entrance point is a small private float with a reported depth of 8 feet.

A small cove, which dries, is about 0.7 mile eastward of Olive Cove. Foul ground extends about 700 yards offshore between Whaletail Point and the cove. The two coves are best approached from northwestward.

Chart 8160.—Anita Bay, on the west side of Zimovia Strait, about 10 miles from the north entrance, is deep and clear inshore on both sides, except for a shoal ex-

tending eastward about 0.2 mile from the point of the cove on the south side of the bay, 3 miles from the entrance. Shoals extend about 0.1 mile off the entrances to small coves, one on each side, about 0.6 mile from the head of the bay. A depth of 10 fathoms may be obtained 0.2 mile from the head of the bay, but beyond this it shoals rapidly. **Anita Point,** the southern point of the entrance, rounded, wooded, and indefinite, may be passed at a distance of 0.2 mile. The bight in the northwest shore of the bay near the entrance dries about 50 yards offshore. A group of rocks lies in the entrance to the bight in the western shore 1 mile westward from Anita Point. A cabin is on the north shore of the bight. Anchorage may be had near the head of the bay in 13 to 17 fathoms, mud and sand bottom, with swinging room somewhat restricted by flats which make out from the head and sides of the bay.

Turn Island lies close to the Wrangell Island shore northeastward from Anita Point. **Nemo Point** lies about 2.8 miles northward of Turn Island.

The eastern shore of Zimovia Strait, between 2 and 5 miles above Nemo Point, is foul with rocks and islets which extend for 0.5 mile offshore. **Young Rock,** with a depth of 2 fathoms and not marked by kelp, lies in the center of the strait at its junction with Chichagof Pass.

Chart 8161.—Blake Channel, having its entrance 3 miles northeastward of Point Warde, connects Ernest Sound with **Eastern Passage** and through it with the eastern end of Sumner Strait. Due to deposit from the Stikine River, shoaling at the north end of Eastern Passage has progressed southward. From **Gerard Point** the shoal extends southeastward for about 0.5 mile to and beyond the next small creek. The current from the South Arm of the river is diverted through the channel off Green Point (Chart 8201). The deep-water passage north of Highfield Anchorage has been narrowed to a width of about 0.5 mile by the encroachment of the shoaling from sedimentation on its northern side. It is recommended that ships using Eastern Passage favor Simonof Island, passing a safe distance off.

Currents.—In Blake Channel the flood current sets north-northwestward with a velocity of about 3 knots, and meets the flood current from Eastern Passage in the vicinity of The Narrows. The ebb current sets in the opposite direction with a velocity of about 3 knots.

In Eastern Passage the flood current sets southward with a velocity of about 3 knots. From the vicinity of The Narrows, the ebb current sets both ways, northward through Eastern Passage, and southward through Blake Channel, with a velocity of about 3 knots. The first and last of the ebb is backed into Eastern Passage by the current from the Stikine River. For daily predictions, see the Tidal Current Tables.

Blake Island is at the southern entrance, with a narrow channel on each side. A pinnacle rock, not marked by kelp, with a depth of 1¼ fathoms, is near the entrance to Blake Channel on the east side of Blake Island, about 0.1 mile from the Blake Island shore. A 5-fathom spot is westward of Blake Island near the entrance about 150 yards from the Wrangell Island shore. If the western channel is used, avoid the rocks off the point of the cove on the western side of the channel when turning in from Bradfield Canal.

The channel eastward of Blake Island, passes eastward of a reef extending northwestward from the northwestern end of Blake Island and which terminates in a wooded islet at the narrowest part of the channel. A midchannel course will avoid the rocks along the east side of Blake Island. The tidal currents have considerable velocity in this vicinity, and a midchannel course should be followed through either channel.

Neptune Island, about 7 miles north-northwestward of Blake Island, is low and wooded. The lagoon, with its entrance eastward of Neptune Island, shoals too rapidly for good anchorage. The greater part of the lagoon bares at low water. **Aaron Creek** empties into the head of the lagoon.

Berg Bay, northward of Neptune Island, has depths of 5 to 11 fathoms to near its head, and affords the best anchorage in Blake Channel. Vessels can enter on either side of the island in the mouth, but should give the island a good berth, and avoid a reef extending 0.1 mile northward of the inner end of the island. Other tributaries of Blake Channel and Eastern Passage shoal rapidly inside their entrances, and are not good anchorages.

Between Neptune Island and The Narrows, the southern shore should be favored to avoid dangers which lie off the northern shore.

The Narrows, about 1.5 miles long and 250 yards wide at its narrowest part, connects Blake Channel with Eastern Passage. The only dangers are a reef off the northern point at the eastern entrance, and a rocky area with 3 to 4 feet over it at high water and marked by a buoy, on the south side of the channel and just westward of the narrowest part of the channel. The northern point at the western entrance is marked by a daybeacon.

Channel Island, about 100 feet high and wooded, lies in midchannel in Eastern Passage, about 1.2 miles westward of The Narrows. The island can be passed on either side but the channel northward is more direct. The small cove southeastward of Channel Island is used as an anchorage by very small craft.

Point Madan, on the eastern side of Eastern Passage, about 1.5 miles westward of The Narrows, is high and wooded. **Madan Bay,** eastward of Point Madan, is deep and clear of dangers. It offers excellent anchorage for small craft north of the projecting point near its head on the western side in 7 fathoms, soft bottom. Large vessels may find anchorage in 12 fathoms, soft bottom, farther offshore and near the head of the bay .

Mill Creek empties into the northern side of Eastern Passage about 5 miles above Point Madan where a small modern sawmill is now located. A road leads from the mill to **Virginia Lake,** about 1.2 miles inland.

Chart 8160.—Stikine Strait connects the northern part of Clarence Strait with the eastern end of Sumner Strait and the waters off the mouth of Stikine River. The strait is broad and deep, and is generally used by vessels

going to Wrangell, or following the Inner Passage from Clarence Strait to Wrangell Narrows. Both shores of Stikine Strait are free from dangers except at a few points, and all dangers are shown on the chart.

Currents.—In Stikine Strait the flood current sets northward through the strait until met by the current from Stikine River westward of Wrangell Harbor. Velocity of the current is about 2 knots. For daily predictions, see the Tidal Current Tables. The glacial waters of the Stikine River usually discolor all the water in the vicinity of Wrangell Harbor.

Quiet Harbor is on the southeast side of Stikine Strait southward of Round Point, Zarembo Island. Anchorage here is not advised as it is wide open to northerly weather.

A cove on the west side of Etolin Island, about 6.5 miles north-northeastward of Quiet Harbor, affords protection for small craft in southeasterly weather.

Round Point, the southeastern extremity of Zarembo Island, drops steeply from a high headland, rounding off in an almost perfect quadrant. The shoreline consists of gray and yellow cliffs rising to heights of about 40 feet. **Round Point Light (56°16.7′ N., 132°39.4′ W.),** 24 feet above the water, is shown from a small white house on the point.

Meter Bight, 4 miles northward of Round Point, is an open bight with sand flats at the head over a mile in extent which bares for about 500 yards offshore. Three streams empty through the flats. From the edge of the flats the water deepens rapidly.

South Craig Point, marked by a daybeacon, is about 7 miles northward from Round Point. It has no special characteristics.

Fritter Cove, to the southward of South Craig Point, is an open bight with rocks off the north point of the entrance. No information is available regarding depths inside.

Roosevelt Harbor, northwestward of South Craig Point, affords anchorage near the head for small craft in depths of 11 fathoms, mud bottom. In entering, leave the grass-covered rock at the entrance to the southward. The channel southward of the rock is reported foul.

Deep Bay is on the Zarembo Island side of the northern end of Stikine Strait, about 1 mile northward of South Craig Point Daybeacon. It is reported as too deep for anchorage until near the head.

Woronkofski Island, eastward of Zarembo Island, is about 5.5 miles in diameter. It rises in a series of peaks to **Mount Woronkofski** near its center, and is timbered to a height of 2,500 feet. The shoreline is generally rocky, with off-lying rocks close-to.

Reef Point, low and wooded, is the southwestern extremity of Woronkofski Island. Rocks and kelp extend offshore for about 300 yards. A rock with ¾ fathom on it lies about 0.6 mile north-northwestward from this point.

Drag Island, about 250 yards in diameter and about 150 feet high, is 0.2 mile off the point.

Point Ancon, on the western side of Woronkofski Island is marked by a light 20 feet above the water and shown from a small white house. A rock, awash, and kelp lie close to the point.

Wedge Point, about 1 mile northward of Point Ancon, is a low, thickly wooded point which shows prominently.

Elephants Nose is a knob on a ridge, near the northern end of Woronkofski Island.

Woronkofski Point, the northern point of the island, is low and rounding without any marked characteristics. The shore eastward of Woronkofski Point should be given a berth of at least 0.5 mile.

Fivemile Island is about 1.8 miles northward of Woronkofski Point. A light, 30 feet above the water, shown from a small white house, is on the north side of the island.

Chichagof Pass is between Etolin and Woronkofski Islands. It is clear except for Young Rock, with a depth of 2 fathoms, at the eastern end of Chichagof Pass in Zimovia Strait. **East Point,** at the eastern end of Woronkofski Island, is low and wooded. **Circle Bay** is an open bight westward of East Point.

Hat Island is at the entrance to Circle Bay, about 0.8 mile southwestward of East Point. It is wooded, and is marked by a light 19 feet above the water and shown from a small white house on the south side of the island. A rock, awash, is about 80 yards southward of Hat Island.

Chart 8164.—Highfield Anchorage is at the north end of Wrangell Island, about 1.5 miles from Wrangell Harbor. The anchorage is in 6 to 15 fathoms, fine sand and mud bottom, westward of the line of, and about midway between **Point Highfield** and **Simonof Island.** Anchorage also can be had in 4 to 12 fathoms, fine sand and mud bottom, eastward from that area to directly north of **Polk Point** and about halfway between Simonof Island and the shore of Wrangell Island. Light floating ice from Stikine River is encountered here in the spring, and countercurrents render a vessel very uneasy at times.

City of Topeka Rock, in Highfield Anchorage about 100 yards northwestward of the cannery ruins is awash at low water.

Wrangell Harbor is on the west side of the northern end of Wrangell Island, 1 mile below Point Highfield. It is a bight formed by **Point Shekesti,** which projects 0.4 mile in a northwesterly direction from the island. A breakwater 300 feet long extends from the north extremity of Point Shekesti, and affords protection for small craft in the southern part of the harbor. **Wrangell Breakwater Light (56°28.0′ N., 132°23.0′ W.),** 13 feet above the water, is shown from a small red house on a pier at the outer end of the breakwater.

Wrangell (pop. 1,315; P.O.) is a city on the north side of Wrangell Harbor. It serves as the ocean terminal for steamers plying the Stikine River to Telegraph Creek, B.C. Wrangell has three canneries. Two oil companies maintain stations with private service floats.

A Federal project provides for a mooring basin within the protected area in the southeastern part of the harbor; an inner basin on the tidal flat area east of **Shakes Island** with a connecting channel to it, all dredged to a depth

of 10 feet. The connecting channel is marked by daybeacons. In June 1956, the controlling depths were 9 to 20 feet in the mooring basin, and 10 feet in the inner basin and connecting channel.

Anchorages.—Wrangell Harbor affords shelter for large vessels only from offshore winds. The recommended anchorage for large vessels is in 18 to 20 fathoms, sticky bottom, with the breakwater light bearing 110° distant 300 yards. During heavy southeast winter gales Highfield Anchorage is sometimes used for better shelter. Good anchorage in strong southeast weather has been found 0.8 mile off the northeast side of Woronkofski Island in about 23 fathoms, mud bottom.

Dangers.—The approach to Wrangell Harbor is clear of dangers. A shoal with 3 fathoms on it extends about 80 yards northward of the breakwater.

Tides and currents.—The mean range of tide in Wrangell Harbor is 13.7 feet and the diurnal range 16.1 feet. Tidal currents in Wrangell Harbor are variable and vessels approaching the wharves should note the way small craft are swinging to anchor to determine the direction of the current, and should exercise caution in coming alongside.

Quarantine.—Quarantine examinations are made.

Customs.—Wrangell is a port of entry and marine documents may be issued.

Wharves.—There are two steamer wharves with depths of 24 to 38 feet alongside their faces, and several commercial and cannery docks. The latter are privately owned, but open to the public of payment of wharfage charges. In 1954 the northerly end of the harbor, where fire destroyed a considerable part of the waterfront property, was being rebuilt. A city dock and floats with Fish and Wildlife Service installations on the south side, is on the east side of Point Shekesti southeastward of the breakwater. About 1,300 feet of float for small craft, with a connecting ramp to Shakes Island, has been installed in the inner basin by the Alaska Department of Public Works.

Supplies.—There are several general stores where provisions, fishermen's supplies, and some ship chandlery can be obtained; also gasoline, diesel oil, and lubricating oil. Fresh water is available on the main wharves and at the Standard Oil Company float.

Repairs.—There are no facilities for repairs of large vessels. There is a machine shop where repairs to machinery can be made. Information about marine railways in Alaska is given in Chapter 3.

Communications.—There is regular daily air communication south to Ketchikan and north to Petersburg and Juneau both morning and afternoon. A light-draft river steamer makes regular weekly trips up the Stikine River from Wrangell during the summer months, and a small local vessel plies to points on the west coast of Prince of Wales Island. There is regular passenger and freight communication with Puget Sound and British Columbia ports, and with all towns in southeastern and southwestern Alaska. The United States Army Signal Corps maintains a cable and radio station with ship to shore services and continual radio telephone service to all Alaskan towns.

6. WEST COAST OF PRINCE OF WALES ISLAND

Chart 8152.—This chapter covers the outer coast between Dixon Entrance and Sumner Strait, and includes the inlets and bays on the west coast of Prince of Wales Island, and the off-lying islands with the connecting bodies of water. This area affords a protected inside passage for small vessels between Dixon Entrance and Sumner Strait. The main passages have been surveyed, but there are several inlets and bays which have not been surveyed.

The area is described in the following order: Forrester Island and west coast of Dall Island; Meares Passage; Cordova Bay; Hetta Inlet; Sukkwan Strait; Kaigani Strait; Tlevak Strait and Narrows; Ulloa Channel; Bucareli Bay; San Alberto Bay, and Klawak Inlet; Port Real Marina, Portillo Channel, and San Christoval Channel; Arriaga Passage, Gulf of Esquibel, and Tonowek Bay; Boca de Finas; Tonowek Narrows; Tuxekan Passage, Davidson Inlet, Sea Otter Sound, and El Capitan Passage.

Forrester Island (54°48′ N., 133°31′ W.), about 14.5 miles off the Dall Island shore and about 30 miles west-northwestward from Cape Muzon, is wooded. The northern half of the island is a ridge with distinctive summits; the southern summit is rounding, relatively flat with a ragged tree line; the next peak to the north is sharp; the third is rounding; the north peak shows flat, with two knobs. The southern part of the island is a wooded flat with a knob on the eastern side. At the southern end of the island is a detached knob, which from east and west directions appears as a separate island.

Forrester Island is a National Wildlife Refuge under the jurisdiction of the U.S. Fish and Wildlife Service.

There are no secure anchorages off Forrester Island. During the summer small craft anchor in four different places: namely, Wood Cove, Eagle Harbor, the north end, and the bight on the western side near the north end. Anchorage is close to the beach at the edge of the kelp in about 10 fathoms, rocky bottom. There is a small fresh-water stream in Eagle Harbor.

Wood Cove and **Eagle Harbor** are on the east side of the island, 1.4 miles and 0.8 mile, respectively, from the north end.

Petrel Island is about 1 mile southward from Forrester Island. It has two wooded summits. From a distance these appear as two islands.

South Rock, close to the south end of Petrel Island, is not very prominent. Between South Rock and Petrel Island is a rock, 73 feet high, and several smaller rocks.

Northward of Forrester Island for 3 miles there are, in succession: **Sea Lion Rock,** 117 feet high, with a flat and grassy top; **Cape Horn Rocks,** 148 feet high, with steep sides and grassy tops; **Lowrie Island,** wooded, and **North Rocks,** 15 to 25 feet high, a group with outlying rocks and breakers.

Breakers are numerous around the Forrester Island group, but for the most part are close to shore or are readily discernible. **Butler Rock,** 20 feet high, is 500 yards westward from the point on the north side of the bight in the northwest end of Forrester Island. Breakers are northward and southward of the rock. A breaker between Sea Lion Rock and Lowrie Island is reported to break at low water springs with a moderate swell. During unusually fair seasons, this locality has been marked by kelp.

The pass between Forrester Island and Petrel Island is used by fishermen. At times the currents are severe, and during heavy weather it is dangerous. The channel around the north end of Forrester Island and south of Sea Lion and Cape Horn Rocks is reported clear; that between Sea Lion Rock and Cape Horn Rocks is seldom used. There is a channel between Lowrie Island and North Rocks, but the locality of North Rocks is reported foul. The passes are used only by small fishing craft and should only be attempted by those with local knowledge.

Wolf Rock, 13.5 miles 005° from the highest summit of Forrester Island, is small in extent and bare of vegetation; it is surrounded by foul ground to a distance of over 0.5 mile.

Currents.—A few observations made during June 1917, at times when the sea and air were calm, between Dall Island and Forrester Island, show a northeasterly to northwesterly set varying from 0.3 to 1.3 knots. Westward of Lowrie Island at the 100-fathom curve, a northeasterly to northerly set of 0.1 knot to 0.8 knot was observed. Near the 1,000-fathom curve, a slight southerly set was experienced during calm weather.

The currents have considerable strength in the vicinity of the rocks and islets off Forrester Island, and are irregular in direction, but generally have a northerly set during flood. Tide rips are usually found around Forrester Island and in the passages between the rocks.

Dall Island, the largest island off the west coast of Prince of Wales Island, is about 40 miles long from Cape Muzon, its southeastern extremity, to Eagle Point, its northwestern extremity, in Meares Passage. It is about 8 miles wide between Cape Augustine and High Point, in Tlevak Strait. It is mountainous; Thunder Mountain in the vicinity of Cape Lookout is 3,010 feet high. Both the east and west coasts of the island are indented by numerous bays, coves, and inlets, some of which are excellent harbors of refuge.

The west coast of Dall Island from Cape Muzon to Meares Passage, a distance of about 40 miles, is rugged with prominent partially wooded peaks ranging in elevation to 3,000 feet.

Chart 8146.—**Chickwan Bight,** about 2.5 miles west-

ward of Cape Muzon, is open and exposed and has depths of 30 fathoms at the entrance, decreasing to 12 fathoms near the head.

Wolk Harbor, about 4 miles westward of Cape Muzon, is deep throughout and is open and exposed. Midchannel depths range from 30 to 40 fathoms. There are tide rips off **Wolk Point** between Chickwan Bight and Wolk Harbor.

Liscome Bay, about 5 miles westward of Cape Muzon, affords an anchorage for small vessels but is exposed to southeast weather and swell. Favoring the western shore, depths of 40 fathoms at the entrance to 23 fathoms in the vicinity of the rocks may be carried. Depths of 8 to 16 fathoms are found at the head of the bay.

Point Cornwallis is a prominent headland, about 7 miles westward of Cape Muzon. At the extremity is a projecting rocky point, 195 feet high, on the northerly side of which, close-to, is a similar point, 131 feet high, near which are two small rocks. Immediately back of the point is a round-topped hill, 440 feet high. **Stripe Mountain,** about 1.3 miles northeastward of the point is marked by a prominent slide on the west side.

Security Cove is 3 miles northward of Point Cornwallis. Depths at the entrance are deep but irregular; in the narrow part, depths of 11 fathoms are obtained. Depths of 26 to 40 fathoms are found inside. In the bight on the north side, close inside the narrowest part of the entrance, small craft have found temporary anchorage in depths from 6 to 22 fathoms. A small lake, about 0.5 mile inshore, at an elevation of 950 feet, empties into the head of Security Cove.

Essowah Harbor is about 1.5 miles north-northwestward from Security Cove. The entrance channel is about 0.3 mile long and 30 yards wide; there are two rocks near the entrance. **Essowah Lakes** empty into the head of Essowah Harbor. A small lake 0.5 mile south of Essowah Lakes, empties near the entrance to Essowah Harbor.

Parrot Rock is about 0.8 mile westward from **Essowah Point,** the point south of the entrance to Essowah Harbor, and lies about 0.2 mile offshore.

Port Bazan (54°49′ N., 132°59′ W.) is between two prominent mountain peaks, about 16 miles from Cape Muzon and 9 miles northwestward of Point Cornwallis. The northwestern mountain top is a small bare tip and the southeastern mountain is roughly the shape of a rounded cone, and is heavily wooded to the top. Often when the tops of the mountains are enveloped in fog or low clouds, the latter mountain stands out clear. There are a number of islands within the port.

Dolgoi Island, at the entrance to Port Bazan is mound-shaped and wooded (with the seaward side rocky and bare of vegetation) to heights of 50 to 100 feet. There are through channels to the northwestward and southeastward. Westward from Dolgoi Island, on the southern side of the entrance to the north channel, is a group of four islets close together, the outermost of which on its western side is a precipitous sharp pointed rock, light brown to white color, 125 feet high; the eastern portion is lightly wooded. The next larger islet is lightly wooded; the other two are small and bare. A shoal with a depth of 4 fathoms, and probably less, is about 750 yards 325° from the western extremity of the largest islet.

Port Bazan affords good anchorage northward and northeastward of the islands which stretch across the eastern part of the bay. The anchorage is well protected from the swell and is generally free from williwaws. It can be entered either southeastward or northwestward of Dolgoi Island, but the northwest entrance is more often used. At low water the channels are fairly well defined. Rocks which cover are a considerable distance from the shores of the narrow channels, presenting elements of danger to those without local knowledge. The known dangers are shown on the chart.

Anchorage may be had northeastward of the islands in the center of the bay in 15 to 18 fathoms, mud bottom, or in the bight northward of the north island in 11 to 13 fathoms. A rock, bare at low water, lies close to the northeast end of the north island. A small 6-fathom shoal lies 0.2 mile northeastward from the northern island. The small bight at the head of the bay is foul.

Tides and currents.—The mean tide range is about 9 feet while the diurnal range is about 11 feet. Currents are reported to seldom exceed 1 knot.

A bay, with its entrance between **Ritter Point** and **Gooseneck Point** and divided into two parts by a chain of islands, lies about 2.5 miles northwestward from Port Bazan. The western part of the bay is deep but open and exposed; the eastern part is foul and has numerous rocks and kelp patches.

Chart 8148.—Gooseneck Harbor, about 4 miles northwestward of the northwest entrance point to Port Bazan is identified by a black rock, 65 feet high, south of and close to the entrance. A rock, which bares, is almost in midchannel, about 0.8 mile inside the entrance. In entering, follow the north shore at a distance of about 250 yards. Anchorage for small boats may be had 100 yards off the north shore, 1.5 miles within the entrance, after rounding the point on the northwest side. The head of the bay is foul.

Gold Harbor, 6 miles northwestward of the northwest entrance point of Port Bazan, is reported clear in midchannel. On the north side of the bay is a peak, on the southerly side of which is a very prominent landslide, 110 yards wide and 350 yards long, with its top at an elevation of 1,560 feet. About 2 miles from the entrance and about 0.6 mile from the northern shore are **Twin Peaks** about 550 yards apart. The peaks are bare above an elevation of 1,700 feet.

About 0.9 mile from the entrance, to the southward of midchannel, is a small island. A midchannel course, passing northward of the island leads to the head of the bay, where depths of 23 to 30 fathoms are found. The small cove westward of the northwest point of the entrance to Gold Harbor is foul.

Waterfall Bay is about 9 miles northwestward of the northwest entrance point to Port Bazan. The entrance is distinguished by a bold, bare point on the southeast side and by **Gourd Island,** a wooded islet in the middle. Near the head of the bay are extensive deposits of marble

on the slopes of Twin Peaks, two prominent bare summits which lie about 0.6 mile eastward of the head. Inside the bay, about 1 mile from the entrance, are two small islands, one close to the northern shore, the other about midchannel. Dangers are shown on the chart. There are two prominent waterfalls in the bay; one at the head and the other on the northern shore close to the north island.

The bay may be entered northwestward or southeastward of the entrance island. A narrow area with 8 fathoms on it extends from the northern shore of the bay to within 270 yards of the north side of the entrance island. A channel about 120 yards wide, with depths of 21 to 38 fathoms, lies between this area and the rocks and kelp which extend off the northern side of the island for about 100 yards.

The channel between the two islands within the bay has depths of 11 to 34 fathoms. The channel to the southward of the southern island has depths of 25 to 48 fathoms, with an 8-fathom spot, marked by kelp, 0.2 mile to the southwestward of the island. If this channel is used, round the island at a distance of about 180 yards, leaving the 3¼-fathom spot to the eastward.

Anchorage may be had near the head of the bay in 26 fathoms, sticky bottom. Westerly winds draw into the bay with considerable force and with southeast winds, williwaws are severe. Small craft anchor in 10 fathoms on the northwest side of the bay, westward of the small islands, 1.5 miles inside of the entrance. There is anchorage for small craft, 50 feet in length or under, in 5 fathoms, mud bottom, in the small bight at the extreme head of the bay.

Cape Augustine, at the northwest side of the entrance to Waterfall Bay, has several bare black rocks close-to.

Augustine Bay is a small bay northward of Cape Augustine. Kelp and rocks extend offshore; depths of 8 to 16 fathoms are found near the center of the bay. It is open and exposed and is not suitable for anchorage.

Welcome Cove is about 1.5 miles northward from Cape Augustine. Off the entrance the ground is foul, but there is a narrow channel into the cove, where anchorage may be had for small boats in 4 to 6 fathoms, mud bottom. The entrance should not be attempted without local knowledge.

Camp Cove is about 2.5 miles northward from Cape Augustine. Off the entrance is a rock 15 to 20 feet high with foul ground extending in a northerly direction to the shore. The southern shore of the cove is foul.

Devil Lake, about 0.5 mile to the northwestward of Camp Cove, empties to the northward of **Devil Island.** The channel at the entrance is very narrow. The lake extends at least 3 miles in a northeasterly direction.

Fisherman Cove is about 4.5 miles northward from Cape Augustine. At the entrance is a small island on which are a few scattered trees. In entering, pass the southern point of this island at a distance of about 100 yards and steer for the left or west edge of the sand beach at the head of the cove. The anchorage is about 170 yards wide, with depths of 3 to 6 fathoms, mud bottom, and is large enough for four or five small fishing vessels.

Sakie Bay is about 7.5 miles north-northwestward from Cape Augustine. Rocks and reefs extend 0.6 mile offshore in a southwesterly direction from **Sakie Point,** the southern point of the entrance. The outermost rock is 20 feet high. **Table Rock** is the most prominent of the rocks which extend about 320 yards off the northern shore at the entrance. The channel, about 300 yards wide, lies to the southward of Table Rock. Tide rips, severe for small craft, are experienced at the entrance. The bay has not been thoroughly surveyed.

Middle Island is near the center of the bay. Near the head of the bay and about 450 yards off the northern shore, is a group of small islands and rocks. Anchorage can be found in the bay in 6 to 8 fathoms, sticky mud bottom.

Cape Lookout is a prominent headland about 1 mile northward of Sakie Bay. From the cape, extending in a southeasterly direction, are four prominent peaks. **Cone Mountain,** 0.6 mile from the extremity of the cape, is a symmetrical, timbered cone. **Bear Mountain,** 1.4 miles from the cape, is round-topped, and timbered to an elevation of 1,800 feet. **Thunder Mountain,** the highest peak on Dall Island, 2.8 miles from the cape, has a bare, rugged summit.

There are several breakers off Cape Lookout. One, 3.4 miles 283° from the cape, has no kelp on it and does not break in a calm sea. A 2½-fathom shoal, which breaks, is 2.8 miles 295° from the cape, and 0.4 mile northward of it, is another shoal, covered with a heavy mass of kelp, which breaks only in a heavy sea.

Sea Otter Harbor on the north side of Cape Lookout divides into two branches about 1 mile from the entrance.

Entrance Island, a prominent rock, is 0.6 mile northwestward of Cape Lookout and a little to the southward of the middle of the entrance to Sea Otter Harbor. From Entrance Island, rocks extend 0.2 mile in a northerly direction, 0.5 mile in a westerly direction, and kelp patches extend to a breaker 0.8 mile in a southerly direction, about 0.4 mile off Cape Lookout.

Juel Point, the headland on the north side of Sea Otter Harbor, is rugged and rocky. From the point the land slopes eastward for 1.3 miles to a summit, 1,100 feet high.

Within the entrance, 1.5 miles from Entrance Island, a group of rocks extend 0.2 mile off the northern shore of the bay. The largest and southernmost rock of this group is known as **Gate Island.** **Clear Point** is the western extremity of the headland which divides the bay into two arms. To the southward of this point, is **Nellag Island,** with off-lying rocks close-to, extending in a westerly direction.

In entering Sea Otter Harbor, small boats with local knowledge frequently use a channel to the eastward of Entrance Island, passing close to Cape Lookout.

Hook Arm, the northern arm of Sea Otter Harbor, is well protected from wind and sea. Anchorage may be had anywhere in the arm in 21 to 26 fathoms in the

center, 17 to 19 fathoms at either end, mud bottom. Small vessels can anchor in 8 to 15 fathoms at the head of the arm or in the bight northward of Channel Island. A small sand and gravel beach is at the head of this bight.

Camp Island, small and rocky, lies close to the western shore of Hook Arm, about 0.5 mile northward of Clear Point.

Channel Island, separated by a very narrow passage from the western shore of Hook Arm about 0.8 mile northward of Clear Point, is wooded. **Low Rock** and a rock awash close eastward, are 200 yards off the southern shore of Channel Island.

Two small rocky islets are near the head of Hook Arm; the outermost is 240 yards from the north shore.

The west end of Nellag Island should be given a berth of at least 100 yards. The rocks off Camp Island and Low Rock, and the rock awash, are the principal dangers in the channel.

Manhattan Arm, the southeast branch of Sea Otter Harbor, is exposed to the force of the wind and sea and is too deep for secure anchorage. A rocky islet, with off-lying sunken rocks, is in the middle of the arm.

Chart 8151.—Foul Bay is about 2.5 miles northward of Cape Lookout. In the center of the bay near the entrance is a cluster of sunken rocks. The shores of the bay are foul where the bay narrows; reefs extend from either shore almost to midchannel, leaving a narrow passage 50 to 100 feet wide through which very small boats pass to a secure anchorage in 5 to 6 fathoms near the head of the bay. Only those with local knowledge should enter the bay.

Meares Passage is at the northwest end of Dall Island, between it and Suemez Island, and affords passage from the sea to Tlevak Narrows and the eastern part of Ulloa Channel. The approach to Meares Passage from westward is foul in places for 2 miles from the Suemez Island shore.

Suemez Island, approximately 8 miles in diameter, is west of and separated from the northern end of Dall Island by Meares Passage. The island is mountainous; the peaks are generally rounded, and wooded, except near the summits. The shoreline is rocky, fringed by small rocky islets and kelp, and indented by numerous bays and inlets.

Arena Cove is a small open bight in the southern shore of Suemez Island westward of **Lontana Point,** the southeastern extremity of the island. It has depths of 17 fathoms near the entrance, shoaling to 6½ fathoms near the head.

Diver Islands, off the eastern shore of Meares Passage, are prominent when approaching from seaward. The westerly island is wooded; the easterly island has a lone tree on its summit. The passage eastward of the islands is narrow and its shores are marked by heavy kelp. Most small craft coming from the south use this passage when the weather permits.

Diver Islands Light (55°10.7′ N., 133°15.8′ W.), 125 feet above the water, and shown from a small white house on the west side of the island, marks the southwestern entrance to Meares Passage.

Diver Rocks, two in number and bare at half tide, are about 0.2 mile westward of the island and a 2½-fathom shoal, marked with kelp, is 200 yards westward of them.

Diver Bay, on the southeastern side of Meares Passage at its entrance, extends eastward from Diver Islands. The bay is clear except for a kelp-marked rock with ½ fathom over it, which lies 650 yards from the north shore nearly in midchannel. Small craft can find excellent anchorage in the **Hole In The Wall,** an indentation in the northern shore; the entrance is narrow, but has a least depth of 4¼ fathoms. Pass either side of the ½-fathom rock in entering.

Bobs Bay, the entrance to which is northeastward of Diver Islands, is an irregularly shaped bay, obstructed by a chain of reefs and islands. The bay is divided into three arms, the middle one of which is foul and not navigable except by small boats. The easternmost arm affords good anchorage for moderate sized craft in 6 to 10 fathoms, soft bottom. Enter Bobs Bay 0.2 mile or more southward of the largest outer island, and follow the east side of the island at a distance of about 250 yards. Pass in midchannel southward of the high island off the entrance to the east arm.

Millar Rocks, a number of bare rocks, are about 1 mile northward of Diver Islands. The passage northward of the rocks is foul to the Suemez Island shore, although there are deep passages between. In heavy weather the entire area appears to be covered with breakers.

In the northern part of Meares Passage, about on a line from **Eagle Point** to the summit of Ridge Island, at a distance from Eagle Point of about 0.6 mile, and 1.5 miles, there are several rocky kelp-marked patches with deep water between, all of which should be avoided.

Currents.—The tidal currents in Meares Passage set northeastward on the flood and southwestward on the ebb. The estimated velocity of the current is about 3 knots. For daily predictions for places in the passage, see the Tidal Current Tables.

Chart 8152.—Cordova Bay has its entrance on the northwest side of Dixon Entrance between Cape Muzon and Point Marsh and extends about 18 miles in a northerly direction from between Dewey Rocks and the southeast end of Long Island. The bay has a clear channel 3 miles wide between Barrier Islands and Long Island, and an average width of 3 miles from Ship Islands to Lime Point. From the head of Cordova Bay at Lime Point, Hetta Inlet extends in a general northerly direction for about 15 miles to Gould Island.

The best entrance to the bay is between Barrier Islands and Long Island, but Eureka Channel, eastward of Barrier Islands, is sometimes used by vessels with local knowledge. From Cordova Bay and Hetta Inlet, Tlevak Strait and Sukkwan Strait extend northwestward and afford through channels to Bucareli Bay. Small craft ply from Ketchikan to Cordova Bay, Hetta Inlet, and other points on the west coast of Prince of Wales Island.

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Currents.—In Cordova Bay and adjacent waters the flood current sets northward and the ebb current southward. The estimated velocity of the current is from 2 to 3 knots, with the stronger velocity occurring in the narrows. For daily predictions, see the Tidal Current Tables.

Chart 8146.—The western side of the entrance to Cordova Bay from Cape Muzon to Natoma Point is comparatively clear.

Off the eastern end of Cape Muzon are a group of small islands and rocks, inside of which, on the main shore, is a sandy beach where landings can be made in good weather. This area was occupied by the Hyda Indian tribe at the time they migrated north from British Columbia and Puget Sound territory. All that remains now to mark the site of their village of **Kaigani** are a few graves. Rather severe tide rips are experienced off the cape. Along the south shore of the cape, close in, are several large rocks. The shoreline in this section is rocky, precipitous, and marked by light-colored cliffs. A breaker is about 0.2 mile off the south shore of the cape. Vessels in passing should give the cape a berth of at least 1 mile.

Local magnetic disturbance.—Differences of as much as 4° from normal variation have been observed at Cape Muzon.

The north side of Cape Muzon trends west-northwestward for about 3 miles, forming the southern side of **McLeod Bay.** Temporary anchorage in 11 fathoms, exposed to all easterly winds, may be had in this bay, about 0.5 mile westward of a green landslide. The chart and the lead are the best guides, as landslides frequently occur, and there are several besides the one mentioned. At the head of the bay is a small stream of fresh water and a sand and gravel beach for 200 yards. **Little Daykoo,** a small-boat harbor, is about 0.5 mile to the northward.

Daykoo and **Datzkoo Islands** extend 2 miles in a northerly direction from McLeod Bay at a greatest distance offshore of about 1 mile.

Long Island forms the western side of Cordova Bay for a distance of about 12 miles. The eastern shore of the island is rugged and broken, with a number of outlying islets and rocks within a distance of 0.5 mile. There are also a number of indentations and some anchorages.

A shoal area which ends in a sunken rock with 1¼ fathoms over it and marked by kelp extends for 0.5 mile off the southern point of Long Island. This point is marked by a very prominent landslide about 0.3 mile inshore. The points at the southern and southeastern parts of the island should be given a berth of not less than 0.8 mile.

South Rocks, about 0.3 mile off the southeastern point of Long Island, consist of two large rocks, 28 and 29 feet high, and several smaller rocks.

Coning Inlet is on the eastern side of Long Island about 4.5 miles from the southern end. It is open to eastward and does not afford good anchorage. A lagoon is at the head of the inlet to which it is connected by salt water rapids.

Nina Cove, on the south side of Coning Inlet at the entrance, affords secure anchorage for small craft in 3 to 4 fathoms, sticky bottom. The anchorage is about 200 yards in extent and lies southward of the small islet in the center of the cove at its head.

Coning Point, the north point at the entrance to Coning Inlet, is low and wooded. A conspicuous black rock 40 feet high lies about 0.2 mile off the point.

Natoma Bay, on the eastern side of Long Island about 6 miles from its southern end, is about 1 mile in diameter and open to eastward and southeastward. Partially protected anchorage can be had in the northern part of the bay in 12 to 20 fathoms, mud bottom. The entrance is on either side of the two wooded islets in the middle of the entrance. The shores of the bay are foul and should be given a good berth.

Natoma Point, low and wooded, is the northern point at the entrance to Natoma Bay. A large, wooded, high-water islet is close off the point to southward.

Chart 8145.—The eastern side of the entrance to Cordova Bay, from Point Marsh to Shipwreck Point, is very broken and abounds with islands, reefs, shoals, and pinnacles in random pattern. The channels between the islands, for the most part, are deep with steep sides but are often obstructed by shoals. Currents and eddies about the islands, large tides, and exposure to ocean swells, make the running of straight courses difficult.

Small fishing vessels bound between Point Marsh and Eureka Channel frequently pass through **Minnie Cutoff,** then run between the reefs close inshore along the southwest coast of Prince of Wales Island, and thence through Thompson Passage to Eureka Channel. Local knowledge is necessary. There are few protected anchorages for large vessels in the area.

Round Islands Light (54°46.7′ N., 132°30.3′ W.), 56 feet above the water, and shown from a small white house on the west side of the westernmost of the Round Islands, marks the eastern approach to Cordova Bay.

Round Islands, about 7 miles northwestward of Point Marsh, consist of four small wooded islands about 150 feet high. A dangerous rocky reef which uncovers 6 feet is about 500 yards westward of Round Islands Light. Between the reef and the island are other rocks awash and kelp patches; this area should be avoided.

Dewey Rocks, about 1.8 miles south-southeastward of Round Islands Light, are small in extent, and consist of one large rock and several smaller ones which uncover at various stages of the tide. A red sector in Round Islands Light from 327° to 346° covers Dewey Rocks.

Egg Rock, 20 feet high and bare, is about 0.5 mile northward of Round Islands, with extensive areas of kelp between. One mile northward of Egg Rock is a wooded islet with a rock which uncovers 4 feet about midway between

it and Egg Rock. Some fishing vessels use **Egg Passage,** about a half mile east of Egg Rock and Round Islands, but this passage is not recommended for strangers.

Boat Rocks, two in number and bare, are about 2.5 miles northward of Round Islands, and are the northwesternmost dangers of this group. Eastward of a line from Round Islands to Boat Rocks are numerous dangers.

Barrier Islands are an extensive group of wooded islands lying between 4 and 8 miles northwestward of Point Marsh, and eastward of Round Islands. **Black Rock,** the southernmost large offshore rock of the Barrier Island group, is a conspicuous black rock near the southeast edge of a foul area containing numerous rocks awash. A 1½-fathom shoal is approximately 0.7 mile south-southeast of Black Rock. Approach courses to seldom-used channels through the Barrier Islands pass about half a mile both east and west of Black Rock. These two passages, continuing east and west of **Middle Island,** are useful only to small craft. It is possible to carry 2 fathoms of water through the west passage and 7 fathoms through the east.

Mexico Point, at the southeastern end of Eureka Channel about 3 miles northwestward of Point Marsh, is the western extremity of an island, bluff and wooded, with several high rocky islets extending about 0.3 mile off it. The area along the south and southeast sides of the island is very foul, and there are numerous shoals, rocks, and islets between Mexico Point and Point Marsh. **Thompson Pass,** used extensively by fishing craft, extends between the islands from 1.2 to 1.5 miles north and northeast of Mexico Point. Although 8 fathoms can be carried through it, this passage is not suitable for large vessels. Small vessels using it frequently continue through the narrow passage off the mouth of Minnie Bay behind Point Marsh where 2 fathoms can be carried.

Hessa Inlet, northeastward of Mexico Point, is about 3.5 miles long and has depths up to 40 fathoms. The best approach to the inlet is through the passage north of **Hessa Island,** but it can be approached from the south via **Buschmann Pass**; only small craft with local knowledge should attempt this pass which is narrow and full of rocks. In **Hessa Narrows** the tidal currents attain a velocity of 6 to 7 knots.

Eureka Channel, between Barrier Islands and Prince of Wales Island affords a short cut to Klakas Inlet and is suitable for moderate-sized craft with local knowledge; large vessels should use the passage westward of Dewey Rocks and Barrier Islands. The depths in Eureka Channel are good, but it is narrow and has several dangers which are generally marked by kelp in summer.

Far Point, on the west side of Eureka Channel and at the southeastern extremity of Barrier Islands, is about 1.5 miles north-northwestward of Mexico Point. Eureka Pass Daybeacon is on the south end of the small island about 0.4 mile northeastward of Far Point.

Center Island is a small round island with a few trees, about 1.2 miles north-northeastward of Far Point, and 0.4 mile southward of **Leading Point.** It is fairly steep-to on all sides, and can be approached closely. A rock, awash at high water and marked by Center Island Reef Daybeacon, is 350 yards westward of Center Island.

For about 0.6 mile northward of Leading Point, the narrowest part of Eureka Channel is **The Narrows,** which has a least width of 125 yards. Good depths are found through The Narrows except for narrow ledges close to the west shore. About 480 yards northward of the northern end of The Narrows is a sunken rock which is awash at extreme low tides.

Guide Rocks, gray in color and marked by a daybeacon, lie about 0.5 mile north-northeastward of the northern end of The Narrows and are conspicuous, except at high water, when coming through The Narrows.

Currents.—Tidal currents through the narrows have an estimated velocity of from 1 to 2 knots. The flood sets northward and the ebb southward.

Directions, Eureka Channel.—From a point 670 yards west of the rocky islets off Mexico Point, a course of **002°** will keep in the deepest channels and clear all dangers in the southern part of Eureka Channel. Center Island Reef Daybeacon is on the leading bearing on this course. It is almost on range with the east tangent of the second group of islands west of The Narrows. The **002°** course passes 345 yards east of Eureka Pass Daybeacon and if made good keeps well clear of a sunken rock with a least depth of 3 feet which is about 0.7 mile north-northeast of Eureka Pass Daybeacon. When Center Island Reef Daybeacon is distant 440 yards and the west bank of The Narrows is slightly open change course to **022°** and pass about midchannel between Center Island Reef Daybeacon and Center Island, slightly favoring the daybeacon but keeping clear of the kelp bed that lies northeast of the daybeacon. When Guide Rocks Daybeacon shows in the middle of The Narrows, change course to **032°** which is a leading bearing on that daybeacon. Continue on this course until the north tangent of the nearest island bears **275°**, then change course to **350°** for Klakas Inlet and Hunter Bay. Avoid the sunken rock which is 205 yards northeast of the north point of the island that forms the west side of The Narrows. This rock is awash at extreme low tides. Small fishing vessels also frequently use the channel that leads to the north-northwestward from a point about 0.3 mile south of Center Island Reef Daybeacon. An extensive shoal area in this channel is 0.7 mile northwest of the daybeacon where the best water is near the west shore.

Wallace Rock, with ½ fathom over it and marked on its northwestern side by a buoy, is about 2.3 miles northeastward of Boat Rocks. Vessels going to Hunter Bay usually pass well northward of it.

Tah Bay, northeast of Guide Rocks, has depths up to 40 fathoms. Several rocks and reefs near the center of the bay bare. The best entrance is to the northward of **Tah Island**; the entrance southward of that island is partly obstructed by a rock covered by 7 feet. There are no good anchorages available, although small craft can anchor near the beach at the southern part of the bay.

Turn Island is about 3 miles northward of the northern end of Eureka Channel, and is the easternmost of a number of small islands. It is bare except for a small stunted growth of trees, which give it the appearance of a building. It is bold-to on the western and southern sides, but

foul ground extends about 0.2 mile north-northeastward and 180 yards eastward.

Turn Point is about 1 mile east-northeastward of Turn Island and consists of a number of small, low, grassy rocks. It is at the extremity of a low peninsula which is not wooded for about 300 yards back from the point.

Hunter Bay makes in for a distance of about 2.5 miles eastward of Turn Point. The entrance to the bay is obstructed on its northern side by a number of islets, but the channel close around Turn Point is comparatively clear. About a mile above the entrance, the bay contracts to a width of 275 yards, with a large rock lying in the middle; the best channel is on the northern side of the rock. Eastward, about 0.4 mile distant, is an arm leading north-northeastward about 1 mile to **Biscuit Lagoon.** Passage into this lagoon is through a narrow pass which is partially obstructed by several rocks. Small craft of 3-foot draft can clear these rocks at high water. Tidal currents are strong and passage should be attempted only on the high-water slack.

The Saltchuck is the Indian name for the brackish lagoon to the northwest of the upper end of Biscuit Lagoon. The two are connected but the passage is too shallow for navigation other than by small skiffs.

There is good anchorage in Hunter Bay about 2 miles eastward from the entrance in 10 to 15 fathoms. The anchorage, however, is subject to strong williwaws with winds from the east meeting those of equal force from the west. Velocities up to 90 miles have been experienced here. Nearby, off the south shore of the bay, is an islet surrounded by a flat of considerable extent. About 0.2 mile beyond the anchorage the bay contracts and is foul.

Klinkwan Cove, east of **Gusdagane Point,** should be avoided as it contains many rocks. The abandoned Indian village **Klinkwan** is just east of **Grave Point.** In 1954, only a few logs and plank-walks marked the old village site.

Chart 8147.—Klakas Inlet joins Cordova Bay westward of the entrance to Hunter Bay. The inlet is about a mile in width, 12 miles in length, and 20 to 100 fathoms deep in midchannel. **Max Cove,** about 3 miles above the entrance on the east side, offers good anchorage for small craft near the southeastern end in 8 fathoms, mud bottom. The main entrance to Klakas Inlet is east of **Klakas Island,** with the deepest water favoring the west side of the entrance. Local fishermen frequently use **Ruth Cutoff,** the narrow pass north of Klakas Island which has a controlling depth of 2 fathoms, and extends from Ruth Bay to Klakas Inlet.

Good anchorage in a depth of about 20 fathoms can be found eastward of a small wooded island about 1.5 miles eastward of the north end of Klakas Island.

Bird Rocks, about 1.3 miles southwestward of Klakas Island, have a gray appearance with a rounded white pinnacle which forms the highest point.

Shipwreck Point is about 1.8 miles west-northwestward of Bird Rock. The point is low and timbered and rises to a knob 605 feet high. **Barbara Rock,** a low rocky islet, is about 300 yards off the point. An island, about 160 feet high, is close-to and westward from this point.

Ship Islands, 50 to 120 feet in height, with outlying rocks and ledges, are about 0.5 mile offshore, westward of Shipwreck Point. Small craft from Turn Point, pass northward of Bird Rocks and between Shipwreck Point and the island close-to. There is a sunken rock in the narrow channel. The pass to the westward of the inner island is preferable, avoiding the rock in the middle of the entrance.

Kassa Inlet, just northward of the northernmost of the Ship Island group, has an entrance about half a mile wide. Good anchorage for small craft is available at **Clam Cove** and several places in the upper reaches.

Point Webster, about 6 miles northwest of Shipwreck Point, is a small projection where the eastern shore of Cordova Bay changes direction. There are a number of outlying rocks and reefs in the vicinity of the point, and this shore should be given a berth of 0.5 mile.

Elbow Bay, on the western side of Cordova Bay, indents the northeastern side of Long Island and is partially protected by two wooded islands, connected at low water in the entrance. Good anchorage for small vessels can be had in the southeastern arm in 13 fathoms, mud bottom. The anchorage is about 250 yards wide. A large lagoon extends southward from the western end of the bay, to which it is connected by a narrow rocky channel. This channel is impassable except at high water on account of rapids.

To enter Elbow Bay, pass in midchannel southeastward of the wooded islets in the entrance, avoiding the reefs making off to southward of the islets. The sunken rock in the middle of the bay can be passed on either side, the western side having the best water.

Dova Bay, on the northern side of Long Island, appears to be well-protected at its head, but due to the configuration of the surrounding hills, southeasterly and northwesterly winds draw across it with considerable force. The shores are lined with small islets and rocks.

Tlevak Strait has its entrance on the western shore of Cordova Bay between Long Island and Jackson Island. It is described later in this chapter.

Shoe Rock, about 15 feet high, is about 160 yards northward of the most easterly of a group of small islands at the junction of Tlevak Strait and Cordova Bay.

Jackson Island, off the southern end of Sukkwan Island, has prominent cliffs on its southern side. About 300 yards southwestward of these cliffs are two dangerous rocks which bare only on minus tides. The channel between Jackson and Lacey Islands is partially obstructed by **Triplet Rocks,** a group of three large rocks the most prominent of which uncovers 10 feet. **Jackson Passage,** the channel westward of Jackson Island, is clear in midchannel.

Lacey Island, about 0.8 mile eastward of the southeast end of Jackson Island, comprises three small wooded knolls close together and joined by bare spits. Foul ground extends up to 0.2 mile from the island.

Mellen Rock, a bare rock about 0.8 mile off the western shore of the bay, and about 3 miles to the northeastward

of Jackson Island, is marked by **Mellen Rock Light (55°01.6′ N., 132°39.9′ W.)**, 32 feet above the water and shown from a small white house on a brown skeleton structure.

Hassiah Inlet, on the eastern shore of Cordova Bay, about 2.5 miles northward of Point Webster, is about 2 miles long to the head of its northeast and east arms, the latter being a landlocked anchorage known as **Mabel Bay. Mabel Island,** on the south side of the entrance, is wooded, with a low place in the center giving the appearance of two islands. **Helen Island,** in the south arm is low and wooded, and has rocky beaches on the north and west shores and sandy beaches on the east and south shores.

To enter Mabel Bay pass northward and eastward of Mabel Island, giving it a berth of 0.2 mile, and steer for the eastern end of Helen Island. Follow a careful midchannel course, passing northeastward of Helen Island, and anchor about 0.2 mile from the islet at the head in 10 to 12 fathoms.

Nutkwa Inlet and **Keete Inlet** are at the head of Cordova Bay eastward of Lime Point. Nutkwa Inlet, about 4 miles north of Webster Point, is 1.5 miles wide at the entrance and extends about 5 miles north-northeastward. Depths range from 90 fathoms at the entrance to 10 fathoms at the head, with several shoals of 4 to 6 fathoms in between. **Nutkwa Point** is the promontory between the two bays.

Nutkwa Lagoon is a narrow body of water about 3 miles long with midchannel depths of from 40 fathoms at the southwest end to 20 fathoms at the northeastern part. **Nutkwa Falls,** at the head of Nutkwa Inlet, obstructs passage into the lagoon; on the higher water slacks, drafts of 3 or 4 feet can be carried into the lagoon, but this passage should not be attempted without local knowledge.

Keete Inlet has depths up to 30 fathoms in midchannel. A good anchorage in 20 fathoms, mud bottom, can be had south of the small island at the bend in the inlet. Local fishermen bound from Cordova Bay to Keete Inlet usually pass to the south of **Keete Island,** about 0.8 mile westward of **Keete Point,** the southern point of the entrance to the inlet.

Hetta Inlet extends 5 miles northward from Lime Point to the entrance of Sukkwan Strait, and has a width of about 2 miles. Then it trends in a general north-northwesterly direction for 11 miles to Gould Island, above which it is navigable for small craft only. Above Sukkwan Strait, the width of the inlet decreases gradually from 1.2 miles to 0.5 mile and less in places; there are apparently no outlying dangers. Considerable fishing for salmon is done in the inlet in season, and boats may be found in all of its parts.

Lime Point is the dividing point between Cordova Bay and Hetta and Nutkwa Inlets. The tip of the point is marked by a white marble formation which is conspicuous from southward. Three bare rocks lie about 0.2 mile southeastward of the point, with other rocks, sunken and awash, between.

Mud Bay, the small cove 2 miles north of Lime Point on the east shore of Hetta Inlet, is used extensively for anchorage during fishing season. The anchorage has a depth of 4 to 10 fathoms with mud bottom. There is a 1½-fathom rock 100 yards north of the islet on the south side of Mud Bay.

Alder Cove, the small cove 1 mile north of Mud Bay, is used by small craft for anchorage in 4 to 8 fathoms, mud bottom, during fishing season. There are no known dangers in the cove.

Copper City, on the eastern shore 5 miles above Lime Point, was at one time the site of an active mining settlement. It is now abandoned and there is no remaining evidence of the village.

Eek Inlet, on the west side of Hetta Inlet, at the northern side of Sukkwan Strait entrance, may be used by fishermen with local knowledge. A midchannel course leads to an anchorage in 8 fathoms, midway in the inlet, about 0.3 mile northwest of the narrow entrance.

Hetta Point, on the eastern side of Hetta Inlet, about 7.5 miles above Lime Point, is bold, rocky, and heavily wooded. The bight about 0.8 mile southward of the point, in which are two wooded islets, affords temporary anchorage. The cove eastward of the point affords anchorage for small craft having local knowledge of the area. There are numerous reefs and shoal soundings in the cove.

Copper Harbor, on the eastern shore, 10 miles above Lime Point, is about 1 mile long and 0.3 mile wide. A midchannel course leads to the head of the harbor, where there is anchorage in 10 to 20 fathoms. **Coppermount,** at the head of the bay, is the location of an abandoned mining project. Few signs remain of the salmon cannery, formerly located on the northern shore of the bay.

Simmons Point is at the south entrance to Copper Harbor. About 1.5 miles above the point on the eastern shore is the abandoned **Corbin Mine.**

Deer Bay, on the western shore about 2 miles above Copper Harbor, affords good anchorage in 5 to 16 fathoms; the midchannel course is clear. A flat extends nearly 0.2 mile from its head.

Jumbo Island, in the middle of the inlet, about 2.5 miles above Copper Harbor, is wooded. The channels on either side are about 300 yards wide, but the better channel is eastward of the island. The west channel should be attempted only at high water as there is a 1-fathom shoal in midchannel at the entrance.

Dell Island, about 1.2 miles above Jumbo Island and close to the eastern shore, is wooded. **Sulzer,** on the northwestern shore of Hetta Inlet, at one time a thriving mining settlement, is now entirely abandoned and no part of it remains. Anchorage can be had about 250 yards off what was once the village site in 14 to 16 fathoms.

Gould Island practically closes the inlet for a distance of 1.5 miles above Sulzer. **Gould Passage,** southward of the island, runs dry at about half tide and should not be attempted at any stage of the tide as a through passage into Portage Bay because of tidal currents and numerous

rocks and dangers at the east end of the passage. **Sulzer Passage,** northward of the island, is navigable for small craft, but foul for 1 mile above Sulzer, and the tidal currents have considerable velocity. It should be navigated only by those having thorough local knowledge.

Portage Bay, that part of the inlet above Gould Island, is about 1.5 miles long, with depths of 9 to 27 fathoms. From its head there is a trail to the head of Cholmondeley Sound, about 3.5 miles.

Sukkwan Strait extends 7 miles northwestward from Hetta Inlet to Sukkwan Narrows. It has good depths and few dangers and is entered by vessels of considerable size as far as the village of Hydaburg. **Eek Point,** on the northeast, and **Round Point,** the eastern extremity of Blanket Island, on the southwest, mark the southeastern entrance.

A good anchorage in Sukkwan Strait can be had in 10 to 15 fathoms, mud bottom, about 0.2 mile northwestward of **Saltery Point.**

Chart 8151.—Sukkwan Narrows has a least depth of 2½-fathoms in a narrow channel with rocky shoals on both sides. The maximum current is about 2 knots and sets northwestward with the flood and southeastward with the ebb. The channel is buoyed and its western entrance is marked by **Sukkwan Narrows Light (55°12.1′ N., 132°50.4′ W.),** 16 feet above the water and shown from a small white house on the northern end of Sukkwan Island.

A daybeacon is on the east side of the channel off Hydaburg, 950 yards 074° from Sukkwan Narrows Light. A pinnacle rock with a depth of 2½ fathoms over it is about 350 yards 202° from the daybeacon; it is marked by a buoy.

Hydaburg (pop. 251; P.O.) is a native village with a wharf on the northeastern shore of Sukkwan Narrows. There is a general store where limited supplies can be obtained. The Hydaburg Cooperative Association wharf, at the southeastern end of the village, has a face 140 feet in length, with a depth of 22 feet alongside. A salmon cannery and cold-storage plant are operated from the wharf. Fresh water is piped to the wharf; fuel oil, diesel fuel, and gasoline are stocked for the cannery. There is a small machine shop. In the basin north of the village there is a grid which can handle small boats.

The submerged ledge that makes out into the channel from the point just eastward of Hydaburg wharf has a depth of 16 feet about 225 yards south-southeast of the wharf; vessels drawing 15 feet or more should avoid this ledge when approaching or leaving the wharf.

Northward of Sukkwan Narrows, Sukkwan Strait divides into two parts known as South Pass and North Pass.

South Pass extends about 3.5 miles southwestward from Sukkwan Narrows to Tlevak Strait. It has good depths in a tortuous channel between numerous rocky shoals and dangers.

Scrag Islands, two wooded islands about 75 feet high, are on the east side of South Pass about 1 mile to the southwestward of The Narrows and are separated from Sukkwan Island only at high water. A reef with two bare rocks extends about 100 yards from Scrag Islands into the pass; it is marked by a buoy and kelp. A reef with 1¼ fathoms over it, marked by kelp, is about 0.3 mile northward of Scrag Islands; it is marked by a buoy. A kelp patch marks a 1-fathom shoal about 600 yards to the north-northeastward of Scrag Islands. Depths of 6 to 11 fathoms are found around this shoal. Small craft can find good anchorage in South Pass in the small bay on the southeast side, about 2.2 miles south-southwestward of Sukkwan Narrows. Good anchorage also is available for medium-sized vessels in 16 fathoms, mud bottom, in the bight on the same side of South Pass 1.4 miles from the narrows.

Lone Spruce Rock, on the southerly side of the southwest entrance to South Pass, is about 0.2 mile westward of a 75-foot island. It is a low, grass-covered islet. A rock with two knobs lies close-to, to the westward. A 1½-fathom spot is about 300 yards westward of the rock.

A light, 21 feet above the water and shown from a small white house on **Whisker Point,** the southern extremity of **Goat Island,** marks the northerly side of the southwestern entrance to South Pass.

Turn Rock, about 5 feet high and 20 yards in diameter, and marked by a daybeacon, is about 0.8 mile westward of the light.

North Pass, on the north side of Goat Island, is navigable by shallow draft vessels at high water slack with local knowledge. Numerous rocks and reefs must be passed close aboard until clear of North Pass to the westward. Tidal currents are estimated at 3 to 4 knots. Surveys indicate a least depth of 1 fathom at the shoalest point of the pass.

Natzuhini Bay, north of Hydaburg and Sukkwan Narrows, is navigable for large fishing vessels. However, owing to the many reefs and shoals in it and the lack of aids to navigation, it should not be attempted by strangers.

Chart 8152.—Kaigani Strait is the passage extending from Cordova Bay to Tlevak Strait and separating Long Island, and the group of islands extending northwestward of it, from Dall Island. **Howkan Narrows** is the narrow part of the passage from American Bay to above Channel Islands; it is endangered by several unmarked shoals and reefs. Ships from Dixon Entrance, bound through Tlevak Strait, should preferably use the broad channel through Cordova Bay eastward of Long Island and enter Tlevak Strait between Long and Jackson Islands.

Southward of American Bay, the strait is clear of dangers along a midchannel course and may be navigated easily with the aid of the chart. Northward of American Bay the channel is tortuous, narrow, and complicated by strong currents; in the absence of aids to navigation, it is not recommended for use by large vessels.

The channel through Howkan Narrows opposite the

deserted village of Howkan is about 250 yards wide and lies between a reef off Howkan, which uncovers 5 feet, and a reef off the western shore which has a depth of ½ fathom. The currents are strong here having an estimated velocity of about 3 knots. They are greatly affected by strong winds. Northward of Howkan, the channel leads westward of the Channel Islands, and extreme caution is necessary to avoid the dangerous shoals on each side of the channel. After passing **Keg Point** the course may be shaped as desired, being guided by the chart.

Chart 8146.—The southeastern entrance to Kaigani Strait is about 1.7 miles wide between Kaigani Point, on the northeast, and Datzkoo Islands, on the southwest. It is clear with the exception of the 1¼-fathom shoal 1 mile southeastward of Kaigani Point and the ¾-fathom rock about 0.5 mile eastward of the Datzkoo Islands.

Local magnetic disturbance.—Differences of as much as 3° from normal variations have been observed in the Daykoo Islands, and 4° in Kaigani Strait 1.2 miles northwest of Kaigani Point.

Kaigani Point, low and wooded, is about 0.6 mile westward of the southeast end of Long Island. A large rock, 18 feet high, is 0.7 mile northwestward of Kaigani Point and about 0.2 mile offshore.

Datzkoo Harbor is on the eastern side of Dall Island about 1.3 miles northwestward of **Datzkoo Point.** The entrance channel is clear and lies northward of two wooded islands. Anchorage can be had in 15 to 20 fathoms, soft bottom. A mud flat fills the head of the harbor.

South Kaigani Harbor is about 2 miles northwestward of the Datzkoo Islands. The entrance is constricted by reefs on the north side and a rock 5 feet high on the south side. The channel about 100 yards wide has a depth of 4½ fathoms.

Kaigani Harbor Entrance Light (54°45.0′ N., 132°43.2′ W.), 45 feet above the water and shown from a small white house, is on the point about 0.3 mile southeast of the entrance.

Two daybeacons are on the south side of the harbor, one at the entrance, and the other at the entrance to the cove about a mile northwestward of the light. Two fish-buying and trading post scows are anchored in the cove throughout the year. Supplies for fishermen, including food, gasoline, oil, and fresh water are available. Five hundred feet of mooring floats for small craft are anchored in 4 to 6 fathoms of water.

North Kaigani Harbor, close northward, is entirely exposed to southeasterly weather and the ocean swell, and is of no use as an anchorage.

The small bight about 0.8 mile northward of North Kaigani Harbor has an entrance difficult even for small vessels. Good anchorage may be had here in 5 to 10 fathoms. Very small vessels may anchor near the head in about 3½ fathoms.

Pond Bay is on the southwest side of Kaigani Strait. A wooded island is halfway toward the head of the bay with a clear channel on the north side. Anchorage may be had west of this island in desired depths up to 20 fathoms, soft bottom. However, a strong wind blows up the bay in southeasterly weather and, due to the danger from dragging, it is not recommended for anchorage.

Bolles Inlet is a narrow inlet on the northeast side of Kaigani Strait; entrance is 0.5 mile north-northeastward from a wooded islet 90 feet high. The entrance is very narrow and rapids occur here, with currents estimated to be at least 8 knots. It is reported that a logging camp was once located in the inlet and small craft used the entrance at high-water slack.

American Bay is on the west side of Kaigani Strait about 12 miles north-northwestward of Cape Muzon and 1 mile southward of Howkan. Good anchorage may be had a little northward of midchannel and about 400 yards 238° from the group of islands, known as **The Bay Islands,** which lie on the north side of the entrance. Small craft may find good anchorage in 5 fathoms near the north shore in the cove just eastward of the group of islands.

Howkan, on the eastern shore of Kaigani Strait, was at one time the largest village of the Hyda Indians in the area. All that remains to mark this site is some evidence of clearing. The Indians moved from this area to Hydaburg.

Mission Cove is the small bight just northward of Howkan on the northeast side of Kaigani Strait. Small craft can anchor here in 6 to 8 fathoms, although there is considerable kelp in the cove.

Howkan Reef, bare at half tide and surrounded by kelp, extends 300 yards southwestward from the shore at Howkan; at the southeastern end of the reef is a small island with Indian graves. There is deep water close to the reef.

The channel is 300 yards wide between Howkan Reef and an extensive kelp patch about 600 yards in diameter on the west side of **Howkan Narrows. Mill Reef,** between the kelp patch and the shore westward of it, shows at high water. There is no safe channel between the kelp patch and the west shore.

Chart 8148.—Channel Islands, about 0.5 mile northwestward of Howkan, are two wooded islands joined by a bare spit. A rock, with a least depth of 2¼ fathoms is in midchannel, 550 yards southward from the western end of these islands. The main channel is southwestward of the islands. The channel northeastward of Channel Islands is used by small craft going to and from Howkan, but is narrow in places between kelp patches.

Ham Cove, on the west side, about 0.6 mile westward of Channel Islands, has a very narrow entrance and can be entered only by small craft.

Pond Rock, which uncovers 4 feet and marked by kelp, is 0.5 mile northwestward of the western end of Channel Islands, and 0.5 mile east-northeastward of the entrance to Ham Cove. **West Mill Rock** is the eastern one of two islets close to shore about 1 mile northwestward of Channel Islands. A grassy islet from which a reef makes off about 0.2 mile, is 0.4 mile north-northwestward of West

Mill Rock. Kelp extends about 200 yards off the southwest side of **Shoe Island** close to the northwestern extremity of Long Island.

From the northwest end of Long Island, a group of islands and rocks extend about 5 miles north-northwestward, two of the larger ones being **Aston** and **Grand Islands.** A small timbered islet, 50 feet high, is about 0.9 mile northwestward from Grand Island; to the westward of this islet, about 0.3 mile, is a cluster of rocks about 15 feet high. A 1-fathom spot, with a buoyed 3-fathom spot close to the northward is 0.4 mile westward of these rocks.

Square Island, so called from its appearance, is westward of Grand Island and is the westernmost of a group of rocks and islets.

Grace Harbor, about 3.5 miles northwestward of Channel Islands, is on the western side of Kaigani Strait, near its northern end. When entering, give **Luke Point,** the northwestern point at the entrance, a berth of over 0.2 mile to avoid the rocks extending southeastward from that point, and then stand in for the inner bay or basin in midchannel. Anchor near the middle of the basin in 10 to 15 fathoms, soft bottom, taking care to avoid a ledge which extends 150 yards from the northern shore. Southwest winds draw through a low divide from the ocean.

Vesta Bay is on the western side of Kaigani Strait, near its northern end, about 4.5 miles northwestward of Channel Islands and appears to be clear in midchannel. **Vesta Point** is the northern point of the entrance. There is anchorage near the head of the bay in 15 to 20 fathoms, soft bottom, with scant swinging room. **Bushy Island,** small and wooded, is close to the headland between Vesta Bay and Rose Inlet.

Rose Inlet, about 21 miles northward of Cape Muzon, is on the western side of Kaigani Strait near its northern end, westward of Grand Island. Two groups of islands are in the entrance with the entrance channel between. A daybeacon marks the easternmost of the western group of islands and a light is on the east side of the outer island of the eastern group. There are three patches of light-colored cliffs on the north point of the entrance. The larger and more southerly patch is roughly triangular in shape.

There is a wharf at the head of the bay on the north shore, the face of which is 175 feet in length with 30 feet alongside. Fresh water is available, but no fuel or other supplies. Only the warehouse, of the buildings adjacent to the wharf, remains.

Large vessels make a starboard landing; small vessels usually round the buoy-marked shoal off the wharf and make a port landing. A shoal makes out to southwestward from the wharf. A rock, bare at lowest tide and marked by a buoy, is 240 yards southward from the wharf. A ledge extends 200 yards westward from the rock; the western end of the ledge is marked by a buoy. A rock, awash at low water springs, is about 50 yards southeastward of the prominent point on the north shore about 0.8 mile eastward of the cannery.

Chart 8152.—Tlevak Strait and Tlevak Narrows separate Sukkwan Island and Prince of Wales Island from Dall Island and from the group of islands northward of Long Island, and extend from Cordova Bay to Ulloa Channel. From Cordova Bay, the main channel of Tlevak Strait trends northwestward for about 10 miles to McFarland Islands and then northward for about 14 miles to Tlevak Narrows; the width of the strait varies from 1.5 to 4 miles. Islands are numerous and the shores are much indented.

The southeastern entrance to the strait, about 20 miles northward of Cape Muzon, is marked by **Tlevak Strait Light (54°57.1′ N., 132°44.6′ W)**, 20 feet above the water and shown from a small white house on the northeastern end of a wooded islet about 0.7 mile off the north end of Long Island.

Currents.—In Tlevak Strait, the flood current sets northwestward and the ebb southeastward. The estimated velocity of the current is about 3 knots. For daily predictions for places in the strait, see the Tidal Current Tables.

Sukkwan Island is on the northeastern side of Tlevak Strait and separated from Prince of Wales Island by Cordova Bay, Hessa Inlet, and Sukkwan Strait. It is mountainous and its rugged coastline is indented by numerous inlets. The western shore of the island, just outside of Dunbar Inlet and opposite the McFarland Islands, is very irregular and foul.

Lacey and Jackson Islands, on the north side of Tlevak Strait at the entrance from Cordova Bay, have been described previously in this chapter.

The group of islands extending 5 miles northwestward from the northwest end of Long Island has been described with Kaigani Strait.

Chart 8147.—Shoe Inlet, which indents the northwestern part of Long Island, is about 2 miles long and 0.2 mile wide. The inlet is clear except near the shore. Anchorage for small vessels can be had near its head. **Touchit Cove** is a foul bight on the northeastern side of Shoe Inlet just within the entrance.

Cleva Bay is an open bight on the northwestern end of Long Island and is of no importance as an anchorage.

Kasook Inlet, making into the southern shore of Sukkwan Island, 2 to 3 miles northwestward of Jackson Island, has a cluster of small wooded islands in its entrance, with a good, clear channel on either side. Just inside the islands the inlet divides. The northwestern branch is about 1.5 miles long in a northerly direction and a midchannel course is clear, except at a point about midway of its length, where a ledge projects from the east side three-fourths of the way across the inlet. On the northeast side, at the head of the inlet, good anchorage can be had in about 12 fathoms, soft bottom. The other branch has a northeasterly direction for about 0.8 mile to a bay from which a short arm extends southeastward. There is a good anchorage in about 10 fathoms, soft bottom, just inside the entrance to the short southeasterly arm, favoring the southerly shore.

Chart 8148.—McFarland Islands are a group of large and small islands 3.5 miles in extent, on the eastern side of Tlevak Strait off the west coast of Sukkwan Island, about 5 miles northwestward of Kasook Inlet. The southernmost island is bluff, high, and prominent. There are passages and fairly well-sheltered anchorages among the islands for small launches.

Dunbar Inlet, eastward of McFarland Islands, has numerous rocks and islets at the entrance; but a clear channel, about 0.2 mile wide with depths of 5 to 6 fathoms leads to a protected anchorage inside. Small craft can find good anchorage in the passage between Dunbar Inlet and Island Bay. A narrow passage northward of the islands off the entrance to Dunbar Inlet may be used by small fishing vessels.

When approaching from the southward via Tlevak Strait, care should be taken to avoid the 3¼-fathom shoal a little west of midchannel, between McFarland Islands and the western shore of Sukkwan Island.

Island Bay, the deep bight just northward of Dunbar Inlet, affords well-protected anchorage from all winds, except westerly, in depths of 6 to 7 fathoms, sticky to hard bottom. Swinging room is limited and large vessels should anchor farther offshore in greater depths.

Two miles northward of Island Bay is a second bight with a small island to the northwestward. An indifferent anchorage is about 0.2 mile offshore and 0.2 mile 120° from the south point of the island in depths of 8 to 12 fathoms, sticky bottom, but rather poor protection. The entrance should only be attempted with local knowledge.

Gui Kangulas (Profit Island) is a small prominent island, about midway between the McFarland Islands and the Corlies Islands.

Baldy Bay is on the west side of Tlevak Strait opposite the McFarland Islands and is easily approached when coming from Cordova Bay. The entrance is between High Point and Reef Point. It has two large arms known as View Cove and Coco Harbor. **High Point,** bold and rounded, is the southern point of the entrance to the bay. **Reef Islands** are a large group of low wooded islands about 0.8 mile northward of High Point. They are steep-to along the northern shore. **Reef Point,** the northern point of the entrance, is a long projecting point.

View Cove Entrance Light (55°03.2′ N., 132°57.8′ W.), 35 feet above the water and shown from a small white house on a skeleton tower on a rock, which bares at half tide, is about 0.5 mile southeastward of Reef Point.

Southward of Reef Islands and just inside High Point is a small inlet with two arms at the head. The western arm is rather deep and clear but the anchorage area is suitable only for small vessels; it is exposed to williwaws. The eastern arm offers fairly good anchorage for small vessels. The entrance is very narrow. Anchor in a central position in 4 fathoms, sticky bottom.

Windy Cove is a narrow inlet clear and deep but the entrance is scarcely 100 yards wide with a depth of about 1 fathom. Strong tidal currents prevail through this entrance.

Coco Harbor is the western arm of Baldy Bay. **Entrance Island,** off the entrance to the main reach, is a large island with a constricted passage to the north and south. Off this island are numerous rocks and islets which must be avoided when entering Coco Harbor. After passing these obstructions the channel is clear and deep to the head of the inlet.

About the head of Coco Harbor are anchorage depths of 12 to 20 fathoms, soft bottom, but heavy williwaws prevail.

View Cove, the northerly arm of Baldy Bay, extends nearly 5 miles inside Reef Point and is practically free of obstruction. The shores are generally steep-to. There are some off-lying rocks about the south and east shores of Clam Island. About a mile from the head of the cove on the south shore is a small rather prominent island with foul ground between it and shore.

A large stone quarry and rock crusher with a loading wharf are on the north shore of View Cove about 2 miles from Reef Point. Limestone is shipped to Seattle for use in making cement. The wharf has a face 354 feet long with a least depth alongside of 26 feet. This shoalest depth is close-in off the loading elevator and there is much deeper water elsewhere. A radio station is kept in operation here during the entire year.

Clam Island, extending off the southern shore of View Cove about 2.5 miles inside Reef Point, divides the head of View Cove into two parts. A light marks the eastern point of the island.

Northward of Clam Island an arm extends over 2 miles farther inland; southward of the island is a large circular bight about 0.8 mile in diameter. Eastward of Clam Island is a small cove offering fair anchorage for small boats.

Green Inlet is a small narrow inlet on the south shore of View Cove. It offers good anchorage, with sticky bottom, for small craft, but the entrance is shallow, running dry on minus tides, and large mud flats extend a long distance from the head; also, there are heavy williwaws.

In View Cove are three indifferent anchorages. In the bight southwestward of Clam Island, anchor about 0.3 mile from the head of the bight in 18 to 19 fathoms, hard bottom, with the western end of Clam Island bearing 034°, distant 0.5 mile. Off Clam Island, anchor in 13 to 14 fathoms, sticky to hard bottom, with the large bare rock off the island bearing 270° and distant 450 yards. At the head of the long arm, anchor about 0.3 mile offshore in 16 to 18 fathoms. At the head of the long arm the winds seem to blow harder than outside, which is especially true for southeasterly winds. Opposite Clam Island, although apparently an exposed position, is fair protection for larger vessels, although the swinging room is restricted. For large vessels the best anchorage is in the bight southwestward of Clam Island, where there is fair protection and good swinging room.

Chart 8151.—Corlies Islands are a group of low wooded islands about 1.8 miles in extent, on the northeastern side of Tlevak Strait, southward of the western entrance to South Pass, Sukkwan Strait. There is foul

ground among the islands and to the southward of them. There is a channel about the middle of the group for small craft with local knowledge.

A small-boat passage between Sukkwan Island and Corlies Islands is used by small fishing vessels. The entrance is easily approached from the south. The western shores of Sukkwan Island should be favored in order to clear the numerous rocks and small islets eastward of Corlies Islands, and when up to the northernmost of the Corlies Islands, steer a midchannel course to avoid the thick kelp patches.

Nichols Islands, 6 miles northward of Reef Point, are a group of wooded islands which extend in a northeasterly direction for 2 miles. **Fort Islet,** small and wooded, is the most northerly of the group.

The Sentinels, a scattered group of five small wooded islets and rocks which cover, are about 1 mile north-northwestward of Nichols Islands. A rock with 3 fathoms over it is 3.2 miles from the southwest point of Nichols Islands and slightly westward of a line from this point to Guide Island. This rock is light in color and bare of sea growth and can be seen on extreme low tide. It is large in extent and surrounded by deep water. There is no kelp marking the area.

Breezy Bay is on the west side of Tlevak Strait abreast Nichols Islands; it is 2 miles wide between Eolus and Boreas Points. It is divided into two arms, and there are several small islands and numerous rocks in the bay. It does not appear to afford an anchorage. **Eolus Point,** on the southeast side at the entrance, is high, steep, and rocky, and is joined to the shore by a narrow neck, thinly wooded. A wooded island is close to **Boreas Point.**

Farallon Bay is on the west side of Tlevak Strait, about 9 miles above McFarland Islands. Enter in midchannel. The bottom is rocky and very broken; southeasterly winds draw through it, and it is not recommended as an anchorage. Just eastward of the southeast entrance point of the bay is a high-water islet which shows from southward.

Halibut Nose is the promontory on the northeast shore of Tlevak Strait opposite Farallon Bay. It is irregular in outline and not so high and prominent as some of the other headlands in Tlevak Strait.

North Bay is on the western side of the strait, about 10.5 miles above McFarland Islands and 2.8 miles southward of Tlevak Narrows. **Hassler Point,** the northwest point of the entrance is timbered. **Cayman Point,** the southeast point of the entrance, is low at the extremity and rises to a knob, 0.4 mile from the beach, which is separated by a very low saddle from a ridge to the southward.

When entering North Bay, favor the southeast side and anchor near the head of the bay in 12 to 15 fathoms, soft bottom, with the high-water islet at the head, bearing about west. Southeast winds draw around Cayman Point and blow directly into the bay with severe squalls and williwaws.

An open bight on the northerly side of Hassler Point, has depths of 29 to 31 fathoms at the entrance, shoaling to 16 fathoms about 250 yards from the head. The northern side of the bight is formed by a wooded island, between which and the main shore is a cove with depths of 1 to 4 fathoms.

Guide Island, about 0.8 mile eastward of Cayman Point, is small, and wooded, and surrounded by kelp. Reefs extend northward from it.

Lively Islands are about 1.2 miles in extent, and wooded. There are several outlying rocks off the islands marked by kelp and mostly covered at high water. The currents have considerable velocity around the Lively Islands group, and swirls occur in places.

Lively Islands Light (55°13.7′ N., 133°05.0′ W.), 18 feet above the water, is shown from a small white house on the west side of the southernmost island of the group.

In passing Lively Islands, the channel westward of them is considered the main channel, favoring the Dall Island shore slightly. The channel northeastward of Lively Islands is deep and safe and is largely used by small craft bound northward; the dangers are charted.

Round Island, about 0.5 mile eastward of the northernmost large island, is a large grass-covered rock about 20 feet high, with a small clump of trees near its southwest end. It is steep-to on all sides.

Soda Bay is on the northeast side of Tlevak Strait to the northeastward of the Lively Islands.

Midway Island is a small wooded islet in the middle of the strait about midway between the northernmost of the Lively Islands and Block Island.

Block Island is heavily wooded; the south side of which is bold-to. The narrow passage northward of the island is foul, and the currents are unusually strong. A light is on the southwest side of the island.

Turn Point, at the northern extremity of Dall Island, is a bluff, wooded knoll.

Tlevak Narrows, locally known as **The Skookum Chuck,** is a narrow and comparatively deep passage between Block Island and Turn Point, and connects Tlevak Strait and Ulloa Channel. A ½-fathom shoal 0.4 mile 300° from Turn Point is marked on its south side by a buoy which is reported to tow under during the large tides. The channel southward of the buoy is the one generally used.

Good anchorage for small craft can be had in 4 fathoms, soft bottom, in the small cove on the north side of Tlevak Narrows, the entrance to which is about 0.5 mile northward of Turn Point.

Currents in the vicinity of Tlevak Narrows run very strong during the large tides; in the narrowest part the velocity is from 4 to 5 knots. Soon after passing through the narrows, the current is greatly diminished in strength, and beyond Guide Island and Meares Island it is almost imperceptible.

With the large tides there is very little slack, while with the small tides, slack water lasts from 10 to 30 minutes, and there is not much current for 1 hour on either side. For predicted times and velocities see the Tidal Current Tables.

Northeast of Lively Islands it is reported that the current sets constantly northwestward, being stronger when

the main stream west of the islands is setting northwestward. Small craft bound northward usually pass northeastward of the Lively Islands in order to take advantage of this constant set.

The current setting northwestward divides into two parts off the eastern end of Ulloa Island, one part setting northward of the island and the other setting with considerable strength into Meares Passage.

Ulloa Channel is 9 miles in length from Tlevak Narrows to Bucareli Bay. For a distance of 3 miles from Tlevak Narrows it leads between the islands at the northern end of Meares Passage and has a width of about 0.3 mile; and thence between Suemez and Prince of Wales Islands, where its width is about 0.3 mile at its eastern end and 1.2 miles at its western end at Cape Flores, where it joins Bucareli Bay.

Currents.—The flood current in the channel sets southeastward and the ebb northwestward. The estimated velocity of the current is about 3 knots. For daily predictions for places in the channel, see the Tidal Current Tables.

Ulloa Island, close to the western end of Tlevak Narrows, is wooded. The main channel is close southward of the island.

Anchorage in 10 to 15 fathoms, soft bottom, near Tlevak Narrows, can be had in Ulloa Channel, at the entrance to a small passage which is on the northwest side of the largest island north of Ulloa Island, between it and the main shore of Prince of Wales Island. Ulloa Island, and the 160-foot high island to the westward, can be passed on either side, but the channel north of Ulloa Island is foul.

Bush Islets, about 0.8 mile westward of Turn Point, consists of two rocks with a single tree on one of them. A wooded islet, 50 feet high and surrounded by kelp, is 700 yards northwest of Bush Islets. Two other islets are 0.2 and 0.3 mile, respectively, southwestward of Bush Islets.

Meares Island, about 1.8 miles westward of Tlevak Narrows, is the largest island in Ulloa Channel. A light is shown from the northern point of the island. The main channel is northward of the island, the north side of which is bold-to. A rocky islet is 275 yards southeastward of Meares Island, with rocks and kelp between.

Ridge Island, off the eastern extremity of Suemez Island, high and wooded, is joined to Suemez Island by a sandy neck, awash at high water. Off the south side of the island is a wooded islet, connected with the island by a spit, bare at half tide.

Waterfall, on the northeast side of Ulloa Channel about 0.4 mile northward of **Point San Antonio,** has a cannery and store at which some fishermen's supplies, gasoline, and fuel oil can be obtained. The cannery wharf has a face 250 feet long, with a depth of 24 feet alongside. Fresh water is piped to this wharf. The Standard Oil Company wharf, southward of the cannery wharf, has a face 70 feet in length and a depth of 28 feet. Vessels make a port landing at the cannery wharf and either a port or starboard landing at the oil wharf. Temporary anchorage may be had in 10 fathoms on the shoal westward of the cannery. Waterfall has radio communication during the canning season.

Port Refugio is a large bay, having two arms, on the west side of Ulloa Channel opposite the cannery at Waterfall. Its southeast arm, inside of **Point Bocas,** is 1 mile long, 0.2 mile wide, and near its head affords anchorage for small craft in about 12 fathoms. **Point Verde,** the northwestern point of the entrance, is wooded.

Anchorage for steamers may be had between the east shore of the southwest arm of Port Refugio and the island at its head, in 12 to 20 fathoms, sand or mud bottom. The dangers are charted; the chart is the guide.

San Adrian Islands, connected by a reef which bares, lie about 0.7 mile northward of Point Verde.

Adrian Cove, on the west side of Ulloa Channel, at its northern end, is open to northward and is of no importance.

Cape Flores, on the east side of Ulloa Channel at its northern entrance, is the northwestern point of **Joe Island,** which is wooded. Rocks bare at low water and foul ground, marked by kelp, extend 0.2 mile northward of Cape Flores. A lighted buoy marks the northwestern extremity of the foul ground. The channel on the northeast side of Joe Island is largely used by small craft.

Chart 8152.—Bucareli Bay, about 50 miles northwestward of Dixon Entrance, extends about 20 miles northeastward from its southwestern entrance between Cape Bartolome and Cape Felix. Baker, St. Ignace, Lulu, and San Fernando Islands form its western shore and Suemez and Prince of Wales Island form its eastern shore. The various passages between these islands connect the bay with the sea, the Gulf of Esquibel, or Cordova Bay. They are used by small vessels and small craft as a protected route when proceeding along the outer coast between Dixon Entrance and Sumner Strait.

Currents.—The tidal currents in Bucareli Bay set northeastward on the flood and southwestward on the ebb. The estimated velocity of the current is about 2 knots. For daily predictions for places in the bay, see the Tidal Current Tables.

Chart 8158.—Cape Bartolome Light (55°13.9′ N., 133°36.8′ W.), 163 feet above the water and shown from a small white house on the south end of one of the islets south of Cape Bartolome, marks the entrance to Bucareli Bay.

Cape Bartolome, the southern extremity of Baker Island, has several storm-swept islets, some partly wooded, lying off the main shore. The southernmost wooded islet, 300 feet high, slightly higher than those close to the cape, shows prominently from offshore. The cape rises rather sharply. A small rounded peak, 2 miles northward from the cape, with higher peaks on either side, shows prominently when other peaks are clouded. In rounding the cape, the outer wooded islet should be given a berth of about 1 mile.

The rocks and cliffs northwestward of Cape Bartolome are black in color, while those southeastward are whitish gray, and it is reported that this characteristic is of con-

siderable assistance in identifying the locality when making the coast in thick weather.

Baker Island, forming the western side of the southern end of Bucareli Bay, is cut up by numerous bays and inlets. The shore is generally rocky; that along the outer coast is precipitous and marked by ragged ledges and deep clefts. The interior is rugged and mountainous and generally thickly wooded.

Fortaleza Bay, on the west side of Bucareli Bay, about 4.5 miles northward of Cape Bartolome, is a small open deep-water bight. **Lake Fortaleza,** with an elevation of about 12 feet, empties into the bay. **Thimble Cove,** about 0.8 mile northward of Fortaleza Bay, is a small exposed bight.

Port San Antonio, on the western side of Bucareli Bay, about 6.5 miles northward of Cape Bartolome, has two arms at the head, one extending in a northerly and the other in a southerly direction. The midchannel is clear, but a rocky shoal which uncovers 7 feet, is 0.3 mile 242° from **Point San Roque,** the north point at the entrance. Depths in the bay decrease from 30 fathoms at the entrance to about 14 fathoms at the head. Small craft can find anchorage in the north arm in 5 to 7 fathoms, and in the south arm in 10 fathoms, sand bottom. The north arm has a low shoreline with gravel beach.

A fish-buying scow is anchored at the head of the north arm from May 1 to September 15. Supplies for fishermen, including provisions, gasoline, fuel oil, and fresh water are available. There is 250 feet of mooring float for small craft. Radio communications are maintained with Alaska Communication System.

Port Asumcion, on the west side of Bucareli Bay, 9 miles northward of Cape Bartolome, offers protected anchorage in 17 to 21 fathoms, sand bottom, near its head. The midchannel is clear.

Cape Felix is at the south end Suemez Island. The depths off the cape are comparatively regular and good, but to the eastward, foul ground extends alomst 2.5 miles offshore. Cliffs well up on the mountain side, and a steep light-colored cliff a little to the northeastward of the cape, are the most prominent landmarks. Northeastward of the cape is a small section of cliff of columnar formation, somewhat unusual for this section of Alaska. From the cape the shoreline trends in a northerly direction, forming the east side of Bucareli Bay.

Port Santa Cruz is on the east side of Bucareli Bay 5 miles northward of Cape Felix. The north shore is steep and rocky, with detached rocks close-to, while the rest of the shoreline is generally low, with rocky, gravel, or sand beaches. A fish-buying scow anchored at the head of the port operates from May 1 to September 15. All fishermen supplies including provisions, gasoline, fuel and lubricating oil, and some gear are available. There is 200 feet of mooring float for small craft. Fresh water can be obtained at the float. Radio communications are maintained with Alaska Communication system. **Labandera Rock,** a kelp-marked shoal 300 yards in extent, with a depth of 1½ fathoms, is midway between **Point Rosary** and **Point San Jose,** the two points at the entrance. A rock which bares at low water is about 0.7 mile east-northeastward from Point Rosary and 250 yards off the islet fronting **Point Isleta.** With a moderate swell, the breakers on this rock can frequently be seen at night.

In entering, round Point Rosary or Point San Jose at a distance of 0.2 mile and head for the point on the north side of the bay 1 mile inside the entrance. Round this point at a distance of 300 yards and select anchorage as desired in 14 to 17 fathoms, mud bottom. Anchorage with more swinging room may be had to the southward of the point in 17 to 19 fathoms, mud bottom. The channel to the northward of Labandera Rock is preferable.

Point Arboleda is a low point about 2.2 miles northward of the entrance to Port Santa Cruz. Several outlying islets and rocks make it necessary to give the cape a berth of 0.5 mile in rounding it. **Point Quemada** is midway between Point San Jose and Point Arboleda.

Point Fula, Point Remedios, and **Point Barrigon** are headlands on the northwest shore of Suemez Island.

Port Dolores is on the easterly side of Bucareli Bay, 2 miles east-northeastward of Point Arboleda. It has generally broken bottom with a sunken reef, 350 yards in extent, in its center about 0.4 mile inside the entrance. Its use is recommended only for small craft, and they can find anchorage in about 12 fathoms 0.4 mile from the head. The anchorage is exposed to westerly winds.

Point Arucenas, the headland on the north side of Port Dolores, and **Point Cangrejo,** about 1.6 miles eastward of Point Arucenas, are wooded.

Cabras Islands are a small, wooded group, about 1.5 miles northeastward of Port Dolores. A reef that uncovers 5 feet and marked by kelp lies nearly 0.5 mile southwestward from this group.

St. Ignace Island, on the northwest side of Bucareli Bay about 11 miles from Cape Bartolome, is bold, and wooded. The eastern and northeastern shores are mostly rocky, while the west and northwest shores are gravel. A light is shown from a skeleton tower on **St. Ignace Rock** about 0.8 mile northeastward of **Silvester Point,** the northeastern end of St. Ignace Island.

Port Mayoral, the passage between St. Ignace and Baker Islands, has depths of 6 to 12 fathoms, with irregular bottom. **Cristina Island,** small and wooded, and a cluster of high-water islets, are westward of midchannel at the entrance, with a deep-water passage on either side. Foul ground extends 300 yards off the southern end of the island and for 550 yards off **Canal Point.** The northern entrance is obstructed by the Santa Rita group of islands between which and the St. Ignace Island shore is a narrow channel less than 50 yards wide. The channel between Santa Rita and Baker Islands is passable at high water by rowboats and similar craft.

Chart 8155.—San Juan Bautista Island, in the northern part of Bucareli Bay, and separating it from San Alberto Bay, is densly wooded, and has two prominent summits.

Agueda Point, at the northeastern end, and **Diamond Point,** at the southwestern end of the island, have no special features as landmarks. Deep-draft vessels passing

westward of San Juan Bautista Island should exercise caution in the area.

Point Miliflores, bold and wooded, is the southeastern point of San Juan Bautista Island. **San Juanito Island** lies close off the point. The island is wooded and from north and south directions shows clear of San Juan Bautista Island and is a prominent landmark. Deep water extends close to the point and island.

Port Estrella lies eastward of Cape Flores. Foul ground extends for about 0.2 mile southward of **Point Providence,** the north point of the entrance. Anchor near the head of the bay in 7 to 9 fathoms. Caution is necessary on entering, as shoal water makes out from each side of the bay.

Tranquil Point, Point Batan, and **Point Lomas** are headlands without any prominent features on the southeastern shore of Bucareli Bay, to the eastward of San Juan Bautista Island.

Port Caldera, about 4.5 miles northeastward of Cape Flores, is open to the northward. It affords anchorage for small craft. A 6½-fathom spot is in the center near the entrance. Foul ground extends about 300 yards off **Point Iphigenia,** the northeast headland at the entrance.

Trocadero Bay, locally known as **Big Harbor,** extends about 9 miles eastward from the head of Bucareli Bay, with a greatest width of 3 miles. In the entrance is a group of islands, of which the largest is **Madre de Dios Island,** high and wooded. The islands are bold-to, with a few outlying rocks, and the passages between them are mostly of good depth. Near the head of Trocadero Bay, islands and rocks are numerous and the channel becomes more difficult. An abandoned copper mine is on the north side of the bay 3 miles from its head. From the head of the bay is an easy portage to Twelvemile Arm, Kasaan Bay, on the east side of Prince of Wales Island. In entering Trocadero Bay the chart is the guide.

The **Ladrones Islands** are a group of small wooded islands in the entrance to Trocadero Bay. **Toti Island,** a small wooded island, is 0.5 mile northward of Madre de Dios Island.

Port St. Nicholas is northward of Trocadero Bay. **Coronados Islands,** a group of islands, are midway in the entrance, and rocks and reefs, with two channels between, extend to the northward. **Rancheria Island** is southward of and close to **Point Miraballes.** Dangers are shown on the chart. Northwestward of Port St. Nicholas is a peak of a light-green color in the summer, which shows conspicuously from northward and southward.

Balandra Island, small, and wooded, is about 0.6 mile eastward of Agueda Point, at the junction of Bucareli Bay and San Alberto Bay. Foul ground extends 250 and 100 yards off the east and west ends, respectively. A 2½-fathom spot is 0.2 mile northeastward of the island. The channel between Balandra Island and San Juan Bautista Island has a least found depth of 4½ fathoms.

San Alberto Bay, with numerous shoals and broken areas, extends 7 miles northward from Bucareli Bay to San Christoval Channel.

San Fernando Island, on the west side of San Alberto Bay and on the northeast side of Portillo Channel, is about 6.5 miles in diameter, with low rocky shores cut up by numerous small indentations and bights. The island is covered with timbered hills and ridges.

Ursua Channel separates San Fernando and San Juan Bautista Islands and connects Bucareli Bay and San Alberto Bay. Midchannel depths are good. The principal dangers are a 4½-fathom shoal about 1.0 mile west by north of Diamond Point, on the southwest coast of San Juan Bautista Island; the shoal ground which extends almost 0.8 mile southward from **Point Amargura,** the southern point of San Fernando Island; and the shoal ground which extends about 0.4 mile off **Point Eugenia,** the middle point on the northwestern side of San Juan Bautista Island. From this point to the shoal spot, 0.5 mile westward of Agueda Point, the San Juan Bautista Island shore should be given a berth of at least 0.4 mile. Irregular bottom, with shoal spots, extends about 0.6 mile off the San Fernando Island shore, near the northern end of the channel. The channel eastward of San Juan Bautista Island is more generally used.

Ballena Islands, two in number and wooded, are about 1.2 miles northeastward of Balandra Island and about the same distance southwestward of Fish Egg Island. Between Ballena Islands and Fish Egg Island the bottom is foul. A reef, with a least depth of 1½ fathoms, is 0.4 mile southwestward of the western Ballena Island, with an extensive kelp patch between.

Ballena Island Shoal, with a least depth of 1¾ fathoms, is 0.6 mile westward of the western Ballena Island. It is marked on its western side by a lighted buoy.

Balandra Shoal, about 1 mile westward of the western Ballena Island, consists of two small areas 0.2 mile apart, having a least depth of 1 fathom in the northern area, and ¾ fathom in the southern area, with deep water between. The northerly area is marked by a buoy on its eastern side. The usual course in passing Balandra Shoal leads eastward of it, between the buoys marking it and Ballena Island Shoal.

Fern Reef, marked by kelp, is about 1.5 miles northwestward of Balandra Shoal and about 1 mile off the San Fernando Island shore. Two rocky heads, 0.2 mile apart and bare at low-water springs, are conspicuous. **Fern Point** is on the eastern extremity of San Fernando Island.

Parida Island is a prominent wooded landmark in the middle of San Alberto Bay. **Parida Island Reef** is 0.5 mile southward from Parida Island. One head bares at low-water springs. A depth of 4 fathoms is found 0.5 mile southeastward of this reef; the depth may be less.

Alberto Islands are northward of Fish Egg Island and Klawak Reef. The southernmost island is about 1.8 miles northward of Fish Egg Island and the same distance northeastward of Parida Island; it is wooded.

Alberto Reef extends 0.4 mile westward from the southernmost of the Alberto Islands; its highest point uncovers 5 feet. A 5-fathom channel separates this reef from Alberto Island; the deepest water is found 100 yards off the island.

Wadleigh Rock lies 0.5 mile eastward of Alberto Islands and consists of two reefs about 100 yards apart.

The west reef bares at half tide and the east reef at low water. The shoal is about 0.2 mile long in a northerly direction, steep on the west side, and can be passed 100 yards off.

Three rocky patches, covered by about 5 feet, lie about 1 mile north-northwestward of Parida Island. They are marked by a lighted buoy off the northernmost patch. These rocky patches are usually marked by kelp. The range of the southwest end of Parida Island and the northeast end of San Juan Bautista Island passes a little northeastward of the patches.

The Witnesses, locally known as **Hour Islands,** are two wooded islets 1.8 miles northward of Parida Island. **Witness Rocks,** about 0.9 mile westward of The Witnesses, are nearly covered at high water.

Abbess Island, at the north end of San Alberto Bay, about 0.5 mile westward of **Wadleigh Island,** is surrounded by foul ground and off-lying islets. A winding, unmarked channel lies between Abbess Island and Wadleigh Island. This channel has many dangers and is only suitable for small craft with local knowledge.

Shinaku Inlet makes off from the northern end of San Alberto Bay and connects with Big Salt Lake and Klawak Inlet. There is much foul ground in the inlet, and the passages leading to Big Salt Lake and Klawak Inlet are only good for small craft with local knowledge.

Klawak Inlet extends in a northerly direction from the head of Bucareli Bay for about 6 miles to the entrance of Big Salt Lake. The inlet has two entrances, the entrance from Bucareli Bay is southward of Fish Egg Island; the entrance from San Alberto Bay is northward of Fish Egg Island.

Cape Suspiro is the low wooded point on the eastern side of the southern entrance to Klawak Inlet. **Port Bagial,** a small cove on the east side of Cape Suspiro, has depths of 4 to 5 fathoms westward of the islands on the east side.

Fish Egg Island, at the southern end of Klawak Inlet, is low and wooded. Shoals extend off the southern end of the island to the Ballena Islands. **Fish Egg Reef,** which extends for 350 yards southeastward of the southeastern point of the island, is marked by a lighted buoy at its outer end. **Cole Island,** a low, wooded island, is in the bight in the northeast side of Fish Egg Island.

Craig Shoal, marked by a lighted buoy, is a sunken rock with 1 fathom over it, about 0.6 mile northward of the cannery at Craig. The channel eastward of the shoal is deep; the channel to westward has a least depth of 4½ fathoms in midchannel.

Craig (pop. 273; P.O.) is a city on the island at the south end of Klawak Inlet southeastward of Fish Egg Island. Located here are a sawmill, radio station, several general stores, and a hotel. A machine shop equipped to handle ordinary repairs to small craft is on the east side of the island where boats are beached on the sand flats for repairs. There is a float here, and two floats off the town, where small craft tie up; deep draft vessels go to the former cannery wharf.

The wharf of the former cannery, reported in poor repair in 1960, has a 146-foot face with a depth of 20 feet alongside. The approach to the wharf is difficult on account of a reef, marked by a buoy off the corner. Large vessels approach from the northward and make a port landing. It is reported that the flood current sets toward the wharf and the ebb current sets off the wharf. Fresh water is available. The Standard Oil Company wharf has a depth of 16 feet alongside and the Union Oil Company wharf has a depth of 12 feet.

A Federal project provides for a mooring basin 11 feet deep in **South Cove,** on the east side of the island. In October 1957, the controlling depth was 10½ feet in the entrance channel and basin. A lighted range marks the channel. There is a government and a city float in South Cove.

Craig has regular mail communication with Wrangell and Ketchikan and with other settlements on the west coast of Prince of Wales Island. There is regular airplane service daily throughout the year.

Clam Island is a low wooded island, about 1 mile northward of Fish Egg Island. **Klawak Reef,** the southern end of which is marked by a lighted buoy, consists of four groups of rocks, extending in a southwesterly direction from the west end of Clam Island.

A channel, about 200 yards wide, with depths of 11 to 20 fathoms, separates the reef from the shoals off Fish Egg Island. A buoy marks the west end, and a lighted buoy the east end of the north side of the channel.

Entrance Point is a low wooded point about 0.2 mile eastward of Clam Island. A channel leads between Entrance Point and Clam Island into the bay southeastward of the Alberto Islands. The channel is foul, unmarked, and should not be entered without local knowledge.

Klawak Island is near the head of Klawak Inlet and is separated from the eastern shore by **Klawak Harbor.** A 2-fathom spot, marked by a lighted bell buoy, is about 0.2 mile westward from the southern end of the island. The harbor is reported to freeze over at times during the winter. The approach to Klawak Harbor is rocky and narrow.

Klawak Island Light (55°33.5′ N., 133°06.2′ W.), 20 feet above the water, is shown from a small white house on a skeleton tower on a concrete pier, on the northeastern extremity of a reef extending northward of Klawak Island. A daybeacon, about 250 yards northward of the light, marks the south end of a reef extending southward of **Peratrovitch Island.**

The entrance channel, about 200 yards wide, is between the light and the daybeacon. A daybeacon about 175 yards southeastward of the light, marks the west side of a rocky shoal on the east side of the harbor channel. This daybeacon should be given a berth of not less than 35 yards. A small anchorage is in the bight southward of the village, from the south end of which is a highwater pass to Klawak Inlet for canoes.

Klawak (pop. 251; P.O.) is a city on the eastern shore of Klawak Harbor. Two general stores, a sawmill, and two canneries are here. Klawak has regular communication by mail launch with Wrangell and Ketchikan, and with other settlements on the west coast of Prince of

Wales Island. There is daily air communication with Ketchikan.

The wharves of the Klawak Oceanside Packing Company are the most northerly on the east side of the harbor. There is a controlling depth of 16 feet at the face. The wharf of the West Coast Packing Company farther south on the eastern side of the harbor has a 60-foot face and a controlling depth of 17 feet alongside.

The head of Klawak Inlet consists of a series of irregular flat islands broken by a great number of intricate channels. Beyond these is **Big Salt Lake**, which is separated from the inlet by an island, on both sides of which are narrow channels obstructed by ledges. These serve to dam the waters of the lake. The flow of water into the inlet from the lake at the lower stages of the tide is reversed near high water. A slack water occurs about 2 hours before and after high water at Klawak, at which time a draft of about 8 feet can be taken into the lake. The passages above Klawak are intricate and foul in places, and should not be attempted without local knowledge. Guides can be obtained at Klawak.

A large amount of fresh water discharged from the lake causes severe ice conditions in the colder months of winter. There are times each winter when the harbor cannot be used by small craft. At these times, outside communication with Craig is by the highway extending between the two settlements.

Chart 8158.—Port Real Marina, the passage on the north side of Baker Island, connects Bucareli Bay with Siketi Sound and thence with the Pacific Ocean. It is about 1 mile wide, but its use is not recommended for any except small craft. The western entrance is constricted; the bottom is very irregular. The eastern entrance is also constricted by Rana Reef.

Rana Reef extends about 0.7 mile in a northerly direction from a point about 500 yards north of **Point Gorda,** the northwest point of St. Ignace Island, almost to **Point Arrecife,** the southeast point of Lulu Island. There are several rocky heads on the reef, the two highest of which are about 8 feet high. There is a channel at each end of the reef, but the one to the southward is reported to be the best, giving the St. Ignace Island shore a berth of 200 to 400 yards.

Lulu Island, which forms the northern shore of the passage, is less than 1 mile northward of Baker Island. It is a large irregularly-shaped mountainous island with summits ranging from 800 to 1,018 feet in elevation.

Santa Rita Islands are between St. Ignace and Baker Islands, and form a group of five low, irregularly-shaped, wooded islands. The elevation of the largest is 250 feet. Rocky shores predominate.

Anchorage, reported to be the best in the vicinity, may be had in 12 fathoms in the bight between the largest Santa Rita Island and St. Ignace Island.

Coposo Island, in midchannel near the eastern end of the passage and about 0.5 mile northward of the largest Santa Rita Island, is small and wooded and 120 feet high. It shows prominently from easterly and westerly directions. Foul ground extends westward from the island with a rock with 1 fathom over it about 300 yards 268° from the center of the island.

Sola Rock, 0.5 mile southwestward from Coposo Island, is a pinnacle rock which uncovers 4 feet.

Pigeon Island, between Baker and Lulu Islands, off the northwest end of Baker Island, is wooded. A small wooded islet is close to its southeast shore, and a group of small rocky islets and sunken rocks are off its southern shore.

Paloma Pass is between Pigeon Island and Lulu Island. This pass and the pass southward of Pigeon Island have least depths of 3½ fathoms in midchannel, but the channels are winding and lined with dangers.

In entering from the Pacific, pass the south end of Cone Island at a distance of about 0.5 mile, avoiding the foul ground which extends off the Baker Island shore. Pigeon Island may be rounded on the northward side through Paloma Pass or through the pass to the southward. In Paloma Pass shoal water extends for 180 yards in an easterly direction from the north end of Pigeon Island. Halfway from either end of the pass, rocks awash extend for 200 yards from the Lulu Island shore. At this place the channel, about 40 yards wide, favors the Pigeon Island shore. Near the southern end of the pass is a 3½-fathom spot on the west side of the channel.

The pass to the southward of Pigeon Island is a more direct route, passing between two small islets, the westerly one of which is in about midchannel. Favor the eastern islet in passing through. The pass is about 40 yards wide and has a depth of 3½ fathoms. To the westward of the western islet is a narrow channel with 3 to 3½ fathoms. Coposo Island may be passed on either side at a distance of about 300 yards. The southern channel appears preferable. In approaching Coposo Island, favor the north shore of the passage to avoid Sola Rock.

Portillo Channel connects Bucareli Bay at its northern part with the Gulf of Esquibel. It is of irregular width, about 2.5 miles across the entrance and about 1 mile wide halfway between the ends. There are many islets in the channel, the southern part of which is shoal; the bottom is irregular, and there are numerous kelp patches. The northern half is comparatively clear. The channel may be used by small craft, but local knowledge is desirable for safe navigation.

The currents in the channel flow north and south with an estimated velocity of about 2 knots.

Reef Point, on the Lulu Island shore, is low and inconspicuous.

San Clemente Island, about 1.5 miles from the southern entrance close off the shore of San Fernando Island, is wooded and about 108 feet high. The channel to the eastward is shoal and numerous rocks and reefs extend to the northward.

Point Espada Light (55°28.4′ N., 133°24.7′ W.), 16 feet above the water, shown from a small white house, is on the westerly side of San Clemente Island.

Arboles Islet, near Lulu Island shore about 1 mile northwestward of San Clemente Island, is 90 feet high and wooded.

Snail Point, the western extremity of **Caracol Island** off the eastern shore, is 80 feet high, wooded, and conspicuous.

Point Delgada, on the Lulu Island shore about 1.5 miles from the northwest entrance, is a gravel spit, grass-covered inshore and conspicuous from the eastward.

Abreojo Rocks are about midway between the two points of the northwest entrance; the highest is 6 feet. **Quitasueno Rock,** 12 feet high, is about 0.4 mile eastward of Abreojo Rocks. A 4-fathom spot is about 0.5 mile westward, and a 3-fathom spot is about 0.5 mile northward of Abreojo Rocks.

Animas Island, close to **Point Animas,** is a small wooded island 118 feet high. Foul ground extends in a northerly direction parallel with the San Fernando Island shore.

Point Santa Gertrudis, the northern extremity of Lulu Island, is a low wooded point at the northwest entrance to Portillo Channel.

Chart 8157.—San Christoval Channel is the passage leading westward from San Alberto Bay to the Gulf of Esquibel. There are numerous islands, reefs, and shoals with three passages between them, all of which present difficulties for vessels of any size, owing to the narrowness of the passages and the strength of the currents. The dangers, mostly marked by kelp in summer, are shown on the charts.

Catalina Island, near the eastern end of San Christoval Channel 0.5 mile off the southerly shore, is small, 140 feet high, and wooded. Rocks and foul ground extend nearly 0.4 mile off the northern and eastern sides of the island.

Piedras Island, 0.6 mile northward of Catalina Island, is a wooded islet, 75 feet high. A reef marked by a buoy, extends 200 yards northward from the island.

San Christoval Rock, with 1 fathom over it and marked by a lighted bell buoy off its southeast side, is about midway between Piedras Island and the easternmost Hermanos Island. The rock is surrounded by a heavy bed of kelp which tows under when the current is running strong.

Cruz Islands are a group, 1.2 miles long, level, and wooded, close to the south shore of the eastern end of San Christoval Channel, with deep water between them and shore.

Cruz Pass, between Cruz Islands and San Fernando Island, affords a passage for small craft through San Christoval Channel; however, this pass is seldom used since the passage northward of Rosary Island is more direct and less difficult to navigate.

Hermanos Islands, four in number, small and wooded, are about 0.5 mile northward of Piedras Island. Range daybeacons on the northern islands, mark the channel northward of Cruz Islands.

Point Ildefonso is the low wooded point of the island eastward from the Hermanos Islands. **Rosary Island,** the largest island of the group is near the northerly shore of San Christoval Channel. All of the islands of the group are low and wooded.

The channel on the north side of the Rosary Island group is used by small craft, who follow the general trend of the main shore at a distance of about 250 yards.

Larzatita Island, 115 feet high and wooded, is the westernmost of the islands near the middle of San Christoval Channel; there is a good channel on either the east or west side. **Tuft Rock,** small, and bare except at extreme high water, is 400 yards southeastward of Larzatita Island. A rocky patch, with 3¼ fathoms over it and marked by a buoy on its east side, is about 350 yards eastward of Tuft Rock.

Larzatita Island Reef, marked by kelp and awash at half tide, is 300 yards northward of Larzatita Island. Its northern extremity is marked by **Larzatita Island Reef Light (55°35.1′ N., 133°19.6′ W.),** 22 feet above the water, is shown from a small white house on a skeleton steel tower on a concrete pier.

Point Santa Lucia is the eastern of four points at the northern extremity of San Fernando Island, westward of Cruz Islands. Foul ground extends about 0.2 mile northward from the point. A small open cove, with depths of 8 to 24 fathoms, is westward of the point.

Palisade Island, a low wooded island, is separated from San Fernando Island by a channel about 100 yards wide, with depths of 1½ to 2½ fathoms. Foul ground extends to the northward and northwestward of the island for about 400 yards. **Palisade Point,** the extremity of the small island close to and northward of Palisade Island, shows prominently from westward. Shoal spots are about 0.5 mile northward and northeastward of the point.

Point San Pasqual and **Point Santa Rosalia** are low wooded points on the northern shore of San Fernando Island. A small open cove, with depths of 15 to 19 fathoms, is between the points.

Charter 8158.—Cape Bartolome, the southern extremity of Baker Island, has been described earlier in this chapter. About 3 miles northwesterly from the cape is a low headland with a pinnacle rock, 50 feet high, close to the beach. There are several dangers in the vicinity, the outermost of which is about 500 yards offshore. All known dangers are shown on the chart.

Cape Chirikof, a prominent headland with a group of rocky islets close-to, is about 4.8 miles northwestward from Cape Bartolome. A small bay about 1.4 miles long in a northerly direction and 0.5 mile wide at the entrance, is eastward of the cape. At the west side of the entrance are two small rocky islets. A rock which bares is 285 yards 200° from the southern islet. The head of the bay is shoal for nearly 0.4 mile. Small vessels find temporary anchorage in 6 fathoms, about 1 mile from the entrance, but the southwest swell makes in heavily.

Granite Point, about 0.8 mile northward from Cape Chirikof, is a rocky point with light-colored cliffs and ledges. From Granite Point the shore trends northeastward for about 1.4 miles to a small cove. At the entrance to the cove, are two rocks; the outer one, almost

in midchannel, bares 4 feet. A 3¼-fathom spot, usually marked by kelp, is 300 yards from the easterly shore at the entrance. A 13-fathom channel is between this spot and the outer rock. A rock which bares 3 feet is 0.7 mile northward of the entrance and about 700 yards offshore. Depths of 6 to 13 fathoms are found within the bay. Shoal water extends 250 yards from the head of the bay.

Veta Bay, an open bight 3 miles northeastward of Granite Point, with depths of 7 to 13 fathoms, is too exposed for safe anchorage. At the head of the bay is a group of small rocks, awash at high water. Close to **Veta Point** on the northwest shore of the bay are two small islets off which kelp extends for 350 yards.

From Veta Point the shoreline trends in a westerly direction for about 1 mile, then northward for 0.3 mile, forming the headland, the northern extremity of which is Outer Point. **Arcada Rock,** locally known as **Arch Rock,** 130 feet high, is close to the southern end of the headland. At times kelp extends about 0.6 mile southwestward from the rock.

Outer Point, about 3.5 miles northward from Granite Point, is a projecting rocky point, 0.2 mile to the eastward of which is a prominent knob 500 feet high, separated by a divide from high land to the eastward. Foul ground extends 0.6 mile north-northwestward from the point. A bank of considerable area, with depths of 12 and 14 fathoms, is 2 miles westward of the point. Although closely developed, lesser depths may exist.

Gaviota Rock, about 40 feet high, is the largest of a group of rocky islets, about 1 mile northward of Outer Point. Breakers are found 0.2 mile northward of the islets. The bottom is shoal and irregular for about 0.6 mile from the islands. Foul ground is between the islets and the points to the eastward.

Cone Island, 2.5 miles northward of Outer Point, is on the northwestern side of the Pacific entrance to Port Real Marina, and on the southeastern side of the entrance to St. Nicholas Channel. It has several summits, the highest is 1,120 feet in elevation and centrally located. The southern end of the island is clear of off-lying dangers. Kelp extends for 200 to 300 yards off the northwestern and eastern shores. From the northern point of the island, shoal water extends in a northeasterly direction for 0.5 mile. **Siketi Point** is at the southwestern extremity of Cone Island.

Siketi Sound, between Cone Island and Baker Island, is the Pacific Ocean entrance to Port Real Marina. The southern part of the entrance is obstructed by the **Gaviota Islets**; the remainder of the sound is clear. At the northwestern end of the sound a narrow channel leads to St. Nicholas Channel, passing close along the Lulu Island shore avoiding extensive reefs which make off from the northern end of Cone Island.

Noyes Island, about 6 miles northwestward of Baker Island, is mountainous with rugged steep cliffs along the west shore. **Noyes Peak,** a triple-headed peak on the northern part of the island, is a very conspicuous landmark and during clear weather has been seen from 50 miles offshore.

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St. Nicholas Point, the southeastern extremity of Noyes Island, is about 5.5 miles eastward from Cape Addington. The shoreline between the cape and the point forms a large open bight, from the head of which kelp extends about 0.3 mile offshore. The shoreline is fringed with rocks. From St. Nicholas Point the shoreline turns northward, forming the west side of St. Nicholas Channel.

Cape Addington is the southwestern extremity of the narrow tongue of land which for 2 miles is less than 0.5 mile in width and forms the southwestern end of Noyes Island. The extremity of the cape is a rocky knob, 65 feet high, cut by deep crevices, to the northward of which are two timbered knobs. From offshore, the knobs appear as islets, the tops of the wooded knobs showing flat. The cape rises to a rocky steep ridge, with jagged, serrated sky line. This ridge and the knobs at the extremity of the cape serve as good landmarks.

Two rocky islets, with sunken rocks between, bear 295° from the cape. The outermost is about 0.2 mile offshore. Heavy tide rips form immediately to the westward of these islets.

Shaft Rock, 1.1 miles northward of the cape, is conical in shape, of a light-brown color, and shows prominently from the southward and northward. Between the cape and Shaft Rock, ledges extend offshore for about 0.3 mile. The cape should be given a berth of at least 0.8 mile when rounding.

Four miles northward of the cape, on the west coast of Noyes Island, is a small bay where small boats find anchorage in 5 to 8 fathoms, in calm weather, near the head of the bay.

Roller Bay, 7 miles northeastward of Cape Addington, is open and exposed and is not recommended as an anchorage. At the head of the bay a tongue of land extends offshore, and appears as a wooded island. A small rocky islet is close to the south shore of this tongue, and two sunken rocks are about 0.3 mile to the southwestward. The inner part of the bay is shoal. Depths of 6 to 15 fathoms are in the outer part of the bay.

The head of the bay is the western end of a divide which extends across the island. From westerly directions, it is a conspicuous means of identifying the locality. The headland at the north extrance point of the bay rises to a prominent flat-topped mountain. At the westerly slope of the peak near the shore, pinnacle rocks over 100 feet in elevation, are formed by deep clefts.

St. Nicholas Channel, connecting the Gulf of Esquibel with the Pacific Ocean, is 8 miles long in a northeasterly direction, 0.5 mile wide at the southern end, and 2.5 miles wide at the northern end. Noyes Island forms its western and Cone and Lulu Islands its eastern shores.

Prominent features.—The grassy hill at the southwestern part of Lulu Island is prominent from northerly directions, appearing rather sharp, grass- and brush-covered, with a steep slope to the northeast and a gradual slope to the southwest. The hills to the westward appear as rounding hills. The peaks at St. Nicholas Point and the peaks on Cone Island are prominent.

Tides and currents.—The current floods northward and ebbs southward. During large tides strong tidal currents are experienced. Heavy tide rips sometimes occur near the entrance, extending from St. Nicholas Point to Cone Island, which when viewed from northward, appear as breakers.

St. Nicholas Point, at the southern entrance of St. Nicholas Channel on the Noyes Island shore, is high, rising sharply. **Point Santa Theresa,** on the same shore about 1 mile from St. Nicholas Point, presents no prominent features. **Point St. Isidor,** at the western extremity of Lulu Island, is low, with a gradual rise to **Isidor Hill,** rounded and high. Foul ground extends 0.2 mile offshore from the point and from the shore northward of it. **Twin Rocks,** 1.5 miles from Point St. Isidor, slightly to eastward of midchannel, show two rounded knobs, each about 6 yards in diameter. A small timbered island is about 0.8 mile eastward of Twin Rocks. A 1-fathom spot is 300 yards off the north end of the island.

Kelly Cove, on the west side of St. Nicholas Channel, 0.6 mile from Point Santa Theresa, affords anchorage for small craft in 6 to 9 fathoms, rocky bottom. A fish-buying scow is moored here during the season from May 1 to September 15. All necessary supplies for fishermen including fresh water are available. There is 150 feet of mooring float with suitable depths alongside. Radio schedule is maintained with Alaska Communication System.

San Francisco Island, three high-water islands 3 miles from the northern entrance and about 0.4 mile from the Lulu Island shore, is 108 feet high. The southern side is a sheer rock bluff, inconspicuous on account of its dark color.

The bight 0.7 mile southward of San Francisco Island affords anchorage for small craft in about 10 fathoms, sand and gravel bottom. The gravel beach at the head of the bight makes well offshore. Anchorage for small vessels may be had in 8 to 18 fathoms, sand and gravel bottom, in the bight 0.7 mile eastward of San Francisco Island; here the gravel beach at the head of the bight makes well offshore.

Point San Francisco, on the west side of the channel 2 miles from the north entrance, is a low sandy point, with sand and grass near the high-water line. It shows prominently and may be distinguished by its light color. A rock which bares 9 feet is 1 mile 221° from Point San Francisco. A ledge with ¾ fathom over it, and marked by kelp, is approximately halfway between the rock and the western shore. There is deep water between the rock and the ledge and between the ledge and the shore.

Marabilla Island, 0.8 mile from the north entrance, about 180 yards off Lulu Island, is wooded. Rocks and reefs extend off the southern end for 0.4 mile and for a distance of 0.1 mile off the western and northern shores.

Chart 8157.—Arriaga Passage, the channel northward of Noyes Island and separating it from the Maurelle Islands, is 4 miles long in an easterly direction and from 1 to 1.8 miles wide.

Tides and currents.—In general, the current floods eastward and ebbs westward. Only at the west entrance has the tidal current any noticeable effect. Drifting kelp is frequently found in midchannel abeam the entrance to Sonora Passage.

Cape Ulitka Light (55°33.8′ N., 133°43.6′ W.), 115 feet above the water and shown from a small white house on the north end of the cape, marks the south side of the western entrance to Arriaga Passage. The cape, locally known as **Snail Point,** is a neck of land which projects about 0.6 mile in a northerly direction from the northwestern end of Noyes Island. A long rounded ridge and a pinnacle rock at the extremity of the cape, give it an appearance, from easterly and westerly, which accounts for its local name.

Ulitka Bay, eastward of Cape Ulitka, affords fair-weather anchorage for fishing boats in depths of 6 to 8 fathoms. The head of the cove should not be approached too closely as the shores are foul.

The point 2.2 miles eastward of Cape Ulitka shows well at night from the western entrance. Rocks extend off this point for about 0.2 mile. An 11-fathom bank, usually marked by kelp, is 0.6 mile 343° from the point. The shoreline between this point and Cape Ulitka should be given a berth of at least 0.4 mile.

Chart 8158.—Steamboat Bay, about 3 miles eastward of Cape Ulitka, is 0.8 mile wide at the entrance, and 0.2 mile wide at the head. **Steamboat Point,** rounding and indefinite, is the western entrance point of the bay.

Point Incarnation, 3.6 miles eastward of Cape Ulitka, is the eastern entrance point. A light marks the point, which is the northern extremity of a low wooded islet. Rocks and kelp are off the point, close-to. From the point 8- and 9-fathom spots extend in a northerly direction for 0.8 mile. A 6-fathom spot, marked by kelp, is just within the entrance, slightly westward of midchannel, and about 0.5 mile southwestward of the light on Point Incarnation.

A cannery with a 285-foot wharf is on the western shore of Steamboat Bay near the head. The face of the wharf is 136 feet long and has a depth of 18 feet alongside. The Union Oil Company wharf, northward of the cannery wharf, has a depth of about 13 feet at its face. In making a port landing at the wharf, care must be taken to avoid the sand and gravel beach which extends at low water several hundred yards from the head of the bay. Large vessels make a starboard landing. The cannery operates a general store during canning season and a radio station the year round. Fresh water, diesel oil, gasoline, and lubricating oil can be obtained at the wharf. There is a small machine shop.

Good anchorage in 18 fathoms may be had about 250 yards off the wharf. The bottom is sand with a rather hard crust, through which a heavy anchor sinks into softer and better holding ground. During heavy southeasterly weather the wind draws through with considerable force. Small boats anchor close to the head of the bay. The bay is open to the northward and during northerly blows probably affords but little protection. It is reported that the ocean swells enter the bay. At night deep shadows are cast by the mountains and the en-

trance cannot always be readily distinguished. During the fishing season the lights at the cannery can usually be seen when abeam the entrance.

Chart 8157.—St. Joseph Island, at the northwest end of Arriaga Passage, has a number of high timbered knobs. The west coast is rocky and foul, and the northwesterly portion should be given a berth of at least 1 mile. Rocks and irregular bottom extend off the northerly coast for about 0.4 mile. The east and southerly coasts are, in general, rocky shelves which drop off rapidly. A 10-fathom spot is 0.4 mile 220° from the south point of the island.

San Lorenzo Islands, at the northeastern end of Arriaga Passage, consist of two timbered islands separated by a narrow channel. This channel is locally known as **Hole in the Wall** and two or three fish-buying scows anchor in the wider part of it each summer from May 1 to September 15. All necessary supplies for fishermen are available here. There are long mooring floats for fishing craft at the different scows. Fresh water is available.

A midchannel course through the very narrow southeastern entrance is safe, but inside, the northeastern side of the channel should be favored when passing the vertical bluff on that side. A submerged rock, which covers 4 feet, is about 150 feet off the southern shore, opposite the vertical bluff. A depth of 3 fathoms can be carried past the rock on its northeastern side.

Sonora Passage, between St. Joseph Island and the San Lorenzo Islands, connects Iphigenia Bay with Arriaga Passage. It is about 2 miles in width, but has very irregular bottom. Foul ground extends almost 0.5 mile off the islands northwestward of the San Lorenzo Islands. If used, a midchannel course is to be followed, but the use of Arriaga Passage is considered preferable.

The **Gulf of Esquibel** is 8 miles long from Noyes Island to Tonowek Bay and 6 miles wide from San Fernando Island to the Maurelle Islands. It is clear of islands and connects by several passages with the sea.

The **Hermagos Islands,** on the southeast side of the Gulf of Esquibel, are a group of low wooded islands northward of Garcia Cove about 0.3 miles offshore from San Fernando Island. A small island, with a prominent evergreen on its northern side, is halfway between the group and San Fernando Island. There is a small-boat channel on either side of this island.

Point Garcia and **Point Aguirre** are low, wooded points on the northwestern end of San Fernando Island. Foul ground extends offshore for 0.5 mile in a northwesterly direction.

Garcia Cove is a small cove at the northwest end of San Fernando Island. A small wooded islet is off the western point of the entrance, and there is a group of small islets on the eastern side of the cove at the entrance, to the southward of which is a small rock 9 feet high. Two rocks, that uncover 7 feet near the entrance, are left to the westward in entering. Anchorage in which swinging room is restricted, may be found in 9 fathoms, mud bottom, about 150 yards southward of the 9-foot rock in the center of the bay.

Aguirre Bay is an open bight southward of Point Aguirre. Rocks awash extend part way across the entrance.

Blanquizal, St. Philip, and **Culebra Islands** are three groups of islands and rocks in the eastern part of the Gulf of Esquibel close to the Prince of Wales Island shore, distant 3, 5, and 6 miles, respectively, northwestward of San Christoval Channel. They are comparatively low and heavily wooded. At the south end of St. Philip Island is an old Indian village, known locally as **Bobs Place.** Fair anchorage for moderate sized vessels can be had in midchannel off the village.

A dangerous rock, bare at low water and marked by kelp, is 0.5 mile off St. Philip Island at a point 1.4 miles 311° from the west point of Blanquizal Islands.

Curacao Reef is 0.8 mile westward of the south end of Culebra Islands, with deep water between. The reef has a least depth of ½ fathom, is small in extent, and marked by a buoy off its western extremity.

The **Maurelle Islands** are a group of islands, rocks, reefs, and breakers forming the west side of the Gulf of Esquibel covering an area about 12 miles long in a northerly direction and about 9 miles wide.

Caution.—Navigation among these islands, except in small craft, without local knowledge, is dangerous.

Anguilla Island, one of the largest of the group, is timbered and rises to an elevation of 630 feet. From offshore, the summit may be recognized, appearing rather sharp, its sky line to the westward and southeastward appearing lower and somewhat flat. **Anguilla Bay,** on the south side of the island, is foul at its head.

Esquibel Island, Turtle Island, Sonora Island, Twin Islands (Princess and Favorita Islands) and the unnamed islands are generally wooded, and have no characteristics of marked interest to the navigator. The largest and highest of the **Wood Islands** (group of three) is wooded and rises conical-shaped to a height of 280 feet; it is somewhat prominent from offshore.

Timbered Islet, very prominent from offshore, the westernmost of the Maurelle group, is 198 feet high and wooded. The shores are sheer cliffs and ravines, brown in color. There are several rocks close by, and a breaker is about 100 yards northward from the north shore. A barren, gray-colored island, slightly smaller, is just south of Timbered Islet.

From Timbered Islet to the Wood Islands is a line of breakers which shows in a moderate swell. In heavy weather, breakers may be seen for about 800 yards around the rock which is 0.8 mile 209° from Emerald Islet. The body of water between the two groups or rocks which are about 0.8 mile northwestward and about 0.5 mile westward from the western shore of Little Dome Islet, breaks in heavy weather.

About 550 yards from Feather Rock, in range with Gull Island, is a small area, marked by kelp, which is dangerous in heavy weather.

About 0.5 mile westward of the Wood Island group is

an extensive area of rocks and breakers which are marked by kelp. Near the southern end of this patch is a low, bare, round-topped rock.

Tide rips, heavy for small craft, were observed in the vicinity of Timbered Islet, the north end of St. Joseph Island, and Feather Rock.

Anchorage.—There is an anchorage for small craft in the west side of **Nagasay Cove,** on the north side of Esquibel Island, in 4 fathoms, mud bottom. There is a small house on the shore which serves as headquarters for the caretaker of a concern which has leased Anguilla and Esquibel Islands for fox raising.

Channels.—Sonora Passage affords the only ship channel among the islands. The known dangers are shown on the chart. The channels used by small boats are numerous but have many dangers, mostly indicated by kelp.

Launch Passage, between Anguilla and Esquibel Islands, is frequently used. In making passage from the Gulf of Esquibel, keep southward of the two rocks, awash at half tide, just inside the entrance. When abeam the inner rock, change course to pass close to and just south of the two islands in midchannel. Keep close to the islands. From here the channel is clear to the anchorage in Nagasay Cove, on the north side of Esquibel Island.

Northwestward of the anchorage in Nagasay Cove are numerous islands. The channel between these and the Anguilla Island shore is used. In passing northward, favor the islands, passing westward of two rocks in midchannel, almost awash at one-quarter tide. When past these rocks, the Anguilla Island shore is favored. Near the north end of the channel are shoal spots. There is a rock awash 250 yards westward of the northwestern island. The two islands off the southwestern shore of Anguilla Island should be given a berth of at least 0.2 mile. Deep water was found on all sides of the rock, awash at one-half tide, 0.3 mile 312° from the north end of Turtle Island.

There is a launch channel northward of the San Lorenzo Islands, just southward of **Escurial Island.**

Currents appear to be entirely tidal; the strongest are reported to occur around Timbered Islet and the north end of St. Joseph Island but do not exceed 2 knots. Between Timbered Islet and the Wood Islands and to the southwest, also to the northward of St. Joseph Island, currents run northeasterly in flood and southwesterly in ebb; between Emerald Islet and Feather Rock, the current runs easterly on flood and westerly on ebb. Southwestward of Emerald Islet and Gull Island, flood sets southeastward and ebb northwestward. In the vicinity of Lambda Rock, southward of Twin Islands, the flood runs easterly, the ebb westerly. In the area between this rock and the San Lorenzo channels, little, if any, current was observed. In the small passage eastward of Wood Islands, the flood runs north and the ebb south.

Directions.—The navigation of the Gulf of Esquibel presents no difficulty. The waters are generally deep except near the shores. The known dangers are shown on the chart; the principal one, Curacao Reef, is marked by a buoy. Small craft with local knowledge pass inside all of the islands of the St. Philip and Culebra groups. A rock which bares is 300 yards southeastward of the 130-foot island off the southeast end of St. Philip Island.

Tonowek Bay extends northeastward for about 6 miles from the Gulf of Esquibel to Tonowek Narrows and forms the eastern side of Heceta Island. **Kabanof Rock,** awash at high water, is near midchannel about 0.9 mile southward of the 1,085-foot hill on Heceta Island.

Warm Chuck Inlet, on the northwest side of Tonowek Bay, has considerable foul ground, as indicated on the chart. A rock, with ½ fathom over it and marked by a buoy, is in midchannel, 0.5 mile eastward of a well-defined point on the southwest shore. About 0.7 mile northward of this point is a group of wooded islets. Rocks that uncover 7 feet are 150 yards southward of the group.

Salt Lake Bay, on the southeast side of Tonowek Bay, is about 2 miles northeastward of the Culebra Island Group. The entrance is choked by a group of wooded islands. Two channels are used, one northward of the group with a depth of 1½ fathoms, the other southward of the group with a depth of 2½ fathoms. The northern and southern ends of the bay are shoal; depths of 7 to 11 fathoms are found in the center. A number of freshwater streams, emptying into the bay, attract salmon in considerable numbers.

Harmony Islands, on the eastern side of Tonowek Bay, are a group of high, wooded islands. There are channels between the islands of this group, but they are made difficult by numerous dangers. Rocks which cover are off the southern and western points of the group.

The channel eastward of the Harmony Islands and eastward of the islands southward off the entrance to Salt Lake Bay is used extensively by small craft plying between San Christoval Channel and Tonowek Narrows. The midchannel is safe and partially protected. It is a continuation of the small-craft channel eastward of Blanquizal, St. Philip, and Culebra Islands.

Nossuk Bay, in the southeastern part of Tonowek Bay, 1 mile southward of Tonowek Narrows, is largely filled with islands and shoals. **Nossuk Anchorage,** in the northern part of the bay, 0.5 mile southward of Tonowek Narrows, affords excellent anchorage in 10 fathoms, soft bottom. The northern entrance is narrow and the least depths are shown on the chart.

Bocas de Finas is the passage leading from the junction of the Gulf of Esquibel with Tonowek Bay to Iphigenia Bay and the Pacific Ocean. It is between Anguilla, Tonina, Bushtop, and Twocrack Islands, which are the northeasternmost of the Maurelle group, and the southwest coast of Heceta Island.

Current.—Between Emerald Islet and Dead Tree Point, the estimated velocity of the current is about 2 knots.

The Heceta Island shore, on the northeastern side of the passage, is steep with no outlying dangers. The southwestern side of the passage is foul for about 0.3 mile off the Anguilla Island shore, and should be avoided. The least width about 0.7 mile between Twocrack and Heceta Islands is at the northwestern end of the passage.

Heceta Island shows up prominently from the west-

ward. The southern end is rocky, rugged, and mountainous, and the western shore is formed by light-colored cliffs; the northern part of the island is lower and more heavily timbered. **Bald Mountain** has several bare summits and is a prominent landmark near the southern end of the island. **Timber Knob,** centrally located on the southern part of the island, and lower than Bald Mountain, is timbered, and has moderate slopes; from a considerable distance offshore to the westward, it may be recognized over the coast ridges. **Cone Peak** shows from the westward over long, wooded ridges, as a low wooded cone. The 1,050-foot peak to the northward shows prominently from offshore.

Point Desconocida, the southern point of Heceta Island, marks the north side of the eastern entrance to Bocas de Finas. **Desconocida Reef,** an area of broken ground, boulders, and sunken rocks, extends 700 yards southeastward of the point. A rock, barely covered at low water, at the outer end of the reef, is marked by a buoy on its southeastern side.

There is a secure anchorage in the western bight on the north side of Anguilla Island, about 0.5 mile southward of Bushtop Islet. When entering, pass about 200 yards eastward of Bushtop Islet and stand in on a southerly course. Anchor in 12 to 15 fathoms, soft bottom. There is kelp and broken ground on the western side of the anchorage.

Tonina Island is about 300 yards northward of the western end of Anguilla Island, with islets and rocks between. **Twocrack Island,** on the south side of Bocas de Finas, is wooded, and has two prominent crevices which can be seen only from the northward and southward. The island shows up dark against Heceta Island.

Bushtop Islet, about 0.8 mile southeastward of Twocrack Island, is 45 feet high and conspicuous from Bocas de Finas; 100 yards eastward of it is a small bare rock.

Dome Islets are two small wooded islands close together, about 0.5 mile 227° from the southerly end of Twocrack Island. **Feather Rock,** 5 feet high, is 2.4 miles 260° from Twocrack Island.

From Bocas de Finas to Cape Lynch the coast is rugged, with numerous outlying islets and reefs, most of which show above water. The main passage follows the general trend of the shoreline at a distance of between 0.2 and 0.5 mile. The southwestern side of the passage is fringed by an area of broken ground, reefs, and islets extending about 4 miles northwestward from Emerald Islet to Losa Island. This section of the passage is exposed to the swell from seaward and during and after gales, vessels traversing it are subjected to a disagreeable beam sea, which breaks furiously over the rocks on both sides of the passage. Two much reliance should not be placed on the position of the buoys, especially after severe storms.

White Cliff, on the Heceta Island shore, is a precipitous wooded point with white cliffs 100 feet high. About 0.8 mile southeastward of White Cliff is a conspicuous landslide extending down to the water from near the summit of the ridge. A lighted bell buoy, 0.6 mile westward of White Cliff, marks the outer limit of dangers on the east side of the passage.

Emerald Islet, 45 feet high, flat, with several clumps of stunted spruce, shows up green. There is a very small sand beach on the southeast side. The ground in the vicinity of this island is foul. A buoy, 0.5 mile northward of Emerald Islet, marks the outer limit of dangers on the southwest side of the passage.

Dead Tree Point juts out from the higher land of Heceta Island and is low and wooded, with bare cliffs at the water. **Raso Rock,** a large bare rock 20 feet high, is 0.6 mile west-southwestward of Dead Tree Point. A rock, 6 feet high, is about 0.7 mile northwestward of Raso Rock.

Gull Island, 87 feet high, is light-colored, grass-covered at the top, somewhat flat, and has rather steep shores. Rocky islets and foul ground extend in a northerly direction for about 1.5 miles. To the eastward for about 0.4 mile, the ground is foul.

Losa Island, about 2 miles westward of Cape Lynch and 1.5 miles north-northwestward of Gull Island, is only 5 feet high, and is the westernmost of the chain of islands and reefs lying southward and southwestward of Heceta Island. Foul ground extends for 0.2 mile northwestward of the island.

Cape Lynch Light (55°46.9′ N., 133°42.0′ W.), 50 feet above the water and shown from a small white house on an islet off the south end of Cape Lynch, marks the western end of Heceta Island. The light also marks the western approach to Boca de Finas, the approach to Davidson Inlet, and the eastern side of the entrance to Sumner Strait.

A kelp-marked ledge, with 1½ to 4 fathoms over it and a 2¾-fathom spot at its outer end, extends 0.6 mile northwestward of the cape.

Cone Bay, northeastward of Cape Lynch, is open and exposed to the westward. The bottom is irregular and kelp extends well into the bay along the southern shore.

Tonowek Narrows, locally known as **Little Skookum Chuck,** connects Tonowek Bay and Karheen Passage. It has a least width of 230 yards between the 3-fathom curves.

Currents.—The currents in Tonowek Narrows set northeastward on the flood and southwestward on the ebb. The velocity of the current is 3.0 knots. For daily predictions, see the Tidal Current Tables. Tide rips have been reported, but they are seldom dangerous even to small boats.

Karheen Passage extends from Tonowek Narrows to Sea Otter Sound. The southeastern part of the passage is characterized by islets, ledges, and generally broken ground, surrounded by comparatively deep water. Much of the area is filled with kelp. The channel is marked by buoys as far as Karheen Cove and is used by vessels of about 17-foot draft.

Currents.—Currents in Karheen Passage set northwestward on the flood and southeastward on the ebb. The velocity of the current is weak, being less than 1 knot.

Point Swift is on the east side at the north end of Tonewek Narrows. **Point Swift Rock,** bare at half tide, is 0.3

mile northeastward of Point Swift. A buoy is about 0.3 mile north-northeastward of the rock and marks the north end of the shoal area extending from the rock. A daybeacon is on a small islet 16 feet high, on the western side of the channel, 0.6 mile northward from Point Swift.

Ham Islands, a group of wooded islets, are 1.5 miles northeastward of Tonowek Narrows, and extend about 1 mile in a southerly direction from the northeast end of Heceta Island. Reefs and broken ground extend easterly, southerly, and southwesterly of the islands. A buoy about 1.1 miles northeastward of Point Swift marks a sunken rock about 0.3 mile southward of the southernmost of the three larger central islands of the group. Another buoy is on the western side of a sunken rock marked by kelp, about 1 mile northwestward of Kauda Point, the southern extremity of Tuxekan Island.

Trim Islet is about 0.5 mile northeastward of Ham Islands, close to the Tuxekan Island shore. **Cob Islet** is about 0.3 mile northwestward of Trim Islet and 1 mile southward of Karheen Cove. Reefs extend 150 yards southward and westward from Cob Islet. A buoy marks the edge of the reef on the western side of the islet.

Chapin Island, small and wooded, is on the western side of Karheen Passage westward of Cob Islet. An unlighted range of two daybeacons on the northern end of the island, in line **308°**, marks the center of the channel lying north of Ham Islands and south of Trim and Cob Islets. Local fishing craft prefer the shortcut known as **Canoe Pass,** extending southwesterly from Chapin Island between Heceta and Ham Islands. Strangers and larger vessels should use the longer route through Karheen Passage.

For 1.5 miles northwestward from Cob Islet, Karheen Passage has an average width of 0.5 mile. The depths are generally good except for an extensive kelp-marked ledge, with a least depth of 1½ fathoms over it, in midchannel westward of Karheen Cove. During summer months streamers of kelp are visible along the western half of the passage, just north of Chapin Island, in 3 to 5 fathoms.

Karheen Cove is a small indentation on the west side of Karheen Passage at its northwestern end. A bare rock is off the southern point at the entrance. A buoy marks the outer end of the ledge which extends about 400 yards southwestward from the southern point.

Karheen is an abandoned native village on the northerly side of Karheen Cove. Only a few ruins now mark the site of the former cannery.

Peep Rock, a conspicuous rock, marked by a light, is about 0.7 mile northwestward of Karheen Cove. Shoal areas, marked by kelp, extend for about 700 yards westward of the rock. The channel eastward and northward of the rock is clear and is generally used in preference to the channel southward, where there are unmarked dangers.

Chart 8157, 8171.—Tuxekan Passage has its southern entrance on the southeastern side of Karheen Passage, and extends northward along the east side of **Tuxekan Island** for about 10 miles to El Capitan Passage. The shores are heavily wooded throughout its length, and are indented with numerous bights, coves, and bays, which provide anchorage in any desired depth. The width varies from a maximum of about 2 miles north of Staney Island to about 225 yards in the narrows. This passage is preferred to Karheen Passage by some operators en route between Tonowek Bay and El Capitan Passage.

Currents.—The currents in Tuxekan Passage set generally northward on the flood and southward on the ebb. The velocity of the current is weak, being less than 1 knot.

Chart 8157.—Kaguk Cove, at the southern end of Tuxekan Passage, affords a well-protected anchorage in depths from 3 to 10 fathoms, with a gentle sloping bottom.

The **Dasani Islands,** in the southern entrance to Tuxekan Passage, are wooded, with boulder-strewn beaches. An extensive kelp patch extends northeastward from the northern island. Other kelp patches, over rocks awash, are eastward of these islands.

Kauda Point, at the southern tip of Tuxekan Island, is a small islet at high water and is conspicuous from the southwest and northeast. **Gaohi Islands,** across the passage from Kauda Point, forms the southwest shore of Winter Harbor, where good small-boat anchorage is available in depths of 2 to 10 fathoms. They are difficult to identify when approaching from the westward.

Nundei and **Yahku Coves** are not recommended for small-boat anchorages. Nundei Cove is deep and exposed to the north. A rock which covers at high water constricts the entrance to Yahku Cove.

Chart 8171.—Staney Island is about midway between Tuxekan and Prince of Wales Islands. It is the largest and most northwesterly of a chain of wooded islands extending into the passage from the eastern shore. The passage to the west and southwest of Staney Island is clear, but from other directions it should be approached with caution. A 1¾-fathom rock is 0.8 mile north of the island. Northeastward from Staney Island the waters are generally foul with a number of rocks which uncover from 1 to 7 feet.

Naukati Bay is the largest indentation in the eastern shore of Tuxekan Passage. Its entrance, about 2 miles north of Staney Island, is constricted by rocks and kelp and the entire area has numerous islets, reefs, and rocks. By following a narrow winding channel 3 fathoms can be carried well-in toward the head of the bay.

Klinau Island, on the west side of the entrance to Naukati Bay should be given a wide berth. A rock that uncovers 4 feet is about 0.3 mile southwest of the island and the waters around it from east through south to west are foul.

Nichin Cove on the west side of the passage affords good small-craft anchorage. Large vessels will find good anchorage in 6 to 8 fathoms, mud bottom, off the entrance to the cove.

Little Naukati Bay is not recommended as a small-boat anchorage. At low water its entrance is almost closed by rocks and reefs. The best water into it is the northern

channel. Tuxekan Narrows, northward of Little Naukati Bay, is relatively clear and deep.

Village Rock, about 0.5 mile northwest of the narrows, is awash at high water and is marked by a daybeacon. Vessels using the waterway pass about 100 yards eastward of the rock and head in a northwesterly direction to avoid the shoal water that extends about 0.2 mile off Kinani Point.

Jinhi Bay extends southwestward from Village Rock. This bay shoals gradually to mud flats which bare in its western extremities. It is studded with small islets and numerous rocks that bare at various stages of tide. Only those with local knowledge should attempt to enter this bay.

Elghi Island, near the northern extremity of Jinhi Bay, is one of the more prominent features of Tuxekan Passage. The waters to the west are foul, and a large rock that uncovers 4 feet is about 0.1 mile east of its northern tip. A small rock awash is 100 yards north of the large rock.

Aikens Rock, marked by a daybeacon, is about 300 yards east of the northern end of Elghi Island. **Kassan Islands** separate Tuxekan Passage from El Capitan Passage. These islands are heavily wooded and separated only by a narrow channel that runs dry at half tide.

Kahli Cove, between Kassan Islands and Prince of Wales Island, provides suitable anchorage for small craft. The southwestern entrance is constricted by rocks and reefs, but a narrow winding channel is open. The northeastern entrance is less winding and has fewer rocks.

Davidson Inlet is the western part of a large expanse of water, northeastward of Iphigenia Bay, between Heceta Island and Kosciusko Island. The eastern part, Sea Otter Sound, is separated from it by a chain of islands which extend southwestward from Marble and Orr Islands. The shores and islands in the inlet and sound are wooded and generally high. The entrance to El Capitan Passage, which leads eastward and northward of Kosciusko Island into Sumner Strait, is at the northeastern end of Sea Otter Sound.

The entrance to Davidson Inlet is 2 miles wide between Whale Head and Surf Point, the northwestern extremity of Heceta Island. **Surf Point Light (55°49.9′ N., 133°37.8′ W.)**, 29 feet above the water and shown from a small white house on the point, marks the southeastern side of the entrance. **Surf Point** is low and wooded. From it broken ground extends about 0.7 mile northward, with a 1¼-fathom shoal 0.4 mile northeastward of the light. During severe weather the seas are reported to pile up heavily and it is advisable to give the point a berth of at least 1 mile.

Whale Head, a prominent cliff 50 to 300 feet high, which shows up conspicuously offshore to the southwestward, marks the northwestern side of the entrance. It is the southern extremity of **Whale Head Island.**

Broken ground extends 0.6 mile southward of Whale Head, with a 1½-fathom shoal, which breaks, about 0.5 mile, and a 3¾-fathom patch, marked by kelp, about 0.6 mile southward of the head. **Whale Rock,** bare at half-tide, is 0.5 mile south-southwestward of the head. A midchannel course through the entrance clears all dangers.

Northward of Whale Head Island, a chain of islands extends to the southern end of Kosciusko Island. The passes between these islands are suitable for small craft only.

Fake Pass, the southerly of the two larger channels, has a minimum depth of 4 fathoms. A rock awash is in the center of the southwest entrance. The seas pile up heavily on this rock and in the pass during moderate to severe southwesterly weather. **Cosmos Pass,** the northerly channel, has a controlling depth of 3½ fathoms and current of not more than 3 knots, and is used by small boats bound to and from Warren Channel. Breakers cover the western entrance to Cosmos Pass in heavy southwest weather. A buoy marks a rock near midchannel.

Port Alice, on the south side of the sound eastward of Surf Point, is a secure anchorage. Near the middle of the port, 0.5 mile inside the entrance, is a low, bare rock from which a ledge extends 250 yards northward and westward; a bare ledge is 0.2 mile southward of this rock. A fish-buying scow anchored at the head of the port operates from May 1 to September 15. Fishermen supplies including provisions, gasoline, fuel oil, lubricating oil, and some fishing gear are available. There are 150 feet of mooring float and fresh water can be obtained at the float. A radio schedule is maintained with the Alaska Communication System.

To enter, give the points at the entrance a berth of about 0.5 mile and enter in midchannel. Follow the western side at a distance of 250 yards, passing westward of the bare rock until about 0.5 mile from the head of the port, where good anchorage will be found in the middle in 14 to 18 fathoms, soft bottom. Fresh water can be obtained by boats from several small streams.

Green Island, 4 miles northeastward of Whale Head, is about 0.5 mile in diameter. A 2-fathom spot is 0.4 mile southward of the small island southeastward of Green Island. A large kelp patch surrounds it and a 3½-fathom patch about 300 yards southwestward.

A rock with 1 fathom over it is about 1.4 miles westward of **White Cliff Island.** A 3½-fathom shoal, marked by kelp, is 1.9 miles 292° from the northwestern extremity of the island. There are numerous other unmarked isolated dangers and shoals in Davidson Inlet and Sea Otter Sound. They are shown on the chart and with close attention little difficulty should be had in avoiding them.

Chart 8163.—Edna Bay is on the western side of Davidson Inlet, 5.5 miles northward of Whale Head. It has good anchorage about 0.3 mile from the southern shore in 14 to 17 fathoms, soft bottom. Islets and foul ground make out 0.5 mile from the western end of the bay; foul ground makes off in the northern part of the bay, 750 yards from the western shore and 500 yards southward from an islet.

Limestone Point, the northern entrance point to the

bay, is marked by **Edna Bay Entrance Light (55°56.4′ N., 133°36.9′ W.)**, 20 feet above the water and shown from a small white house on the end of the point.

Entrance Island forms the southwestern side of the entrance to the bay. A narrow channel, westward of the island, has a controlling depth of 4 fathoms, but should be used only by those with local knowledge. Kelp-marked reefs extend 300 yards southward of the island. A 7½-fathom shoal extends 0.2 mile northward of the island and nearly halfway across the entrance. At about midchannel 18 fathoms are found. Near the center of the bay are two unmarked shoals with depths of 6 and 8 fathoms. The chart is adequate for the entrance east of the island.

A 9-foot rock, marked by a buoy, is at the southeastern end of the extensive shoal area marking out from the western side of the bay. About 0.2 mile southeastward of this shoal is an unmarked 8-foot shoal.

A light, 20 feet above the water and shown from a small white house on the western escarpment of the bay, is the guide for a channel between these shoals, leading northwestward to a logging company floating wharf.

Edna Bay (pop. 135; P.O.), an unincorporated settlement, is on the west side of the bay about 900 yards northward of the light. A 9-foot shoal is near midchannel 250 yards north of the light. A depth of 20 feet can be carried to the vicinity of the wharf. Strangers should not attempt this channel without obtaining local information.

In the bight northward of the floating wharf is a log pond and rafting area, and a logging skyline with an overhead clearance of 50 feet.

Small boats will find excellent shelter in the extreme southwestern part of the bay from winds from the southeast through south to west, in depths of 3 to 12 fathoms, with good holding ground, sticky mud.

Chart 8171.—Van Sant Cove is a small open bight on the western side of Davidson Inlet, about 4 miles northeastward of Edna Bay. A reef is off the southern point of the entrance.

Old Tokeen is the site of an abandoned marble quarry on the northeastern shore of a cove in the northwestern end of Marble Island. Anchorage can be had westward of the ruins of the wharf in 14 to 17 fathoms. Small craft can find anchorage in 4 to 8 fathoms, soft bottom. The cove is shoal southward of the wharf site. A rock, which bares 9 feet is 300 yards westward from the northeast point of the cove.

Tokeen Bay, on the eastern side of Davidson Inlet, about 11.5 miles northeastward of Whale Head, extends northeastward for about 3.5 miles. Its eastern side is connected with El Capitan Passage by a high-water boat passage. A shoal with 2¾ fathoms over it is in the middle of the bay, about 2.4 miles eastward of the north point at the entrance. Elsewhere in the bay a midchannel course is clear, but there are rocks in places near the shores and care is required in its navigation.

Anchorage can be found in the middle of Tokeen Bay, about 0.5 mile eastward from the north point at the entrance in 14 to 16 fathoms; also at the northern end, northeast side, and southeast end of the bay. There are several sheltered anchorages for small craft, one of which is at the head of the bay behind the small islet in 4 fathoms, mud bottom. The area east of the small wooded islands in the southeastern part of the bay also offers good anchorage in 4 to 10 fathoms, mud bottom.

Marble Passage extends northward from the northeast part of Davidson Inlet between **Marble** and **Orr Islands.** The approaches to the channel at each end are obstruced by rocks and ledges and about midway between the ends the channel shoals to depths of about 2 feet. The tides meet in the northern part of this passage.

Sea Otter Sound extends westward from Karheen Passage and Tuxekan Island along the north side of Heceta Island to Davidson Inlet. Its west shore is formed by numerous islands, large and small. The sound is about 6 miles in extent, with depths of 17 to 75 fathoms, irregular bottom. There are few desirable anchorages in the sound. With the assistance of the chart, depths suitable for anchorage can be found on its eastern side, but care is required on account of sunken rocks, which are generally marked by kelp during summer.

Turn Point, low and wooded, is on the eastern shore of the sound, and forms the northern point at the western entrance to Karheen Passage. There is considerable foul ground in the cove eastward of Turn Point.

About 1.5 miles southward of Turn Point are a group of wooded islands which form the southern shore of the western entrance of Karheen Passage. Shoals, marked by kelp, extend for about 0.5 mile northward of the western islands of this group. Good anchorage for small vessels can be found back of the islets and shoals about 1.2 miles west-southwestward of the light on Peep Rock. By running on a northwesterly course, keeping Clump Island on range with the gap between the two largest islands in this group, the mariner will find suitable depth in less than 20 fathoms.

The cove on the northern end of Heceta Island, just west of Camp Island, and about 5 miles southwestward of Turn Point, is shoal in its eastern part. Protected anchorage for small craft can be found in the westernmost of two bights at the head of the cove, with restricted swinging room.

Gas Rock is a bare islet about 0.6 mile from Heceta Island and 4 miles eastward of Whale Head. **Clump Island,** 3 miles east-northeastward of Gas Rock, is the outer one of a group 1.2 miles southward of Eagle Island, with foul ground between.

White Cliff Island is about 0.9 mile northward of **Eagle Island.** It is wooded and has a prominent white cliff on the southwest side. **Fox Rock** is about 0.4 mile westward of the Eagle Island group. **Dove Island, Owl Island, Hoot Island,** and **Cap Island** are some of the small wooded islands in the northern part of Sea Otter Sound.

Cyrus Cove is a small bight in the northern part of the sound, and is an excellent anchorage for small boats. The best anchorage, in depths of 5 to 10 fathoms, good holding ground, mud bottom, is in the center of the

northern part where the cove branches to eastward. Five fathoms can be carried through midchannel to this anchorage. Smaller vessels may anchor in shoaler water in midchannel in the east arm of the cove.

The channel northward of Hoot, Owl, and White Cliff Islands and between those islands and Orr Islands is known as **White Cliff Passage.** The passage is marked by 2 lights. A rock, with 8 feet over it, is in midchannel about 0.3 mile southwestward of the western light. A 1¾-fathom spot is just south of midchannel, about 0.4 mile eastward of the eastern light.

Charts 8171, 8172.—El Capitan Passage has its entrance on the northeastern side of Sea Otter Sound. It extends about 18 miles in a northerly direction from Sea Otter Sound to Aneskett Point, then trends westward for about 6.5 miles to Shakan Strait. The southern part of the passage varies from 2 to 4 miles in width, forming a bay 6 miles long in which are numerous rocks and islets. To the northward of this section the passage varies from 0.5 to 1 mile in width and is comparatively clear to Aneskett Point. The shoreline should not be approached too closely, as numerous rocks, awash at various stages of the tide, are close-to. From a point about 3.5 miles west of Aneskett Point to Shakan Strait a 12-foot channel has been dredged through the shoals to provide a protected route for fishing vessels and log rafts.

Numerous bights and inlets indent the shores of the passage, and small boats can usually find anchorage. The entire passage is protected, and larger craft can anchor wherever the depths are suitable; for this information the chart is the best guide. The islands in the passage are heavily wooded without any marked characteristics of interest to the navigator.

Tides and currents.—The mean range of tide in El Capitan Passage is 8.7 feet and the diurnal range is 10.8 feet. In the southern part of El Capitan Passage, the current floods north from Sea Otter Sound. In the channel between El Capitan Island and Tuxekan Island, the velocity of the current may reach 3 knots. In the channel northward of Tenass Island the current is reported to be negligible. In Dry Pass, the current floods eastward with a velocity of 1.8 knots and ebbs westward with a velocity of 0.9 knot. For daily predictions, see the Tidal Current Tables. High and low water in this vicinity occur at practically the same time as at Sitka.

Directions.—Local knowledge is desirable for safe navigation through El Capitan Passage. This applies in particular to the section between Aneskett Point and Shakan Strait. To the northward of Tenass Island midchannel courses hold good, but from Sea Otter Sound to Tenass Island various courses among the islands may be followed. The charts are the guide to safe navigation.

Chart 8171.—Cap Island is at the southern entrance to the passage. **Knob Island,** about 0.5 mile northward of Cap Island, is a small wooded island with two knobs. The channel between it and El Capitan Island is about 100 yards wide, and has depths of 2 to 3 fathoms. Rocks awash are offshore on either side of this channel. Rocks extend off the shore of the island for about 100 yards. **Dot Island** is the larger of two islands about 0.5 mile northward of the north point of Cap Island.

El Capitan Island is near the southern end of the passage. A narrow inlet is in the southern side of the island in which are rocks and depths less than 1 fathom. Off the southeast end of the island, separated from it by a narow, high-water channel, is a small wooded island. A group of rocks off the eastern side of the island is marked by a buoy. On the west side of El Capitan Island is a deep bight with three islands in the entrance.

Tokeen Harbor Entrance Light (55°56.2′ N., 133°-19.7′ W.), 25 feet above the water, is shown from a small white house on a concrete base on the south end of the southwesternmost island.

Tokeen is a settlement with a store, at the head of the bight. The bight is entered from the south through a clear channel. Located here are an ice and cold storage plant, with a wharf having a 100-foot face, with controlling depth of 4 fathoms; a floating shrimp cannery and a mooring float 180 feet in length are available for small craft. Supplies for fishermen, including gasoline and provisions, are obtainable. Fresh water is available at the wharf and float. Radio communication is maintained with the Alaska Communication System. Airplane passenger service is available, upon request, during the summer.

Twin Islands are a group of small islands about 12 feet high about 0.5 mile westward of the southern end of El Capitan Island. Several rocks are on a reef 0.5 mile 043° from Twin Islands.

Fir Rock is a rock awash at higher high water 0.3 mile west-northwestward of Twin Islands. Rocks awash, are close-to.

Keski Island is a wooded island in the southern part of the bight on the western side of El Capitan Island. Foul ground extends 250 yards westward from the south end of the island, and irregular bottom extends 0.2 mile westward off the northwest part of the island.

Flat Island is a small island on the southern end of the large shoal area eastward of and close to Teal Island. To the northward of Flat Island is another small island. Sunken rocks extend in a northerly direction from Flat Island for 250 yards to a rock awash at high water.

White Point is the northwestern point of a bight on the western side of El Capitan Island abeam Singa Island. Foul ground extends for about 100 yards southward of White Point. **Teal Island** is the southern of three islands westward of El Capitan Island. Rocks extend off the south shore for 0.2 mile.

San Island, is the largest and middle of the group westward of El Capitan Island. Between San and Teal Islands are several islets and foul ground.

Singa Island is the northern of the three large islands westward of El Capitan Island. Between Singa and San Islands are several islets with channels between, navigable by small boats.

Scow Island is a small island northward of Singa Island and about 0.3 mile northwestward of the northern end of El Capitan Island.

Hub Rock, 8 feet high, almost in midchannel, east-

ward of El Capitan Island, is a prominent landmark. Foul ground and irregular bottom extend for almost 0.2 mile from north through west to south from the rock.

Graveyard Island is a small island with a few Indian graves on it at the entrance to Sarkar Cove.

Brockman Island, about 0.8 mile to the northwestward of Graveyard Island, is the largest and most southerly of a group of three islands.

Burnt Island is the small island about 250 yards northward of Brockman Island. The island is covered with a heavy growth of underbrush and a few young second-growth trees. **Burnt Island Light (55°58.5′ N., 133°17.6′ W.),** 15 feet above the water, is shown from a small white house on the island.

Tenass Island is southeastward of the eastern entrance to Tenass Pass. A 4-fathom rock is 0.6 mile northeastward of the north end of the island.

Sarkar Cove, on the east side of El Capitan Passage, about 6 miles from Sea Otter Sound and about 19 miles from Shakan, affords good anchorage in 6 to 8 fathoms, mud bottom. A large lake empties into the head of the cove through a series of rapids. The lower end of the lake is brackish and fresh water is at the head. The lake is an important spawning ground for red salmon.

In entering Sarkar Cove favor the northern shore to avoid a rock, awash at high water, 0.6 mile northeastward of **Sarkar Point.** A 3¾-fathom patch is 0.2 mile eastward of Graveyard Island.

Deweyville, on the north side of Sarkar Cove, consists of an abandoned cannery, a few houses, and the ruins of a wharf.

Salt Water Lagoon is about 0.5 mile northeastward of Sarkar Cove. It is connected with sea level in **Tunga Inlet** by a short rapids. Water ebbs from the lagoon for about 2½ hours after low water. At slack water, about 2½ hours after high water, a launch drawing 4 feet may pass through the entrance into the lagoon. There is a trail from Deweyville to the lagoon.

Clam Cove is a small cove about 1.1 miles northward of Sarkar Cove. **Clam Island** and rocks block the southern part of the entrance. The head of the cove is shoal. Mariners should navigate with caution, referring to the latest edition of the chart.

Rocky Cove is a small cove about 0.4 mile northward of Clam Cove. In midchannel, off the entrance, is a rock awash at minus tides with deep water on all sides; it is marked by kelp. The cove is foul.

Tenass Pass, northward of **Spanberg Island,** and **Brockman Pass,** southward of the island, connect Tokeen Bay with El Capitan Passage. Both passes bare at low water. Tenass Pass carries slightly more water than Brockman Pass, but is very narrow, having a width of 25 feet at one place where the current exceeds 5 knots at times. Boats drawing 7 feet have gone through Brockman Pass on extreme high tides.

Chart 8172.—Sarheen Cove is on the eastern shore of El Capitan Passage about 5 miles northward from Sarkar Cove and about 6.5 miles southward from Aneskett Point. Depths of 8 to 10 fathoms were found within the cove except toward the head where it is shoal.

Devilfish Bay is on the western side of the passage 3.5 miles southward of Aneskett Point. The bay consists of two parts connected by a narrows; the eastern part has depths of 40 to 50 fathoms at the entrance, shoaling to 13 to 14 fathoms 0.2 mile from the narrows. The bight in the northern corner of this part of the bay is shoal.

The narrows, about 170 yards wide, expands into an arm with depths of 12 to 14 fathoms to within 0.5 mile of the head. The narrows is constricted by a rock in midchannel, awash at high water. Depths of 3 fathoms westward and of 5 fathoms eastward of the rock were found, but the channel should not be attempted until seen at low water. Currents of 2 to 3 knots were observed in the vicinity of the rock.

Aneskett Point, bold and wooded, is on the western side of the passage where its trend turns from northward to westward. Northward from the point is a wooded island which may be passed on either side.

The channel then favors the southern shore until about 1.8 miles west of Anaskett Point where it takes a turn to the southward and narrows. Here a small wooded islet in the midchannel should be left to the westward. Then for 1.5 miles a midchannel course should be followed to the eastern end of a Federal project 3 miles long which provides for a 12-foot channel dredged through 7 shoals, including **Dry Pass,** to the western entrance of El Capitan Passage at Shakan Strait. In 1959, the controlling depth in the dredged portion of the passage was 11½ feet. The dredged portion of the channel is marked by daybeacons and an unlighted range near its western end.

7. SUMNER STRAIT

Chart 8201.—Sumner Strait is one of the great inlets into southeastern Alaska from the sea. The strait has three entrances. The main entrance from the sea, between Coronation and Warren Islands, is about 5.8 miles wide. Warren Channel, the entrance east of Warren Island, between it and Cape Pole, is about 1.2 miles wide and is used by vessels bound to and from Davidson Inlet and Bucareli Bay. Decision Passage, the entrance between Cape Decision and the Spanish Islands, is about 1 mile wide and is used by vessels bound to and from Chatham Strait. These entrances are described under separate headings.

The usual route of vessels bound north from Clarence Strait is by way of Snow Passage or Stikine Strait to Sumner Strait, and thence to Wrangell Narrows. Vessels too large to make the passage through Wrangell Narrows with safety continue westward through Sumner Strait, round Cape Decision, and go northward through Chatham Strait or westward to sea by way of Cape Ommaney. In fog or thick weather, vessels bound around Cape Decision, instead of using the channel northward of Spanish Islands, can continue southward and round Helm Point, entering Chatham Strait between Hazy Islands and Coronation Island, or pass to sea southward of Hazy Islands. Nearly all of Sumner Strait has been examined and the dangers are shown on the chart.

Currents.—From the southern entrance to Sumner Strait in Iphigenia Bay, the current floods northward to the vicinity of Point Baker, where it turns eastward with an estimated velocity of 2 knots. West of Zarembo Island the current divides. One branch passes through Snow and Kashevarof Passages and meets the flood current from Clarence Strait near Key Reef. The second branch sets northward and eastward of the island until it meets and is overcome by the current from the Stikine River. The edge of the current from the Stikine River is well defined by its muddy white appearance. Near the end of the ebb, it is sometimes noticed to be westward of Vank Island and southward in Chichagof Pass and Stikine Strait.

The ebb current flows from the vicinity of Wrangell through Sumner Strait and through Stikine Strait and Chichagof Pass to Clarence Strait. Through the length of Sumner Strait, including passages at the entrance, ebb velocities of 3 to 4 knots appear to be the rule. Between Point Baker and Strait Island, the irregularities of the bottom produce heavy swirls and surface disturbances.

It is reported that strong currents and heavy tide rips occur off Cape Decision, Fairway Island, Point St. Albans, and the small islands to the northward.

For daily predictions, see the Tidal Current Tables.

Chart 8152.—Iphigenia Bay extends between the Maurelle Islands on the east and Coronation Island on the west, and is the approach from the sea to Sumner Strait, Warren Channel, Davidson Inlet, Bocas de Finas, Sonora, and Arriaga Passages. The depths are generally good but the bottom is very irregular, and there are several dangers. On the eastern side of the bay, deep water prevails until within 1.5 miles of a line passing from the northwest end of St. Joseph Island to Timbered Islet to Losa Islet, where the depths become irregular.

Vessels bound from the southward for Davidson Inlet and Warren Channel should give Timbered Islet a berth of 1 to 1.5 miles; those bound for Sumner Strait should favor the Coronation Island side of the entrance. Those bound for Cape Ommaney can pass between Hazy Islands and Coronation Island on a midchannel course or pass outside of the Hazy Islands, giving them a berth of at least 1 mile.

Chart 8173.—Warren Island is almost rectangular in shape, with numerous peaks. **Warren Peak,** located near the northern end is snow covered from November to May. From northward it shows prominently as a sharp, almost conical peak. From westward, the skyline appears as a series of jagged summits; near the southern end of the island it appears lower and rounding. From the southward, the skyline appears ragged and irregular. The land rises abruptly from the shore and is heavily timbered; the peaks are generally bare.

With the exception of small stretches of sand beach in Warren Cove, False Cove, and in the two small coves in the northerly coast, the shoreline is a rocky shelf, with off-lying rocks which bare at different stages of the tide; they are from 50 to 300 yards off the west coast and about 175 yards off the southern coast.

Off the southern end of Warren Island are three groups of dangerous, rocky, unmarked shoals. The outermost group, about 2.8 miles southward of **Boot Point,** does not show but breaks occasionally with a long heavy break at low water. Another group, about 2.7 miles southwestward of Boot Point, has 2 rocks awash, one of which uncovers 8 feet. The third group, about 1.5 miles southwestward of the point has a rocky islet 15 feet high. **Cay Rocks,** with a least depth of 2¼ fathoms, are about 0.3 mile northwestward of the islet. Between the islet and Boot Point heavy tide rips were observed when the wind was against the current. Broken ground and shoals with a least depth of 2½ fathoms were found in this area, and it should be avoided.

Point Borlase is an indefinite point at the northwestern end of Warren Island. **Borlase Rock,** with two rocky

heads that bare at extreme low water, and generally show as a breaker, is 0.7 mile westward of Point Borlase. A group of rocks with a least depth of 1¾ fathoms are 1.5 miles southward of Borlase Rock and 0.5 mile offshore. A 6½-fathom spot is about 0.4 mile northeastward of the northern end of Warren Island. A large kelp patch with a depth of 3¾ fathoms is 500 yards off the northwestern shore of the island about 1.3 miles northeastward of Point Borlase.

The two small coves in the northwesterly coast of the island, close eastward of Point Borlase, offer protection for small craft in southeasterly weather. Anchorage may be had in 4 fathoms, mud bottom.

Warren Cove is on the eastern side of Warren Island, about 2 miles from the southern end. In entering, the southern shore is favored until inside the entrance. At low water a sand beach extends a considerable distance from the head of the cove. There is a small gravel beach just inside the entrance on the south side of the cove, the light color of which may often be distinguished at night.

Anchorage may be had in 7 fathoms, sand bottom, in the center of Warren Cove. A heavy swell enters the cove during southeasterly weather. At night, when approaching the cove from the southward, the entrance is not readily picked up, because the headland to the northward shows prominently, while that to the southward does not, and the entrance to False Cove is easily mistaken for that to Warren Cove.

False Cove, the small bight 1.5 miles northward of Warren Cove, affords anchorage in depths of 4 to 5 fathoms, mud bottom, behind the kelp-marked rocks awash which extend across the north half of the entrance.

Local magnetic disturbance.—Differences of as much as 4° from normal variation have been observed in False Cove.

Warren Channel leads between Warren Island and **Kosciusko Island.** No out-lying dangers were found in the channel proper, which has depths of 17 to more than 100 fathoms. Numerous islets and rocks above water, extend about 3 miles southerly from the southwest point of Kosciusko Island; **Black Rock,** the southernmost, is pointed on top. **Cape Pole** is the western point of Kosciusko Island.

The tidal currents have velocities of 2 to 3 knots. The flood sets northward and the ebb southward.

Heavy tide rips form northwestward of the entrance to Pole Anchorage.

Halibut Harbor, on the south side of Kosciusko Island, eastward of its southwest point, is protected by numerous islands and affords anchorage for small vessels in 16 fathoms. The entrance is foul and only those with local knowledge should attempt to enter.

Coronation Island is triangular in shape, divided into three peninsulas by Windy Bay on the western side and Aats Bay on the northern side, the heads of which are separated by a range 1 mile wide in the center of the island. From offshore, the northeastern peninsula shows heavily wooded ridges of moderate slopes, but without characteristics of interest to the navigator. The western and northern sides of the island are described with Chatham Strait.

The south end of Coronation Island appears from offshore to the westward as timbered ridges with gentle slopes from **Needle Peak,** in the center of the island, to Helm Point, where they terminate in yellow and reddish cliffs. The summit of Needle Peak is not very definite and shows flat with a series of sharp knobs of a grayish color.

Windy Peak, on the northwestern side of Windy Bay, is prominent. From the westward and southwestward it shows as a cone marked by a large landslide. From the northwestward and southward it shows as a flat-topped mountain with a small knob on the western end.

Pin Peak, on the northwest end of the island, is easily recognized as a long ridge covered with trees and shrubbery. Near the southern part of the ridge is a conspicuous knob or point. The ridge for several hundred feet below the summit is loose rock, without vegetation, and shows as light yellow from a westerly direction. The peak is not conspicuous from a northerly direction since it shows against higher peaks to the southward. From the summit the ridge has a rounding slope to the depression between it and Windy Peak. To the northward the slope is gradual, drops in a long hollow or concave shoulder to a height of 900 feet, where there is an abrupt and noticeable change to a steep slope which ends at the shoreline.

Helm Point, perhaps the most conspicuous and prominent headland in southeastern Alaska, is the southern extremity of Coronation Island. Differing from most of the capes and points in this section, which have moderate slopes, it rises vertically in sheer weather-beaten cliffs to a height of 1,000 feet, and ending abruptly in what has the appearance of a flat tableland. The point is cut by numerous crevices and caves, one of which shows prominently from the southward. Devoid of vegetation, of a light yellow to reddish color, barren and bleak, it is the nesting place of thousands of sea birds. Local conditions are such that it is generally visible in moderately thick weather, when other sections are not visible. In approaching Helm Point in thick weather, the lead gives very little indication of shoaling or of the existence of rocks.

Helm Point Light (55°49.6′ N., 134°16.1′ W.), 140 feet above the water, is shown from a small white house on the southern extremity of a point about 0.4 mile east-northeastward of Helm Point. This point has the appearance of a dome-shaped grassy islet, which is prominent from northeastward and southwestward. The light marks the western side of the entrance to Sumner Strait.

China Cove, just northward of Helm Point Light, is an open bight into which a heavy swell enters in southeasterly weather. The sandy bottom slopes gently and anchorage may be had in 5 to 10 fathoms.

From Helm Point to Cora Point, the coastline is marked by ledges and cliffs. Rocks extend about 500 yards offshore.

Cora Point is the extremity of a projecting ledge at the northeastern end of Coronation Island. **Cora Island,** a small wooded islet about 0.7 mile southward of Cora Point, is about 170 feet high, and has a cluster of rocks

close-to. A clump of trees on the island shows prominently from the direction of Helm Point. Small craft may find protected anchorage in southeasterly weather behind the island, in 6 fathoms, mud and gravel bottom.

The Spanish Islands are a chain of wooded islands and rocks, extending northward from the northeastern extremity of Coronation Island in the direction of Cape Decision. The southern large island has a wooded summit at its northeastern end which shows prominently from the westward. A small rocky islet with a scrub growth is 0.3 mile off the western shore.

A rock with a depth of 2 fathoms has been reported about 1.5 miles west-northwestward of the northwestern end of the southern of the Spanish Islands, but the least depth found was 9 fathoms. During severe weather the seas pile up heavily but do not break as they would on a 2-fathom spot; however, it is advisable to avoid this area.

A narrow 20-fathom channel separates Coronation Island and the southern Spanish Island. The chart shows the dangers and courses can be laid out as desired. Tide rips are usually very heavy in this channel.

A channel 120 yards wide with depths of 8 and 12 fathoms is between the southern large Spanish Island and the small islet off its northern end. Between this small islet and the small islet to the northeastward of it is a narrow channel with depths of 8 and 9 fathoms. Small craft sometimes anchor in 8 to 14 fathoms in the bight formed by these islets and the middle island.

The middle island has an elevation of 370 feet near its northern end, with a moderate slope to the southward. From offshore it appears as a flat ridge. A rocky islet, 35 feet high, is 0.3 mile off the east side of the island.

Spanish Islands Light (55°59.2′ N., 134°06.2′ W.), 47 feet above the water, is shown from a white slatted tower on the northern extremity of the northernmost of the Spanish Islands. The light marks the southeastern side of Decision Passage.

Cape Decision, the southern extremity of Kuiu Island, is a low, bare, rocky point, from which the land rises gradually to an irregular, timbered ridge. It stands out well when approached from a direction to pass through the passage between it and the Spanish Islands. Two large kelp patches 1.5 and 2 miles northwestward from the cape and about 0.8 mile off the Kuiu Island shore should be avoided.

Cape Decision Light (56°00.1′ N., 134°08.1′ W.), 96 feet above the water, is shown from a white square tower on a white square building, 75 feet high, at the south end of the cape. A fog signal and radiobeacon are at the light.

Decision Passage, 1 mile wide between Cape Decision and the Spanish Islands, is used by large vessels bound from Sumner Strait to Chatham Strait or Cape Ommaney. The passage is clear, however, the cape and the islands should be given a berth of not less than 0.2 mile. Vessels rounding the cape are cautioned to give this area sufficient berth.

The large body of water to the westward of the Spanish Islands and to the northward of Coronation Island has been closely surveyed and all dangers found are shown on the chart. After prolonged severe gales, very heavy breakers have been seen on spots where the shoalest water was found.

Chart 8201.—Cape Decision to Keku Strait.—This portion covers the western side of Sumner Strait extending southward from Strait Island. From Iphigenia Bay to Strait Island, Sumner Strait follows a northerly direction, and at Strait Island it turns eastward to its junction with Stikine Strait near the town of Wrangell.

The western side of Sumner Strait between Cape Decision and Keku Strait is indented with many inlets and bays, and has many islets, rocks, and reefs, extending from 1 to 2 miles off the main shore into the strait. The outermost dangers are marked by lighted and unlighted buoys.

Fairway Island, small and wooded, is on the west side of the south end of Sumner Strait. It is surrounded by kelp, rocks, and reefs, bare at various stages of tide. Two rocks of 6- and 7-foot height, are 0.5 mile southward of the island, and nearby is another rock which uncovers 10 feet.

Port McArthur is about 4.5 miles northward of Cape Decision. It is protected at the entrance by a group of islands and reefs, and it affords anchorage which is not secure because large swells run to the head of the bay. For small craft the most secure anchorage is in 4 fathoms, behind South Island. In bad weather the landing can be made behind the island, from where an emergency trail leads to Cape Decision Light. The entrance leads northward and westward of North Island and has a clear width of 300 yards between the kelp patches. Fresh water can be obtained from small streams at the head of the harbor.

North and **South Islands,** at the entrance to Port McArthur, are low and wooded, with surrounding ledges; they are nearly 0.5 mile apart north and south. Between them is a rocky islet and numerous rocks awash and ledges surrounded by kelp. The passages south of South Island, and between South and North Islands, are shoal and rocky and should not be attempted without local knowledge.

Two large kelp patches are 0.4 to 0.5 mile eastward of North Island. In the south patch, a least depth of 1 fathom was obtained and in the north patch, a least depth of 3 fathoms, but there is probably less water.

Kelp patches and an area of foul ground extend to the west and northward of North Island for a distance of 0.3 mile. A rock with a least depth of 4½ fathoms and marked by a buoy is located near the northern edge of the kelp, and another rock, which bares 1 foot, is near the southern edge. Both rocks are close to the east side of the entrance channel to Port McArthur.

Lemon Point, on the opposite side of the entrance channel, is low, and has several bare rocks off it. On the southeast and south sides kelp extends a short distance out, and the point should be given a berth of 400 yards in rounding into the port. A rock, covered at half tide, 0.4 mile east-northeastward of the outer bare rock off Lemon Point is marked by **Lemon Point Rock Light**

(56°04.4′ N., 134°06.6′ W.), 26 feet above the water and shown from a small white house on a skeleton tower on a pier. The rock is surrounded by kelp and is the only serious danger on the west side of the channel.

To enter Port McArthur, pass northward and westward of the entrance buoy and southeastward of Lemon Point Rock Light. When the outer rock off Lemon Point is abeam, round the point and keep in midchannel to the anchorage.

The shores of Port McArthur are steep-to, the 5-fathom curve being less than 100 yards off the high-water line except at the head of the bay. Anchorage depths are about 16 fathoms with the exception of southward of Lemon Point where there is a depth of 12 fathoms.

Affleck Canal, the entrance to which is westward of Point St. Albans and northwestward of Fairway Island, is 14 miles long in a northerly direction. The depths in general are great but very irregular, especially near the shores and at the head of the canal.

Marble Islet, named from its formation, marks the western point of the entrance to Affleck Canal. There are several small islets near it.

Bush Islets, on the south side of the entrance to Kell Bay, are three in number, and from 10 to 12 feet high. The two northerly islets are sparsely wooded. The area to the westward is foul and covered with thick kelp during the summer months.

A dangerous rock, over which there is a depth of 1 fathom, is in Affleck Canal, 1,300 yards 151° from the center of Bush Islets. From this rock a kelp patch extends in a northwesterly direction for about 250 yards.

Kell Bay is about 7 miles northward of Fairway Island on the western side of Affleck Canal. One mile inside the entrance and about 500 yards off the southern shore is a wooded islet 10 feet high; deep water exists between this islet and the southern shore of the bay. An area of foul water, marked by thick kelp in the summer, extends for a distance af about 0.4 mile northwestward from the northern end of the islet. Within this area are several rocks and islets, bare from 3 to 15 feet at high water, and in addition, there are rocks with from 2 to 9 feet over them at low water. The northern shore of the bay is very broken, with numerous indentations, wooded islets, and rocks.

At the head of the bay are two arms extending in a northwest and southwestern direction. The northwestern arm is about 1.5 miles in length. Two wooded islands and numerous rocks mark the south side of the entrance. Vessels entering this arm should proceed with caution, favoring the north shore until abreast the largest wooded islet, and then favor the south shore in order to avoid the rocks awash, and bare 8 feet at low water, near the north shore. The entrance to the extreme head of the arm is blocked by obstructions which do not permit entry of even small vessels at low tides.

The southwestern arm is separated from the main body of Kell Bay by three wooded islands. To enter, pass midchannel between the islands and the southwest shore, follow the southwest shore at a distance of 150 yards until the south point of the west island has passed abeam. Then stand in midchannel, taking care to round the south side of the island at a distance of 200 yards so as to avoid the ledge extending about 150 yards offshore. Anchorage may be had in 9 to 12 fathoms, soft botton.

The basin at the head of the southwest arm affords excellent anchorage for small craft in depths of 4 to 5 fathoms, soft bottom. The entrance is constricted, being only 30 to 35 yards in width, and vessels entering are advised to proceed with caution keeping close to the western shore, which is abrupt and steep-to.

Affleck Canal is clear eastward of the small wooded islet, about 10 feet in elevation, about 1 mile northward of Kell Bay. There are several rocks in the immediate vicinity of this islet. A lagoon, connected with Affleck Canal at high water, lies on the western shore about 2 miles northward of Kell Bay.

Bear Harbor is on the west side of Affleck Canal, about 4 miles northward of Kell Bay. From the entrance to its head, it is about 2 miles long in a northwesterly direction. The harbor has three arms; the eastern is deep and open to the south; the middle and western arms are sheltered and afford suitable anchorage for small vessels. The approach to these two arms is south of the island at the entrance. The deepest part of the channel, about 5¼ fathoms, is 100 yards off the shore of the island. Favor the shore of this island in entering and navigate with caution. After having passed the eastern tip of the island abeam by 100 yards, a midchannel course will lead over a ½-fathom spot marked by kelp. This spot is the end of a reef making out from the southern shore.

After passing the entrance, midchannel courses lead into the west arm which is deep except along the south shore near the head.

A midchannnel course is followed in the middle arm until about 1 mile from the entrance when the eastern shore is followed at a distance of about 200 yards. This arm is deep to within 0.5 mile of its head where it shoals gradually to the tidal flats off the mouth of the principal streams emptying into Bear Harbor.

On the western shore of Affleck Canal, about 2 miles northward of Bear Harbor, is a grass-topped islet, about 5 feet high. A depth of about 10 fathoms can be carried to about 1 mile south of the head of the canal by favoring the western shore at all times in order to avoid the extensive kelp patches and shoals in the eastern side. About 1 mile south of the head of the canal, the eastern shore is foul and studded with rocks; the foul area extends from 300 to 400 yards offshore.

The two main inlets on the eastern side of Affleck Canal are not recommended as shelter; the heavy groundswell runs into both, well toward their heads. The entrances of both are free of obstructions. The southern inlet, which is about 500 yards in length, is about 5.5 miles northward of the eastern entrance point of Affleck Canal. Inside are depths of 5 to 7 fathoms, soft bottom. A group of rocks which bare 7 feet and surrounded by kelp, are about 0.7 mile 232° from the southern entrance point of this inlet.

The northern inlet about 1 mile farther northward, has an entrance about 350 yards in width, and extends east-

ward for about 0.8 mile. In its center are depths of from 9 to 12 fathoms. Vessels desiring to enter this inlet should favor the northern shore as a rock, which bares 6 feet, is about 340 yards inside the entrance and about 70 yards off the southern shore.

Point St. Albans is about 7.5 miles northeastward of Cape Decision. Rocks and heavy kelp extend 1.1 miles southward, and a 3-fathom spot is 1.6 miles southward of the point; heavy tide rips and swirls may be experienced off this extensive kelp patch. Off-lying rocks and reefs extend to a distance of 0.3 mile offshore along the east shore of Affleck Canal to the point opposite Marble Islet.

Point St. Albans Reef is an extensive foul area, about 1.6 miles east-northeastward of Point St. Albans. The highest part of this area is a rock awash at high water, in the northwestern part of the kelp patch. There are numerous other rocks which bare at various stages of the tide. A lighted whistle buoy is off the end of the reef.

From Point St. Albans to **Point Amelius,** islands and reefs extend offshore to a distance of 1.5 miles. This section of the coast is foul and marked by kelp. A rock awash at low water is in the kelp patch about 2.8 miles northeastward of Point St. Albans. There are passages between and inside the group of islets located 4 miles northward of Point St. Albans. This area is foul, with numerous rocks and kelp patches, and only those with local knowledge should enter. Small vessels may find shelter in the two small bays 3 miles and 4.5 miles northward of Point St. Albans. The bays are exposed to the eastward and there are shoals off the approaches.

Amelius Island Shoal, a rocky shoal with a least depth of 4 fathoms is about 1.8 miles southeastward of **Amelius Island,** the outermost islet off Point Amelius. A lighted buoy is on the eastern side of the shoal. Deep draft vessels should avoid passing close to the buoy.

The bight westward of Point Amelius is exposed to southeast and is of no importance as an anchorage except for temporary purposes. **Louise Cove,** on its western side near the head, affords anchorage for small vessels in 7 fathoms.

Port Beauclerc is a large arm on the western side of Sumner Strait, the entrance to which is about 11 miles northward of Point St. Albans and 10 miles south-southwestward of Point Baker. **Beauclerc Island,** small and wooded, is off the middle of the entrance, with a wooded islet close north of it.

Beauclerc Island Light (56°15.4′ N., 133°51.0′ W.), 30 feet above the water, is shown from a white wooden house on a rock on the east side of the island. A reef extends 300 yards eastward from the small wooded islet.

The narrow passage south of **Edwards Island** is clear and deep in midchannel. The eastern shore of the cove, northwest of Edwards Island, is formed by a small island with a very small islet off its northern end. A sunken rock is close to the western shore of the northern end of the islet. The entrance to the cove is northward of the islet. A 3-fathom spot is about 350 yards northward of the point on the western side of the cove.

There is anchorage, exposed to the southward, in the bight on the eastern shore, 3 miles from the entrance to Port Beauclerc.

Anchorage in Port Beauclerc may be had northward of the small island which is about 2 miles northward of Edwards Island, but the anchorage is obstructed by a large kelp patch, with a depth of 3 fathoms and possibly less, which is 0.7 mile northward from the small island. Good anchorage may be found south of Edwards Island in 20 fathoms, sand bottom; enter from the east in midchannel on a course of **278°**. Small-boat anchorage is available in the small cove west of the charted rock awash on the south side of this island, or in the cove on the Kuiu Island side south of the east end of Edwards Island.

Anchorage may also be obtained in the southern arm in 7 or 8 fathoms, mud bottom. Enter by the narrow passage south of Edwards Island and slightly favor the eastern shore of the arm to avoid a sunken rock, marked by kelp, 1 mile westward of the western end of the narrow passage south of Edwards Island. On the eastern shore of the arm 1 mile southeastward from the narrow passage is a point close to which is a 3½-fathom spot.

Caution.—Where local knowledge is lacking, caution is advised in entering Port Beauclerc.

Boulder Point, about 4 miles northward from Beauclerc Island, is a bold rounding point with numerous rocks close-to.

Reid Bay is on the western side of Sumner Strait, 3 miles northward of Boulder Point. It has two islets and several outlying rocks along its northwest shore and a rock awash south of the islets and in midchannel. Small craft may anchor in the cove on the west side of the peninsula point on the south side at the entrance to the bay in 5 to 6 fathoms, mud bottom. There are dangers off the points at the entrance to this cove and it should be entered with caution. A kelp-marked reef is in the approach to Reid Bay 1.2 miles west-southwestward of the south end of Sumner Island. A rock awash is about 0.6 mile 270° from this reef.

Sumner Island is 4.3 miles north-northeastward of Boulder Point. It has steep, rocky shores and is surrounded by small rocky islets which extend northwestward to Kuiu Island and southeastward from the southeast point of the island for about 0.5 mile. Several reefs extend a short distance off the northeast shore of the island and should be approached with caution.

Alvin Bay, northwestward of Sumner Island is clear of dangers except well into the bay where it narrows. At this point a small islet is on the south side of the bay with a rock between it and the southern shore; there are also rocks north of the islet.

To enter, pass north of the islet leaving the detached rocks on the starboard side. Good anchorage may be had inside in 4¼ fathoms, mud bottom. With caution, this entrance can be made easily. The bay is used extensively for anchorage during the fishing season.

Strait Island is in the middle of Sumner Strait 3 miles northwestward of Point Baker. It is divided into two parts at high water, and is low and wooded. **Mariposa Reef,** which partly bares, extends nearly 0.8 mile south-

ward from the island, where it is marked by a lighted bell buoy.

Warren Channel to Point Baker.—This portion covers the eastern shore of Sumner Strait below Strait Island. Shipley Bay, Shakan Bay and Strait, and Port Protection are the important harbors in this section. The coast is bold and rugged with many off-lying rocks and islets. Calder Rocks and Helm Rock are the principal offshore dangers.

Chart 8173.—Pole Anchorage, on the east side of the south end of Sumner Strait, affords an anchorage for small vessels, protected from northeast and southeast winds; it is exposed to westerly winds and swells. The southwestern point of the entrance is a large mass of grassy-topped rocks, about 10 feet high, extending about 0.6 mile north of **Cape Pole**; the passage between them and the cape has many bare rocks and nearly dries. There is considerable kelp for some distance northward of the grassy-topped rocks. The north point at the entrance is a wooded islet close to shore; kelp extends some distance northwest of it, also about 100 yards westward.

Anchorage can be had in 10 to 11 fathoms, mud bottom, with the north end of Warren Island showing about midway between Cape Pole and the grassy-topped rocks. Small fishing vessels may find suitable anchorage southeastward of Cape Pole, eastward of a large kelp patch, in any desired depth.

Fishermans Harbor, a bight northeastward of Pole Anchorage, is used extensively by trollers and other small fishing craft. It has a trading post. An ice and cold storage firm maintains a store on a float where gasoline, oil, and fresh water are available. The float is 150 feet long and has a depth of 16 feet alongside. Radio communication is maintained during the summer with Alaska Communication System.

Fishermans Harbor Outer Light (55°58.3′ N., 133°47.9′ W.), 21 feet above the water, is shown from a white daymark on an I-beam, off the edge of the reefs on the east side of the westerly entrance to the harbor. An inner light is shown from a small white house on the edge of the reef on the southeastern side of the harbor.

To enter Fishermans Harbor, steer **149°**, leaving the outer light from 35 to 40 yards to the eastward and heading for the inner light. Continue this course until the fish float and a group of piling near the west shore are on range and then haul gradually southward. When abreast of the float, anchor in any desired depth. The channel has a controlling depth of 2½ fathoms about 100 yards southward of the outer light but deepens gradually when approaching the float.

Point Hardscrabble, about 2.5 miles northward of Cape Pole, is not very prominent. Two small islets are about 500 yards westward of the point. There are depths of from 5 to 11 fathoms between the extensive kelp patches which are between the islets and the point. A small cove, 5.5 miles north-northeast of Cape Pole, affords protection from southerly weather for small vessels but is open to northward.

Chart 8172.—Ruins Point, 8 miles north-northeast of Cape Pole, is on the south side of the entrance to Shipley Bay. The point is poorly defined, and has no prominent features. Foul ground extends 0.4 mile from the shore in the vicinity.

Shipley Bay is about 10 miles northward of Cape Pole. Good anchorage is available at the head of the bay. **Bluff Island,** 200 feet high and wooded, is in the middle of the entrance. The vertical eastern face is a rookery for sea birds; the western side has gradual slopes. Islets and rocks extend about 0.4 mile from the westward extremity of the island.

The southern approach to Shipley Bay extends between the southerly tip of Bluff Island and a tiny islet 0.5 mile north of the south shore. The area between the islet and the south shore is mostly foul and passage should not be attempted except by small craft with local knowledge. A rock awash at minus tides is 1 mile southeast of the southerly tip of Bluff Island; navigable water extends on all sides of this rock which is surrounded by thick kelp and is easily distinguishable at all stages of tide during summer months. From a small wooded islet on the north side of the entrance, foul ground extends for about a mile southeastward. This constricts the passage to a width of only about 0.3 mile along the south shore. Eastward of this point, however, the bay is generally clear although the depths are irregular and there are several rocks 100 to 200 yards off the south shore.

About 4 miles from the entrance, the bay is constricted by a promontory jutting out from the south shore. A small wooded islet surrounded by foul ground is off the point. West of the point is a large bight in which are two islands. Anchorage in 3 to 10 fathoms is available in the bight west of the islands, poor holding ground. Winds are reported to draw with great force through the gap to the south during southeasterly storms.

The best anchorage is near the south shore at the head of the bay, just eastward of the point 1 mile from the head of the bay, in depths of 15 fathoms, mud bottom, and good holding ground. A small cove just west of the point is suitable for small craft; depths are 3 to 5 fathoms, mud and sand bottom.

Shipley Bay may be entered safely from either side of Bluff Island.

Shakan Bay is on the east side of Sumner Strait about 5 miles north-northeast of Ruins Point. The bay, including Shakan Strait, is circular in shape. Its entrance is between Shakan Islet on the south and the Barrier Islands on the north. The center of the bay is almost filled with islands. At the eastern extremity of Shakan Strait, the bay connects with El Capitan Passage.

The north shore of the bay is foul for about 1 mile offshore and should be avoided. The eastern part of the outer bay is extremely foul.

The Nipples, 1 mile southeast of Shakan Strait, and Mount Calder, north of the bay and 2 miles northeastward of Barrier Islands, are good landmarks for the bay.

Station Islet, off the south point at the entrance, is marked by **Shakan Bay Light (56°09.0′ N., 133°37.5′ W.),** 25 feet above the water and shown from a small

white house on a brown skeleton structure on the north side of the islet.

Shakan Islet, 0.3 mile westward of Station Islet, is about 18 feet high and is covered with scrubby trees. A 3-fathom shoal is 1.2 miles southwest of the islet. Between this shoal and the point, 0.8 mile southeast of it, there are several detached rocky shoals, all marked by kelp.

Shakan Strait, comprising the southern part of Shakan Bay, is about 4 miles long, averages 0.4 mile in width, and is semi-circular in shape. It affords a clear and safe route to El Capitan Passage. The west entrance, marked by a daybeacon on an islet off the southwestern end of Hamilton Island, is 0.3 mile wide, but between the 5-fathom curves is constricted to about half that, by reefs on both sides. About midway of its length, there is a 5¼-fathom rocky shoal in midchannel about 0.2 mile eastward of the daybeacon marking the southeastern end of Hamilton Island. Off-lying dangers are few, and none are more than 100 yards offshore.

Only traces remain of the abandoned Shakan village and cannery, about 0.8 mile south of the entrance to El Capitan Passage.

Hamilton, Middle, Divide, and **Fontaine Islands** are heavily wooded islands in the center of Shakan Bay. Of the several passages between and around them, Shakan Strait is the principal one; the others are used only by small craft with local knowledge.

Mount Calder, a sharp concical peak projecting above the dark timbered slopes, is an outstanding landmark. Easily identified by its light-gray color, it can be be seen from the entrance to Sumner Strait in clear weather.

Calder Bay is on the north side of Shakan Bay. There are off-lying dangers. Depths shoal gradually from 9 fathoms at its entrance to the tidal flat about a mile from the entrance.

Local magnetic disturbance.—Differences of as much as 6° from the normal variation may be expected in Shakan Strait.

Enter Shakan Bay with Beauclerc Island Light astern and Shakan Bay Light a little on the starboard bow.

In entering Shakan Strait, favor the north point slightly. When 1.2 miles inside the entrance to the strait, favor the north shore slightly, otherwise follow a midchannel course to the anchorage off Shakan, a distance of 4 miles. Anchor about 0.3 mile offshore in 7 to 9 fathoms, mud bottom.

At night, deep shadows make it difficult to distinguish the entrance to the channel between Hamilton and Kosciusko Islands. The channel between Divide Island and Middle Island is used by small craft.

Barrier Islands, on the north side at the entrance to Shakan Bay, are two islands, with numerous rocks and islets around and between them. The western island is about 200 feet high, the eastern island about 350 feet, and both are nearly level and wooded. A reef extends about 0.8 mile southward from the south point of the western island. A rock with 1¼ fathoms over it, about 0.7 mile 272° from that point, is marked on the western side by a lighted bell buoy.

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Calder Rocks are a dangerous kelp-marked reef off the eastern shore of Sumner Strait, the southernmost point of which is 2 miles northwestward of the barrier islands. From this southernmost point, which bares 3 feet, the reef extends 1.2 miles in a northerly direction with little depths over it and with deep water close-to. A lighted whistle buoy is close westward of the northern end. There is a good passage on each side of Calder Rocks; the eastern one is generally used by small craft, and the western one is used by larger vessels.

Chart 8174.—Hole in the Wall is a small cove on the east side of Sumner Strait, 2.5 miles northward of Barrier Islands, the entrance of which is through a vary narrow passage 0.5 mile long, between high bluffs, and opens into a basin 400 yards in diameter. Two rocks that bare are in the narrow entrance. Depths in the basin are from 3 to 7 fathoms; it may be used for anchorage, but is subject to strong winds drawing through the entrance. The bottom is sand and mud. Small craft pass through the narrow entrance only at half tide or higher water.

Labouchere Bay is about 4 miles southward of Point Baker. It is studded with islets and rocks, the entrance being partially closed by Labouchere Island and the islands and reefs extending southeastward of it to the shore.

There is sheltered anchorage for small vessels just inside the bay on the southern side in depths of 3 to 21 fathoms, mud and sand bottom. Three detached rocks which cover at half tide are near the head of the anchorage. Small fishing craft anchor southeast of the rocks and near the sand beach in 2 to 5 fathoms. The recommended entrance to Labouchere Bay is from the northwest. Small fishing vessels may enter Labouchere Bay from the southward on a northerly course, through a channel passing east of the kelp-marked submerged reef at the entrance, 0.5 mile southeastward of Labouchere Island and avoiding the large kelp beds on their right.

Protection Head, a bold white bluff, 1 mile northward of Labouchere Island, is an outstanding landmark visible from the southward for many miles.

Port Protection has its entrance 1.5 miles southward of **Point Baker,** the northwestern extremity of Prince of Wales Island, and 1.5 miles northward of Protection Head. The entrance is marked by **Port Protection Light (56°19.6′ N., 133°36.6′ W.),** 15 feet above the water, shown from a small white house on the northwestern end of the wooded island on the southwestern side of Wooden Wheel Cove, 1 mile inside the entrance, and by a daybeacon on a detached reef, 0.3 mile off the north shore. It has good anchorage for large craft 1.7 miles in from the daybeacon and southwest of the chain of small wooded islands in the upper half of the bay, in 6 to 18 fathoms, mud and sand bottom. A more sheltered anchorage may be had east of the chain of islands.

To reach the second anchorage, proceed from the first on an easterly course, keeping the two northerly of the small wooded islands to the northwest. Pass close to the tangent of the larger island on the right. Depths in the passage between the islands are 6 to 11 fathoms. Di-

rectly ahead and about halfway between the island, passed on the right, and the eastern shore of the bay there is good anchorage in 10 fathoms, mud bottom. The best shelter is in the bay, affording protection in all weather. Small vessels may find anchorage in 5 to 8 fathoms a little farther in.

Port Protection, a trading post and fish-buying station, is a settlement with a general store that supplies food, gasoline, oil, fresh water, and some repair parts for boat machinery. A small-craft float, 370 feet long, has depths of 5 to 8 fathoms alongside. Radio contact is maintained daily with the Alaska Communication System. The settlement is on the northeast side of the port in **Wooden Wheel Cove** behind the wooded island and inshore from Port Protection Light. There are some homes and a shrimp cannery along the beach. A ship may enter Port Protection on either side of the daybeacon in the entrance, being careful to pass the shoal at a safe distance.

The shores of Port Protection are usually fringed with kelp, and the soundings, though deep, are irregular and the bottom rocky. There is a log boom across the mouth of the cove about 0.9 mile southwestward of Port Protection Light, and other log raft mooring facilities are in the vicinity.

Point Baker (P.O.), a permanent settlement on the inner bay east of Point Baker and south of Point Baker Anchorage Light, is a trading post. There are two fish-buying stations, and food, fresh water, gasoline, oil, and fishermen's equipment are available. The mail boat calls weekly with supplies and mail. There is a float 250 feet long with depths of 3 to 9 fathoms alongside. Daily radio schedule is maintained with Alaska Communication System. Planes call frequently during the summer with mail and passengers. The shores of the bay are steep-to and lined with thick kelp. The midchannel passage, with a controlling depth of 4 fathoms, leads to the float at the post office; it is safe for small craft. The inner bay is restricted by several submerged off-lying dangers and is not recommended as an anchorage. This port is used extensively during the fishing season.

Point Baker Anchorage Light (56°21.4′ N., 133°37.1′ W.), 16 feet above the water, is shown from a small white house on the east side of the passage into Point Baker Anchorage. A narrow restricted passage, extending from the head of Point Baker Harbor into Port Protection, is used considerably by very small craft drawing up to 3 feet at half tide or higher.

Helm Rock with 2 fathoms over it, marked by a lighted whistle buoy, is on a line between the south point of Strait Island and Point Baker and 0.8 mile from the latter. There are usually heavy tide rips and swirls around it. A rocky shoal with 3 fathoms over it, is 700 yards north-northeastward of Point Baker. The usual course is midchannel between Point Baker and Strait Island. Small craft frequently pass between Point Baker and Helm Rock to avoid the current and swirls around the rock.

Merrifield Bay, 1 mile eastward of Point Baker is good anchorage for small vessels in 8 to 10 fathoms, mud bottom, but is open to the northward. On the western side at the entrance are several bare rocks, and a little west of the entrance and 300 yards offshore is **East Rock (Twin Island),** a large rock, awash at highest tides.

Chart 8201.—Keku Strait connects Sumner Strait with Frederick Sound and separates Kuiu Island from Kupreanof Island. The strait consists of three parts: a large bay at the southern and northern ends, and a narrow, intricate passage, about 18 miles long, known as Rocky Pass, which connects the two bays. The following description covers the southern bay and Rocky Pass. The northern part is described with Frederick Sound.

The bay forming the southern entrance to the strait is very foul, particularly the east and northeast shore. Navigation through any portion of the bay should be with caution. The entrance to the bay is between Sumner Island and Point Barrie.

In the southern bay, anchorage can be had about 300 yards off the eastern shore, eastward of Meadow Island. Anchorage can also be had in Threemile Arm, or in the northeastern part of the bay, eastward of the entrance to Rocky Pass.

Point Barrie forms the eastern point at the southern entrance to Keku Strait. Reefs and shoals extend from 0.5 to 1 mile off the point. **Barrie Islet,** 0.9 mile southeastward of the point, is a wooded islet making a good mark for entering Keku Strait from the eastward. Foul ground extends from the islet to the shore.

Westward and northwestward of Point Barrie are numerous off-lying rocks, reefs, and islets. **Trouble Island,** 2 miles north-northwestward of Point Barrie, is a prominent wooded islet lying at the outside edge of the foul area. Small craft with local knowledge can follow an irregular passage through this area, but this should not be attempted when the extensive kelp beds are not showing.

Conclusion Island is the large densely wooded island, about 3 miles northward of Sumner Island; it has several peaks and is generally steep-to.

No Name Bay, about 3 miles westward of Conclusion Island, is constricted at its head by several wooded islets. There is anchorage suitable for small craft near the head.

Seclusion Harbor is a small inlet about 3.5 miles north-northwestward of the western end of Conclusion Island. A chain of islands is eastward of its entrance. The southernmost, and largest of these islands, is used as a fox farm.

Threemile Arm makes off to the westward at the northwestern end of the bay. Its entrance is much obstructed by rocks. By proceeding with care, vessels can enter passing northeastward of the islet in the middle of the entrance, and find good protected anchorage in the middle of the arm in 5 to 8 fathoms, soft bottom.

Meadow Island is a low, wooded island in the eastern part of the bay, 4 miles northward of Point Barrie. The island is used as a fox farm. Foul ground extends 300 yards to southward and 0.6 mile northward of the island.

Chart 8272.—Skiff Island is low and wooded and is surrounded by rocks and reefs. The island is used for a fox farm. A small-boat passage is eastward of the island.

About 1.2 miles westward of Skiff Island is a small, wooded island, divided at high water. The cut is quite prominent from eastward and westward. The south point of the island is a bold, light-colored cliff, easily identified.

Monte Carlo Island is a relatively large, low, wooded islet lying 2.5 miles south-southwestward of the entrance to Rocky Pass. It is surrounded by foul ground, particularly to the south, east, and north. Clear of the foul ground to the northward, there is a passage leading to the westward which affords indifferent anchorage in 6 to 7 fathoms, sticky bottom. The small cove north of the island affords anchorage for small craft, but the entrance is difficult on account of the numerous rocks and reefs.

Rocky Pass has its southern entrance about 8 miles northward of Point Barrie, where it is marked by **Keku Strait Light (56°34.1′ N., 133°43.6′ W.)**, 12 feet above the water and shown from a small white house on a point on the west side of the entrance.

A Federal project provides for a channel dredged to a depth of 5 feet through Devils Elbow and The Summit, the shallowest parts of the pass. The project was completed in January 1960 to project depths.

The pass is used by fishing vessels, cannery tenders, and tugs with log rafts. The draft which can be carried through depends on the tide. It is reported that 12 feet can be carried through 40 percent of the time, with a resultant saving of from 30 to 80 miles. The channel is well marked. Due to the strong currents, narrow channel, and sharp turns, it is advisable to make passage at or near high water slack.

The depths through Rocky Pass are generally shallow and small craft can anchor practically anywhere with the aid of the chart. Larger craft can enter the southern end of the pass for a distance of 2 miles until opposite **Tunehean Creek** and select anchorage according to draft, either to northward or southward of the daybeacon off the mouth of the creek. At the north end of Rocky Pass, larger craft can anchor in Big John Bay, Stedman Cove, or in the channel as far south as 1 mile below High Island.

Devils Elbow, about 14 miles northward of Point Barrie and 4.7 miles northward of Keku Strait Light, is the most dangerous part of the pass. The channel here makes a full right-angle turn. It had a controlling depth of 5 feet in 1960.

Local magnetic disturbance.—Differences of as much as 3° from the normal variation have been observed in the Devils Elbow in the vicinity of 50°38′ N., 133°41′ W.

Beck Island is a small island in the center of the pass about 0.8 mile southward of Summit Island. South of Beck Island is a smaller island with off-lying rocks awash to the southward.

Summit Island, a relatively large island about halfway through the pass, lies at the southern end of the most constricted portion of the pass, known as The Summit. The island is low and wooded to the high-water mark, with large tide flats about the northern and eastern sides. A daybeacon marks the northwest corner of the island.

The Summit is the narrow, well-marked passage westward and northwestward of Summit Island, through which a channel has been dredged. The channel had a controlling depth of 5 feet in March 1960. Passage through The Summit should be attempted only with local knowledge.

Local magnetic disturbance.—Differences of as much as 4° from normal variation have been observed in Keku Strait, northward of The Summit, in the vicinity of 56°42′ N., 133°44′ W.

High Island is the largest island in Keku Strait. The western arm of the island has a conspicuous conical peak. Boats awaiting the tide often lie off the northwest point of this portion of the island. There are several clusters of mooring piles close-in along the shore just south of the point and anchorage in 12 to 18 feet can be secured just northeastward of the point.

Beacon Island marks the turn in the general direction of the pass from northerly to westerly. A daybeacon is near the west point of the island. A low water rocky ledge extends all around the island to the extent of 125 yards east of the island and 300 yards southwest of the island.

Passage eastward of Beacon Island leads into **Big John Bay,** a large bay extending north and east of Horseshoe Island. Fishing vessels often anchor in the southeast arm of Big John Bay in 18 to 24 feet, soft bottom. This anchorage is protected from all directions except the northwest. The northern part of Big John Bay is considered a good game country. Entering from the westward the channel leads northward of Horseshoe Island and between the larger two of the islands westward of Horseshoe Island; the entrance is marked by a daybeacon.

Berry Island is small but quite prominent in the vicinity, the vegetation having a rather distinct shade. The island is on a reef that is marked by a daybeacon on the eastern end. At high water, care should be taken to avoid trying to pass between the island and the daybeacon.

Stedman Cove, the deep bight in the southwest shore of **Horseshoe Island,** affords the best anchorage in the vicinity for small craft; it is well protected from almost every direction, particularly from southeast and from north to northwest. It is a convenient place to await favorable tidal conditions before proceeding southward through the pass.

When entering the cove, care should be taken to avoid the long sand spit extending about two-thirds the distance across the entrance from the east shore. The point of this spit is usually marked by a pole. Continue beyond the second point along the eastern shore and anchor in 12 to 18 feet in the inner cove. A fox rancher has a permanent residence on the southern shore of the inner cove.

Entrance Island, a long narrow island marking the northern entrance to Rocky Pass, is low and wooded to the high-water line. A daybeacon is on the southwest point of the island. A low-water ledge extends 225 yards off the southern shore of the island. Strong tidal currents run around the north end of Entrance Island, and this area is not very favorable for use as an anchorage. Even

the head of the bight northeastward of Entrance Island is a poor anchorage area, being too exposed.

Tides.—The range of tide at The Summit is approximately the same as at Ketchikan, but the time of tide occurs about ½ hour later than at Ketchikan. In the southern and northern bays of Keku Strait, the range of tide is about 0.8 of that at Ketchikan, and the time of tide is about the same as at Ketchikan.

Currents.—The flood current enters Keku Strait at both ends and meets in varying places between High Island and The Summit. At the entrance to Rocky Pass the tidal current has a velocity at strength of from 1 to 1.5 knots.

At Devils Elbow the velocity of current is from 5 to 7 knots, this being the strongest current encountered in the pass. Slack water occurs at practically high and low water. The period of slack at low water lasts only 5 or 10 minutes and the current attains considerable velocity within a half hour of this time. The high-water slack lasts considerable longer, and passage through Devils Elbow can easily be made within an hour before and after the high-water slack.

At The Summit strong currents set in within 1 hour of high-water slack attaining a velocity of 3 to 5 knots. Through The Summit and the passages north of The Summit, the currents are quite variable due to the frequent shallow depths and the intricate topography. High-water slack occurs near high water, but the ebb currrent runs for a considerable time after low water.

Directions.—Proceeding in either direction, it is best to enter Rocky Pass about 1½ to 2 hours before high water. The tidal currents meet at varying places between High Island and The Summit. At Devils Elbow and The Summit, the period of slack water is very short. There are many places at each end of Rocky Pass where vessels waiting for the tide can anchor. Strangers should make passage on a rising tide and be careful to remain in the marked channel as there are many unmarked dangers close to the channel edge.

Chart 8201.—Point Baker to Duncan Canal.—Point Baker and Helm Rock have been described earlier in this chapter.

In the open bight, 6.5 miles eastward of Point Baker, vessels may find anchorage with shelter from southerly winds in 10 fathoms, sand bottom, about 0.7 mile from shore.

Totem Bay is a large indentation on the northern shore of Sumner Strait, midway between Point Barrie and Mitchell Point. A reef extends 1.2 miles eastward from the west point at the entrance. A shoal extends 0.2 mile off the eastern point at the entrance.

To enter the bay, approach from eastward, keeping about 1 mile off **Moss Island** and about 0.5 mile off the eastern point at the entrance. The bay has depths of 7 to 8 fathoms, mud bottom, and is good protection except in southerly weather. Shoals extend over 0.2 mile from the shores of the bay.

Shingle Island, low and wooded, is about 1.5 miles southward of the entrance. Reefs extending southward of the island and detached submerged rocks are in the bay and its approaches.

The Eye Opener is a rocky ledge near the middle of Sumner Strait, about 11.7 miles eastward of Point Baker. It is marked by **The Eye Opener Light (56°23.2′ N., 133°16.4 W.)**, 28 feet above water, and shown from a small white house on a brown cylindrical base. A rock with 1¼ fathoms over it, not marked by kelp, is 0.4 mile southwestward of The Eye Opener.

Douglas Bay is a bight, open southward, lying 4 miles northward of The Eye Opener and eastward of Moss Island. It has depths of 5 to 6 fathoms, but is not important as an archorage.

Chart 8168.—Red Bay indents the south shore of Sumner Strait, 11 miles eastward of Point Baker and 3 miles westward of Point Colpoys. All known dangers are shown on the chart. It is used extensively for anchorage during the fishing season.

The entrance is through a narrow and rocky channel about 0.5 mile long, with depths of 2¼ to 4 fathoms. The narrowest part of this channel is at its southern end, and is about 50 yards wide between Bell Island and a rock which bares just west of midchannel. At about 0.8 mile southward of this point, the channel leads between two grassy rocks 2 and 3 feet high, respectively, and then westward of **Range Islet,** which is wooded. A rock, with ¾ fathom over it, is reported to lie about 100 yards 000° from the north end of Range Islet. South of Range Islet the bay is about 2 miles long and 0.4 mile wide, with depths of 5 to 15 fathoms and no dangers.

Dead Islet, small and wooded, is close to Bell Island and forms the eastern point at the entrance; a reef with bare heads extends 0.2 mile northeastward of the islet. **Pine Point** forms the northeastern entrance of the outer bay. **Bell** and **Danger Islands,** low and wooded, form the east and west sides of the narrow entrance and are separated from the main shore by shallow passes useless for navigation.

Vessels not wishing to enter or waiting for the proper stage of tide may anchor at the entrance to Red Bay in the bight west of Dead Islet. The anchorage is in the middle, northwestward of Dead Islet, in 7 to 10 fathoms, mud bottom. Larger vessels should anchor farther out with more swinging room in 18 to 20 fathoms. Inside the entrance the anchorage most used is the small bay east of **Flat Island** in 4 to 10 fathoms, mud buttom. This is good shelter in all weather. Vessels wishing to go farther into the bay may find anchorage in 5 to 9 fathoms, mud bottom.

Tidal currents in the narrow entrance to the bay have velocities of 3 to 5 knots, with very short intervals of slack at times of high and low water.

About 12 feet is the greatest draft that can be safely carried in at low water. The safest time to enter is at, or shortly before, high-water slack. All dangers are marked by kelp, but it is run under during the strength of the current.

Enter between the bare rock at the northeastern end of Danger Island and the southwestern end of Dead Islet,

favoring the latter, and then favor the western or Danger Island shore, until halfway through the passage, when the eastern or Bell Island shore should be favored to avoid the rock lying close to the southeast point of Danger Island. Bring the eastern grassy rock in line with the west side of Range Islet, which is about 0.3 mile south of Flat Island, and steer that range until near the rock, and then pass midway between the two grassy rocks and westward of Range Islet. Then follow a midchannel course up the bay and select anchorage as required.

Chart 8201.—Two miles eastward of Red Bay is an open bight, sheltered from southerly winds, which affords anchorage for vessels of any size in 10 to 15 fathoms, mud bottom, about 0.5 mile offshore. The shore from Pine Point to Point Colpoys is rocky and should not be approached closely.

Chart 8160.—Point Colpoys, about 2.2 miles eastward of Pine Point, is low and wooded and is marked by a light. Irregular bottom extends about 0.3 mile to the northward of the point. Shoals extend in the general direction of Rookery Islands from a position about 1.2 miles eastward of the light.

McArthur Reef lies about 3.2 miles eastward of The Eye Opener and 3.5 miles northwestward of Point Colpoys. This reef has 2½ fathoms over it, and is marked off its eastern end by a lighted bell buoy.

Mitchell Point, on the southeastern end of Kupreanof Island, is low, level, and rocky. A broad tapering reef, showing considerable kelp, extends about 2.2 miles southeastward from the point. The extreme outer end of the reef bares; at high water it is usually marked by tide rips. A buoy marks the southwestern entrance of the narrow channel leading to the westward of Level Islands.

Level Islands, heavily wooded, lie about 2.5 miles eastward of Mitchell Point. South of the western island is a small islet surrounded by rocks, and the entire group is surrounded by a shelving ledge and by kelp extending out nearly 0.5 mile. A pinnacle rock, with 3 fathoms over it, marked by a lighted buoy, lies 0.6 mile southeastward of Level Island in the direction of Vichnefski Rock. The passage southwestward and westward of Level Islands is foul.

White Rock is 1 mile northeastward of the east end of Level Islands and can be readily recognized by its white appearance and detached position.

Kah Sheets Bay, northward of Level Islands, is shoal and has many dangers. Three wooded islands lie south of the northern entrance point. Small fishing craft frequently anchor west of the southern island in 1½ fathoms, mud bottom.

Vichnefski Rock, marked by a light, lies on the southeast side of Sumner Strait, about 0.8 mile northward of Point St. John, Zarembo Island. It is a long bare rock, awash at extreme high water. Southeastward of Vichnefski Rock are several ledges which partly bare, and the passage between the rock and **Point St. John** should not be attempted except by small craft with local knowledge.

St. John Harbor, on the northwest side of Zarembo Island eastward of the light on Vichnefski Rock, is sheltered except from northward. **Low Point** and Point St. John lie, respectively, to the northward and southward of the entrance. **Northerly** and **Southerly Islands** are in the outer part of the harbor. Two large rocks are close to the north side of Northerly Island, and rocks which bare and marked by kelp, are just outside of them. Vessels should enter midway between Northerly Island and Low Point.

Anchorage in about 14 fathoms, mud bottom, can be had midway between the middle of Southerly Island and the first bight in the opposite shore of Zarembo Island. Anchorage in 7 fathoms can be had farther in, but the currents are strong.

Small craft can enter St. John Harbor southwestward of Northerly and Southerly Islands, taking care to avoid a rock, awash at half tide, 200 yards southwestward of the south point of Northerly Island, and a similar rock which lies 80 yards southward of Southerly Island. A daybeacon is on the point about a mile eastward of Low Point.

Chart 8201.—Duncan Canal has its entrance 3 miles west of the entrance to Wrangell Narrows. From its head a low marshy valley, sometimes used as a portage, extends to Portage Bay. The soundings in the canal generally are less than 20 fathoms and somewhat irregular.

Chart 8160.—Foremost Rock, a rock that uncovers 12 feet and marked by a daybeacon, is near the eastern end of a reef 0.8 mile long off the entrance to Duncan Canal, nearly on a line joining White Rock and the west point at the entrance to Wrangell Narrows and nearly 1 mile from the point.

Lung Island, wooded, is on the western side of the entrance to Duncan Canal. A small islet, 25 feet high and wooded, lies in midchannel westward of Lung Island; there is a narrow passage on each side of this islet, the western passage being foul.

Baby Island is about 0.4 mile southeastward of the point on the east side of the entrance to Duncan Canal.

Butterworth Island, wooded, is close off the western shore of Woewodski Island and on the eastern side of Duncan Canal, about 2 miles from the entrance. The narrow passage between Butterworth and Woewodski Islands is navigable for small craft at high water, but is not recommended for strangers.

Chart 8201.—Woewodski Island separates the lower part of Duncan Canal from the lower part of Wrangell Narrows, and is separated from Lindenberg Peninsula by Beecher Pass. The island is wooded and mountainous.

Beecher Pass Light (56°34.8′ N., 133°04.4′ W.), 12 feet above the water, is shown from a white-slatted tripod on the northwestern point of the island. In the first bight to the southward of the light are the buildings of the abandoned **Olympic Mine.** A trail leads inland to **Harvey Lake.**

Beecher Pass, 4 miles within the entrance to Duncan Canal, connects the canal with Wrangell Narrows; it is filled with islets and reefs showing much kelp. **Fair Is-**

land lies at the west end of the pass. A reef extends about 700 yards in a northerly direction from the northwest end of Woewodski Island, and rocks lie off the eastern end of Fair Island in the middle of the channel to the southward of Fair Island. Reefs extend about 250 yards off the northern shore of Fair Island, and a rock lies about 250 yards eastward of its eastern point. All known dangers are charted. The pass is used by tugs with tows and extensively by fishermen, hunters, and trappers, and is easily navigated with proper caution. Boats may pass either north or south of Fair Island with safety. A depth of 10 feet can be carried through Beecher Pass to Wrangell Narrows.

To go through Beecher Pass, steer midchannel courses from westward until beyond the east end of **Big Saltery Island,** and then favor the southern shore until almost abeam of No Thorofare Point.

The bay between Keene and Big Saltery Islands (see Chart 8170) is good shelter and used extensively. Anchor in 8 to 13 fathoms, mud bottom. Small craft also anchor near the western end of the pass in the small cove on the north side, north of Fair Island in 2 to 3 fathoms.

Little Duncan Bay, entering the western shore of Duncan Canal opposite Beecher Pass, about 4 miles from the entrance, is shallow but affords protected anchorage for small craft. **Emily Island** is a small, wooded islet on the southern side of the bay. Foul ground extends in a southeasterly direction from the northern point at the entrance.

Grief Islet, on the east side of Duncan Canal northwestward of Beecher Pass, must not be approached closely, as foul ground is found close inshore and southward of it. A rock which bares lies 1.2 miles 340° from the island.

A rock with a depth of ½ fathom over it, 2 miles 320° from the northwest point of Grief Islet, is marked by a buoy close westward.

Castle Islands are a group of small islands, most of them wooded, lying on the southwestern side of Duncan Canal, about 10 miles from the entrance. **Castle River** empties into the bight westward of the islands. The head of the bight is filled with a mud flat, and the entire area westward of Castle Islands is shoal.

Currents.—The flood enters Duncan Canal with a velocity of 1 to 2 knots and runs in the direction of its axis, except at the west entrance of Beecher Pass, through which it passes into Wrangell Narrows, causing a cross-current in this immediate vicinity. The ebb flows in an opposite direction, and the same cross current, with a westerly set, is found at Beecher Pass. The flood current has a westerly set in the vicinity of the rocks lying off the south end of Woewodski Island. Strong tide rips are found at the entrance to the canal.

In 1959 a survey vessel experienced moderate to strong currents in the entrance between Kupreanof and Woewodski Islands, especially near Butterworth Island. Strangers should use caution when navigating this passage. The effect of the current diminishes inside the canal proper, but light to moderate tide rips have been noted in midchannel as far as Indian Point.

Several good anchorages were found in Duncan Canal, usually in depths of 8 to 15 fathoms, sticky mud bottom, good holding ground.

The only commercial activities in the canal are a few crab and shrimping operations, and a small logging camp.

Directions.—Enter Duncan Canal eastward of Lung Island, proceed in midchannel westward of Butterworth Island, and follow midchannel courses. The known dangers are shown on the chart. Caution is needed in navigating it.

Mitkof Island, triangular in shape, is mountainous and wooded at the northern and southern ends, with a low divide in an easterly and westerly direction through the central portion. Wrangell Narrows lies to the westward and Frederick Sound and Dry Strait to the northward and eastward, respectively.

Chart 8160.—Wrangell Narrows to Wrangell.—Point Alexander, the eastern point of the southern entrance to Wrangell Narrows, is marked by **Point Alexander Light (56°30.6′ N., 132°56.9′ W.),** 23 feet above the water, and shown from a white wooden house on a brown skeleton structure on a reef off the point. **Point Howe,** 4.5 miles to the eastward of Point Alexander, presents no special features.

Woodpecker Cove is a small indentation on the northern side of Sumner Strait, close westward of Point Howe. It affords anchorage for small craft with protection from Stikine winds.

Station Island, about 1.7 miles eastward from Point Howe, is small and timbered. The shoreline is rocky with cliffs 15 to 30 feet high.

Blind Slough enters the southern end of Mitkof Island. It has a wooded island at the entrance and another island 2.5 miles inside. The head of the slough divides into several arms. A large stream empties into the eastern arm. From the head of the slough low ground extends to Wrangell Narrows. The slough is too shallow to be of use as an anchorage except for small craft and then local knowledge is desirable.

Baht Harbor, on the north shore of Zarembo Island, about 3.5 miles eastward of Low Point, is a broad, open bight, affording anchorage in southeast winds. The anchorage is in the middle of the bight, in 12 to 15 fathoms, about 0.2 mile offshore. At high water, the navigator should not seek less than 15 fathoms.

Little Baht Harbor, 1 mile westward of Craig Point, affords anchorage for small craft in 7 fathoms, soft bottom, behind a wooded islet and off the mouth of a small creek. There is considerable current at the anchorage, and its use is recommended only in case of emergency.

Craig Point, marked by a daybeacon, is on the northern shore of Zarembo Island, about 2.5 miles eastward of Baht Harbor.

Vank Island is timbered and has two prominent hills. The southern shore is marked by cliffs 40 feet high in places; the northern shore is low and strewn with rocks. A light, 24 feet above the water, is shown from a white wooden house on a square wooden tower on a pier on

Neal Point at the southern end of the island. **Mud Bay** lies to the northwestward of Neal Point. It is deep at the entrance, shoals rapidly, and is not regarded as a favorable anchorage. The bight in the northern end of Vank Island at times is used as a small-craft anchorage.

Two Tree Islet, a small rocky islet off the north end of Vank Island, is marked by a light, 18 feet above the water and shown from a small white house. A 2-fathom spot lies about 1 mile north-northwestward from Two Tree Islet. Passage may be made on either side of Vank Island, but the southern is preferred.

Sokolof Island, northeastward of Vank Island, is timbered. The center is low and is drained by a stream running westward, which empties into a bay that is used as an anchorage by small boats except during westerly winds.

Wilson Islands, two small low rocky islands thickly wooded with spruce, lie at the southern end of Dry Strait near Mitkof Island.

Chart 8201.—Dry Strait, mostly bare at low water, affords passage for small craft at high water between the head of Sumner Strait and the head of Frederick Sound. It is extensively used by fishing boats and boats operating between the towns of Wrangell and Petersburg. The channel requires local knowledge for safe navigation. Boats should attempt the passage only on the upper half of a rising tide. There are no abrupt changes in depth. The water is muddy at all times, and strong currents are experienced in places, 5 knots having been observed at times at Blaquiere Point.

The channel passes close eastward of **Blaquiere Point,** marked by a daybeacon, and to the westward of the small islet 0.9 mile northward of Blaquiere Point. A daybeacon on the west shore, about 3.5 miles northwestward of the islet, marks the north end of the shoal water area through the strait.

Boats should not attempt to pass between **Dry** and **Farm Islands.** A poor channel can be followed at high tide between **Sergief** and Farm Islands.

Kadin Island is wooded. From the southward it appears sharp, but from the east and west directions wedge-shaped. **Rynda, Greys, Hidden,** and **Pocket Islands** lie within Dry Strait. Fivemile Island, marked by a light, is about 1.8 miles northward from the north end of Woronkofski Island and is described with Stikine Strait.

A rock with ¾ fathom over it is 0.5 mile to the eastward of **Liesnoi Island,** a small wooded island to the southward of Kadin Island.

The **Stikine River** has its source in a small lake in British Columbia near latitude 57°10′ N., longitude 128°-00′ W., and is about 200 miles in length. It flows in a southwesterly direction through glaciers and gorges; one of the latter, very narrow and about 30 miles long, is known as the Grand Canon. The river freezes in the winter, and with the spring freshets the current builds up great force. The river is usually navigable from about May 1 to October 15. The highest water is generally in July. Vessels drawing 3 feet and less navigate the river to Telegraph Creek, British Columbia, about 165 miles above the mouth.

Stikine River empties by two mouths: One, the north channel, following the mainland westward, enters the head of Frederick Sound; the other follows the mainland southward and forms the only navigable entrance to the river. The north channel can be navigated only by small craft at high water. The southern entrance has a least depth of about 2 feet at mean lower low water. The mean range of tide is about 11½ feet and the diurnal range is about 14 feet. The channel is from 0.2 to 0.5 mile wide. Tidal effects have been noted for a distance of 20 miles above the mouth.

The Federal project provides for snagging of the Stikine River from its mouth to the Canadian border, a distance of approximately 26 miles above **Gerard Point.** In June 1951, the channel was in good condition.

No permanent directions can be given since the channel across the mud flats at the mouth of the river changes with every freshet. Strangers can obtain directions from the masters of the river boats at Wrangell. The channels of the south arm of the Stikine River are followed by experienced boatmen by the appearance of the water. There is a strong southerly current in the channel. The water appears to boil in the deeper parts, while over the shoals it runs smoothly and evenly.

Chart 8170.—Wrangell Narrows extends in a general northerly direction for 21 miles from near the east end of Sumner Strait to the eastern part of Frederick Sound. The channel is narrow and intricate in places, between dangerous ledges and flats, and the tidal currents are strong. It is marked by an extensive system of lights, lighted ranges, day beacons, and buoys which, with the aid of the chart, renders the navigation of the narrows fairly easy for small craft, even without local knowledge. Vessels of more than 10 feet draft, however, are advised not to attempt to go through without a pilot. A local pilot can sometimes be obtained at Ketchikan, Wrangell, or Petersburg. It is safest to enter either end with a flood tide. The deepest draft taken by commercial vessels through Wrangell Narrows in 1959 was 20 feet. The commodities moved through the narrows included rafted logs, lumber products, petroleum products, fish, and fish products, provisions and general cargo.

Ice.—Occasionally a few stray pieces of ice from Le Conte Bay work into Wrangell Narrows as far as Green Point. The size of the pieces are sufficient to make them dangerous to navigation.

Channel.—The Federal project for Wrangell Narrows provides for a channel 24 feet deep through the narrows and 27 feet through Petersburg Bar. In August 1952, the controlling depth was 20 feet. Some of the cuts have a tendency to fill and considerable dredging has been required. Once or twice each year exceptionally low tides occur, at which time the water level may fall as much as 4 feet below chart datum.

Vessels too large to make the passage through Wrangell Narrows safely, continue westward through Sumner

Strait, round Cape Decision, and go northward through Chatham Strait, or westward to sea by way of Cape Ommaney. Smaller vessels regularly using Wrangell Narrows sometimes use the longer passage to their advantage when not favored by suitable conditions of tide or daylight in the narrows.

Directions.—Specific courses for Wrangell Narrows would be of little help and could be confusing. The navigator should pay close attention to the chart as the narrows are well marked with aids to navigation which should be closely followed.

In some cases with twin screw vessels, the engines are reversed in order to help make the sharp turns. Inquiry of local pilots showed that they did not use courses in the narrows on account of strong currents and sharp turns. In foggy weather vessels come to anchor at either end of the narrows and wait until the fog clears away. Vessels of over 10 feet in draft are advised to take a pilot.

On the course between **Deception Point** and Point Lockwood, there is a strong tendency to be set to the westward with a flood current. At Point Lockwood Rock Light, a sharp turn is necessary and usually the time required to get on course makes it necessary to immediately change to the next course. Commercial vessels make this turn by going hard left and hard right without steadying.

On the course between Burnt Island Reef and South Ledge, there is a tendency to be set to westward on the flood.

On the course out of the north end of the narrows during the flood, there was found to be a strong westerly set especially in the vicinity of Prolewy Rock.

Low powered vessels usually enter the narrows on the last of the flood and carry a favorable current all the way through. The currents meet about 8 miles from the northerly entrance and 12 miles from the southerly entrance.

Currents.—The currents enter Wrangell Narrows from both ends on the flood and meet a little south of Green Point. At the north end of the Narrows during the turn of the tide on the last of the flood and the first of the ebb, there is an unexpected current of approximately 2 knots setting northwest directly across the channel. The velocity of the current in the Narrows varies from place to place. Off Petersburg the velocity of the current is 3.5 knots. The strongest currents occur off Turn Point, and off Spike Rock and South Ledge Light. The velocity of the current at times of strength at these points is between 4 and 5 knots. During spring and tropic tides, velocities of 6 to 7 knots may occur.

The Tidal Current Tables include daily predictions of the times of slack water and the times and velocities of strength of current for Wrangell Narrows (off Petersburg), together with differences for obtaining similar predictions for a number of other places in the narrows.

Federal regulations governing navigation in Wrangell Narrows are given in **§ 207.800,** Chapter 2.

Midway Rock is about 1.2 miles from the southern entrance to the narrows and 400 yards from the eastern shore. It is low and marked by a light.

Anchorage with protection from northerly and northeasterly winds can be had near the western shore of the southern end of the Narrows westward of Midway Rock, in 6 to 12 fathoms, sticky bottom.

Point Lockwood, 1.6 miles northward of Midway Rock, is marked by a light. A ledge is close to the western shore nearly 0.5 mile above the point. A dangerous flat which bares extends 300 yards off the mouth of a stream on the eastern shore opposite the ledge.

Point Lockwood Rock, with ¾ fathom over it, is 200 yards from shore and is marked on its northeasterly side by a light on the highest point of the rock. A rock with 2¾ fathoms over it, but no kelp, is nearly midway between Point Lockwood Rock and the southernmost **Battery Islets** and is marked by a light. The main channel leads westward of Battery Islets and has a clear width of 100 yards with rocks on both sides. Two lighted buoys mark the edge of the shoal water on the west side of the channel and on the eastern side of the channel a light marks the northwestern edge of the reef off the northernmost islet. The tow channel used by small craft and tows runs eastward of Battery Islets and is marked by buoys.

Boulder Point, on the west side of the narrows about 0.4 mile northwestward of Battery Islands, is marked by a light.

No Thorofare Point, on the west side of the channel 5 miles above Point Alexander, is the south point of the eastern entrance of Beecher Pass. Beecher Pass has been described with Duncan Canal earlier in the chapter.

Spike Rock, about 500 yards southeastward of Keene Island, is marked by a lighted buoy. The dredged channel which leads eastward of the rock is marked by lights on the eastern edge and by a lighted range.

Burnt Island, small and wooded, is on the west side of the channel about 6 miles above Point Alexander. A light marks the end of the rock ledge extending southward from Burnt Island. The eastern edge of the reef off the north side of the island is marked by a daybeacon. **Burnt Island Reef** lies on the east side of the channel, northeastward of Burnt Island, and is marked by a light.

South Ledge, a reef marked by kelp, lies on the eastern side of the channel about 7 miles above Point Alexander. The eastern edge of the channel northwestward of the ledge is marked by a light. Shoaling has been reported in the eastern half of the channel close southward of the light. The western edge of the channel is also marked by a light.

North Ledge is a bare reef marked by a light on the eastern side of the channel 0.5 mile northward of South Ledge. **North Point** is on the western side of the narrows between North and South Ledges. A reef extending off the point is marked by a light.

Bush Top Island, northward of North Ledge, is to the westward of the channel. The southeastern edge of the reef surrounding the island is marked by a light.

Spruce Point, low and wooded, is on the eastern side of the channel opposite Bush Top Island.

Colorado Reef is on the western side of the narrows opposite **Anchor Point,** about 8.5 miles above Point Alexander; the reef bares. A mud flat fills the large bight between Anchor Point and **Blind Point.** A narrow channel, called **Blind Slough,** is navigable for small craft at

high tide and leads across this mud flat to the mouth of **Blind River.**

The winding channel between Anchor Point and **Rock Point** is well marked by lights and buoys.

Vexation Point is the eastern point of **Woody Island,** about 9.5 miles north of Point Alexander. The edge of the reef that makes off to the northeastward of the point is marked by a light. The tow channel passes to the west of the main channel between Anchor Point and Woody Island.

Danger Point Ledge is a reef that bares, lying off **Danger Point** on the eastern side of the channel opposite Vexation Point. It is marked by a light.

Green Rocks is a bare ledge. The north end is marked by a daybeacon and the south end by a light. The main channel passes eastward of Green Rocks.

North Flat, a wide flat lying on the eastern side of the channel, southeastward of Green Point, bares. **South Flat** is a smaller flat which bares, on the opposite side of the channel. The main ship channel between the flats is marked by lights and a lighted buoy.

From the light off Green Point the channel widens to nearly the whole width of the narrows, and the water deepens to 15 to 20 fathoms.

Mountain Point is marked by a light 43 feet above the water. There is a small wharf on the eastern side of the narrows opposite Mountain Point. A road extends northward along the eastern shore of the narrows from this wharf to Petersburg.

Scow Bay is about 2 miles below Petersburg. An old cannery about 0.6 mile southward of the bay has been converted to a restaurant and lodge. Only the ruins of the old cannery wharf remain. A small-craft float landing is maintained.

At **Blunt Point** the channel narrows and boulder patches, marked by kelp, are on either side. A light marks the edge of the reef on the east side of the channel off Blunt Point. The light is most brilliant on the bearing 339°, diminishing around the remainder of the horizon. A seaplane facility and ramp is on the northern side of the point.

At **Turn Point** a shoal extends to northwestward halfway across the narrows. Frequent dredging is necessary to keep the channel open at this point. The dredged channel is marked by two lighted ranges, lighted buoys, and three lights. The tow channel passes eastward of the three lights marking the eastern edge of the bend in the main channel off Turn Point.

Petersburg Creek, which empties into the narrows from the western side opposite Turn Point, is navigable for small craft at high tide.

Bayou Point is the north point at the entrance to Petersburg Creek. There is a sawmill here. A road extends along the shore behind the point.

Prolewy Rocks, off the western point just inside the northern entrance to Wrangell Narrows, are marked by a daybeacon. The tow channel passes westward of the main channel and eastward of the daybeacon. A lighted bell buoy marks the northern entrance to Wrangell Narrows.

Petersburg (pop. 1,502; P.O.), on Mitkof Island on the east side of Wrangell Narrows one mile inside the north entrance, is a fishing center. The town has two cold storage plants and five canneries, also a sawmill. Petersburg is the home port for some 200 fishing boats. The deepest draft of commercial vessels calling at the port in 1959 was 20 feet. Commodities handled at the port included fish and fish products, logs, and lumber products, machinery, petroleum, and petroleum products, provisions, and general cargo.

Channels.—A Federal project provides for a depth of 24 feet in the approaches to the existing wharves; a small-craft basin 11 to 15 feet in depth; and a short channel 8 feet deep to the south side of the Forest Service float. In June 1959, project depths were available.

Anchorages.—Anchorage is prohibited in Wrangell Narrows in the main channel and in the tow channel; see **§ 207.800,** Chapter 2. The landlocked harbor affords excellent protection for small craft, but anchorage space is limited for large vessels.

Dangers.—All known dangers are charted and most are marked. There are two shoals, each marked by heavy kelp, 100 and 240 feet north of the north end of Sheldon Wharf.

Tides.—The mean range of tide is 13.4 feet and the diurnal range is 15.7 feet. Daily **tidal current** predictions for Wrangell Narrows, off Petersburg, are given in the Tidal Current Tables.

Quarantine.—The U.S. Public Health Service maintains an outpatient office in Petersburg.

Customs.—Petersburg is a port of entry.

Harbor Regulations.—A speed limit of 7 knots is prescribed for Wrangell Narrows from a point about a mile south of Blunt Point to off the eastern end of Petersburg Harbor; see **§ 207.800,** Chapter 2.

Wharves.—The Pacific American Fisheries wharf has an outer face 131 feet long. The Public Dock, at the Petersburg Cold Storage plant, is 173 feet long at the face. The Kayler Dahl Fish Company wharf is 210 feet long. These wharves have least depths of 24 feet alongside. The area to the south of the main Pacific American Fisheries wharf, between it and the Public Dock, has depths ranging from 18 feet along a line between the outer faces of the wharves to 6 feet along the inner wharf face which is 195 feet long. Floats for Government launches are on each side of the approach to the Kayler Dahl wharf. Small craft floats are maintained between the Public Dock and Kayler Dahl wharf. The City wharf and plane float, southwest of Kayler Dahl wharf, has 60 feet along its face; it and the float at its northern end have controlling depths of 8 feet alongside.

The Union Oil Company wharf face is 70 feet long with a least depth of 14 feet alongside. The Standard Oil Company wharf, 160 feet long, has a least depth alongside of 20 feet. South of the latter wharf is the Sheldon wharf, 60 feet long with 14 feet in depth along the face.

Supplies.—Several stores have provisions, fishing supplies, and some marine hardware. Fresh water is available during the summer at all the wharves. Diesel oil, gasoline, and lubricating oils are obtainable at the oil company wharves.

Repairs.—There are several machine shops where repairs to machinery of vessels can be made. Information about marine railways in Alaska is given in Chapter 3.

Communications.—Regular steamship lines operate between Seattle and all the major ports in Southeast and Southwest Alaska carrying freight. The Alaska Steamship Company ships call weekly the year-round. There is weekly communication by mail boat with isolated areas as far west as the east coast of Baranof Island. Air service twice daily, north and south, operates the year-round between Ketchikan, Wrangell, and Juneau. Arrangements for flight to many other areas can be made at Petersburg.

The Alaska Communication System maintains radiotelephone connections with the States and other ports of Alaska.

8. FREDERICK SOUND

Chart 8002.—Frederick Sound has its entrance from Chatham Strait between Kingsmill Point and Point Gardner and extends northeastward to The Brothers and Cape Fanshaw, at the entrance to Stephens Passage, and eastward to Dry Strait, a high-water boat passage connecting it with the eastern end of Sumner Strait. The sound is open and clear of obstructions, and there are few offshore dangers to navigation. The shores and islands of the sound are all high.

Ice.—Glacial ice in small quantities is generally present in the eastern arm of Frederick Sound, coming from Le Conte Bay, where at times there are enormous quantities. It generally follows the north shore as far as the entrance to Thomas Bay. With some conditions of wind and weather, ice may be expected as far as Sukoi Islands. It is sometimes seen at Cape Strait and at Turnabout Island. Occasionally a few stray pieces work into Wrangell Narrows as far as Green Point. The size of the pieces is sufficient to make them dangerous.

Currents.—The tital current on the flood enters Frederick Sound from Chatham Strait; it sets northward into Stephens Passage and through the eastern arm. The ebb sets in the reverse direction.

Current observations made between Cape Fanshaw and Cape Strait indicate that the ebb or westerly current is considerably stronger than the flood. In the vicinity of Cape Strait the ebb velocity is about 1.5 to 2 knots and it is probable that the current floods only with the largest tides of the month.

Chart 8201.—Camp Island, Pocket Island, and **Hidden Island** are wooded islands on the flats northward of Dry Strait.

Ideal Cove has its entrance on the south side of Frederick Sound, 14 miles eastward of Wrangell Narrows and 1.2 miles southward of Coney Island. It furnishes good anchorage for small vessels in 7 fathoms. Two well-defined rocks awash, lie close to the east point of the entrance, while a large rock, bare except at the highest tides, is on the west side at the entrance. **Cosmos Point,** the east point of the entrance, is wooded.

Coney Island is steep-to; the edge of Stikine River flat lies about 0.5 mile eastward of it, and reefs extend 0.3 mile northward from the point 0.8 mile southward of the island.

Le Conte Bay, on the north side of the head of Frederick Sound, at times is inaccessible because of floating ice. Anchorage for small craft is obtainable in **Thunder Cove** in 7 fathoms and out of the path of the ice flow from the head of the bay. The great depths in the main bay prevent anchoring. The narrow entrance between the north end of Stikine River flats and the shore has depths of 2½ fathoms.

Large icebergs from **Le Conte Glacier** are a menace to navigation from Camp Island to **Frederick Point.**

The southwestern shore of Frederick Sound, from Wrangell Narrows to Cape Strait is bold and can be safely approached as close as 0.5 mile. A ledge, that uncovers about 8 feet, lies about 0.3 mile from the head of the bight, about 3 miles northward of Prolewy Point, the northwestern point of the entrance to Wrangell Narrows.

The **McDonald Islands** are two small islands about 3.8 miles eastward of the entrance to Wrangell Narrows. The eastern island, 228 feet high, is the larger.

Brown Cove, on the northeast side of the strait, northeastward of the entrance to Wrangell Narrows, furnishes indifferent anchorage in 11 to 12 fathoms at the entrance. The head of the cove bares at low water.

Sukoi Islets are two wooded islands, with a smaller one between, lying about 3.8 miles northward from the entrance to Wrangell Narrows and about 1 mile off the westerly shore of Frederick Sound. The westernmost and largest island is about 330 feet high. The easternmost island is about 120 feet high, and the middle island is low. A light, 24 feet above the water on the west side of the westernmost islet, is shown from a small white wooden house on skeleton tower on a concrete pier. The usual channel is westward of the islets.

Chart 8210.—Point Agassiz is low and wooded. An extensive marsh flat extends about 2 miles to the northward.

Beacon Point, 3 miles northward of Sukoi Islets, is marked by a daybeacon.

Cape Strait is marked by **Cape Strait Light (56°59.9′ N., 133°05.5′ W.),** 45 feet above the water, shown from a small white house on a skeleton structure.

About 1.4 miles southeastward of Cape Strait is a small valley and bight. A reef, on which there is a wooded islet, extends 0.2 mile off the point on the east side of the bight.

Thomas Bay is the large estuary on the north side of Frederick Sound between Wood Point and Point Vandeput, about 10 miles northward of Wrangell Narrows and 22 miles east of Cape Fanshaw. The entrance is marked by buoys. Anchorage can be had off the southern shore inside Wood Point. Very good small craft anchorages can be had in either of two small coves on the eastern shore of Ruth Island in depths of 3 to 10 fathoms, soft bottom.

Thomas Bay, from the bar to **Baird Glacier,** at its head, is about 10 miles long. The moraine of Baird Glacier now extends to about abreast **Elephants Head.** On the

southeastern side is an arm extending southward to the moraine of the **Patterson Glacier.** These glaciers do not discharge ice into the bay.

Wood Point, the eastern point of the entrance to Thomas Bay, is low and wooded. A kelp-covered reef, largely bare, extends 0.6 mile off Wood Point. Buoys mark the western extremity of the reef.

Point Vandeput is the southern extremity of a low neck of land extending 2.5 miles southward from shore on the northwestern side of the entrance to the bay. A detached clump of trees is at the end of the wooded portion of the point. A narrow channel, with a depth of 4 fathoms, separates the reef southward of the point from a kelp-covered bar which extends 0.8 mile farther in a southeasterly direction. A buoy marks the southeastern end of the bar.

The entrance channel between the bar and the reef westward of Wood Point has depths of 4¾ to 7 fathoms.

The **tidal currents** have a velocity of about 3 knots over the bar at the entrance to Thomas Bay, and swirls occur at times from the shoal spot in the middle of the channel to Point Vandeput. In the channel eastward of the shoal spot, the swirls are little felt.

Spurt Point, in Thomas Bay, about 3.5 miles eastward of Point Vandeput, is steep and wooded.

Bock Bight, lying about 1.8 miles eastward of Wood Point, is a narrow, deep bight, the entrance to which is bare nearly 2 hours before low water, forming a dam with deep water inside that overflows with great force except at slack water.

Ruth Island is the large island on the west side of the entrance to the southeast arm of the bay; close to its north end are a small islet and some low-water rocks. The northwest entrance to the passage westward of Ruth Island is shoal but may be used by small vessels.

Spray Island lies on the eastern side of the southeast arm eastward of the center of Ruth Island.

Anchorage for small boats may be had in 5 fathoms off the northwestern entrance of the passage between Ruth Island and the mainland. Anchorage for small vessels may be had in the bight eastward of Spray Island in 18 fathoms. The anchorage is close to the beach which is steep-to. Anchorage for larger vessels may be had in 11 fathoms, mud bottom, off the bight at the southeast end of Ruth Island.

Scenery Cove, in the northern part of Thomas Bay, does not afford anchorage except for small craft. Large vessels can anchor at the entrance to the cove in 7 to 15 fathoms.

Farragut Bay is the large indentation on the north side of Frederick Sound between Grand Point and Bay Point, about 20 miles northwestward of the north entrance to Wrangell Narrows and 12 miles eastward of Cape Fanshaw.

Grand Point Light (57°05.5′ N., 133°11.1′ W.), 12 feet above the water and shown from a small white house, marks the eastern point at the entrance to Farragut Bay, which is low and marshy at its end. **Bay Point,** the western point at the entrance, is bold and wooded.

Farragut Bay has two arms. The western arm is smaller and its entrance is obstructed near midchannel by a rock awash, and by a shoal which extends from the western shore. Vessels may enter by favoring the eastern shore. The eastern arm expands into a large bay known as **Francis Anchorage.** Small vessels may find anchorage in the northwestern part of this arm in 8 to 15 fathoms, soft bottom, and also on the eastern side of the arm just north of the projecting point. Larger vessels may anchor off this point in 15 to 30 fathoms. There are extensive tidal flats at the head of Farragut Bay; tidal currents have little velocity in the bay.

Read Island is on the eastern side of Farragut Bay, with a very narrow passage, and depths of 4½ fathoms between it and Grand Point, which may be used by small craft.

Flock Rock is a small rocky islet in the middle of the passage northward of Read Island. Sunken rocks are reported to lie between Flock Rock and the shore.

A small vessel can make a temporary fair-weather anchorage between Grand Point and the south end of Read Island in 5 to 6 fathoms, hard bottom. The best passage to Francis Anchorage is westward of Read Island, and between Flock Rock and Read Island, about 0.2 mile off the latter. The chart is a sufficient guide.

Portage Bay, on the south side of Frederick Sound 7 miles westward of Cape Strait, is a secure anchorage but its entrance is narrow. The tidal currents in the entrance have considerable velocity at spring tides. Ice forms in the bay during extreme cold weather. **Portage Islets,** two in number, are in Frederick Sound, about 0.8 mile westward of the entrance and 0.4 mile offshore.

The entrance channel which has a controlling depth of 3½ fathoms, is constricted by shoals to a width of 150 yards. Shoals make out from the shores of the bay and also from the head to 0.8 mile northward of **Stop Island. Harrington Rock,** 3 feet high, lies about 0.2 mile northwestward of Stop Island.

Portage Bay Light (57°00.3′ N., 133°19.3′ W.), 16 feet above the water, is shown from a small white house on the end of **East Point. West Point** is marked by a daybeacon.

The best time to enter Portage Bay is at high-water slack. As a range for entering, small boats have used the grass line of East Point, Hook Point, and a small hill in the background. Round East Point at a distance of about 200 yards and follow midchannel courses.

Anchor in 4 to 6 fathoms from 1 to 1.5 miles north-northwestward of Stop Island. The water shoals gradually toward the shore; there are no dangers outside the 3-fathom curve.

Chart 8201.—From Farragut Bay to Cape Fanshaw, the shore should not be approached closer than 0.5 mile. The coast is bold and heavily wooded. **Point Highland,** 4.2 miles eastward of Cape Fanshaw, is steep-to and wooded but is not prominent.

Cape Fanshaw, at the junction of Stephens Passage and Frederick Sound, is a long, low, wooded point terminating in a moderately long sand spit, with a large boulder at the extreme end, and deep water within 0.2 mile of the

point. **Cape Fanshaw Light (57°11.1′ N., 133°34.3′ W.)**, 41 feet above the water, is shown from a small white house on a skeleton structure on the point of the cape.

Turnabout Island, about 13.5 miles westward of Cape Fanshaw is high and wooded. The shores are fairly bold except at the south end. A temporary anchorage for small craft is in the cove on the northwest side of the island. A reef, 0.5 mile southwestward of Turnabout Island, shows as two rocks about 10 feet high, at high water; but at half-tide the reef shows for 300 yards southward and on the line of the bare rocks. A clear channel 1.5 miles wide, between these rocks and Pinta Rocks, may be safely used in the daytime and with clear weather. A light, 23 feet above the water, is shown from a small white house on an islet north of Turnabout Island.

Pinta Rocks are two patches of rocks lying about 2.2 miles southward from Turnabout Island and about 1 mile off the main shore. The eastern patch, covered at about half tide, is marked on its eastern end by a buoy. The western one is 8 feet high and is marked by a light, 30 feet above water, shown from a small white house on a tower on the westerly rock. Both patches are surrounded by extensive kelp beds.

The passage south of Pinta Rocks is used extensively by small craft, and is especially valuable when going against the current, since the currents here are much weaker than those north of the rocks.

Cape Bendel, a rounding wooded point, lies about 4 miles to the southward of Turnabout Island. In rounding Cape Bendel, keep well offshore to avoid a rock bare at half tide, marked by kelp, which is reported to lie about 0.5 mile off the cape in the direction of the westernmost Pinta Rocks.

Keku Strait, northern part.—Keku Strait is divided into three parts: a southern bay, a northern bay, and a narrow intricate passage about 18 miles long known as Rocky Pass, which connects the two bays. The southern bay and Rocky Pass are described in Chapter 7. Rocky Pass is shown in detail on Chart 8272. The following description covers the northern bay.

The northern bay of Keku Strait is about 13 miles long from the entrance to Point Camden where the bay branches, the western branch forming Port Camden and the eastern branch forming Rocky Pass. The northeastern shore of the bay is formed by **Kupreanof Island** and the southwestern shore by **Kuiu Island.** The entrance from Frederick Sound lies between Point Macartney and Cornwallis Point.

Point Macartney, the northeast point at the entrance from Frederick Sound, 2.5 miles south of Cape Bendel, is a long, low, wooded point, terminating in an abrupt wooded islet with two bare masses of rock between, all connected by a rocky platform at low water. **Point Macartney Light (57°01.5′ N., 134°03.4′ W.)**, 25 feet above the water, is shown from a small white house on a small islet off the point.

Beginning 2 miles southward of Point Macartney and extending 4.5 miles in a southeasterly direction is a chain of reefs and wooded islets lying 1 mile from the northeast shore and parallel to it; the northwesternmost reef is marked by a lighted bell buoy. On the northeastern side of this chain of reefs and wooded islets, between them and the shore of Kupreanof Island, is a narrow channel leading southeastward to **Kake Harbor** and the village of Kake. About a mile southward of Kake, and 3 miles southeastward of the northwesternmost reef, is **Grave Island,** a small scrubby island, which is marked on its northeast side by **Kake Harbor Light (56°57.6′ N., 133° 57.0′ W.)**, 16 feet above the water and shown from a small white house. Anchorage may be found in Kake Harbor in 15 fathoms, soft mud, midway between the village and Grave Island.

Kake (pop. 455; P.O.) is a native village with a store and an Alaska Public Health Center with nurse, about 5 miles southeastward of Point Macartney. Reefs, marked by buoys on their outer edge, extend about 600 yards off the village shore, and extensive flats, also marked by a buoy, extend about a mile southeastward of the village. A dock and seaplane landing have been built out from the end of the old breakwater at the southeast end of the village. The dock is used throughout the year, principally by fishing boats, cannery tenders, and small freight vessels carrying general merchandise. A lighted buoy marks the approach to the dock. Air transportation to Petersburg is scheduled daily in summer and three times a week during the winter. Radio service is maintained by the Alaska Communication System.

A salmon cannery wharf and a fuel wharf are a mile southeastward of Kake. In June 1960, the cannery wharf had a 121-foot face with depths of 22 feet alongside; fresh water was available on the wharf at all times. The fuel wharf close southward had depths of 24 feet at the face, and marine supplies were available in limited quantities. There is a crab cannery about 0.5 mile southeastward of the salmon cannery.

The best approach to Kake Harbor is from the northwest on a southeasterly course from between **Point White** and the lighted bell buoy marking the northwestern end of the barrier reef. If bound for the salmon cannery or fuel wharves, pass southwestward of the buoys marking the reefs off the village and the flats southeastward of it; and when clear and southward of the southeasternmost buoy, head up for either pier on any course northward of **090°**, but not allowing the bearing on the fuel wharf to close northward of **040°**. A landing on either side can be made at the cannery wharf.

Small craft coming from the westward usually pass 100 yards off the northernmost Keku Islet and head for the light on Grave Island, course **088°**, until within 0.5 mile of it, and then pass northward of the light.

Keku Islets, on the southwest side of Keku Strait, comprise a group of wooded islands, with outlying reefs, between which there are no practicable channels. There are other reefs on the southwest side, but they have portions showing above water and are easily avoided in daytime.

Between Keku Islets and the reefs on the northeast side is a channel 2 miles wide and 8 miles long to Point Hamilton, with depths varying from 7½ to 50 fathoms. South-

ward of Eva Island the channel is about 1 mile wide, between Point Hamilton and Hound Island, and leads between kelp-marked rocks and shoals on both sides.

Eva Island, about 8 miles southeast of Point Macartney, is wooded and marks the turn of the channel when bound for Hamilton Bay or Port Camden. Off its western end is a bare rock.

Point Hamilton, about 0.8 mile southeastward of Eva Island, marks the entrance to Hamilton Bay. A mound-shaped islet is connected at low water with the point.

Hamilton Bay, on the northeast side of Point Hamilton, is a secure anchorage for vessels of any size. Its entrance is clear in midchannel. There are extensive bare flats at its head. Two large streams enter near the head.

The islands on the southwest side of the channel, from abreast Eva Island to the middle of Hound Island, are fringed with kelp to a distance of about 0.4 mile.

Hound Island lies about 2 miles southward of Eva Island. It is 1.5 miles long, low, and wooded, with outlying rocks at either end; on its northern side are extensive kelp patches. A rock, with 2¾ fathoms over it and marked by kelp, lies nearly 1.2 miles southwestward of the southeast end of Hound Island. A rock, which bares 2 feet, lies 1.2 miles southward of the island.

Pup Island, about 2.8 miles south-southeastward of Hound Island, is small, steep, and wooded, and marks **Point Camden,** the eastern point at the entrance to Port Camden.

Port Camden, the entrance to which is on the west side of Pup Island and 15 miles from Point Macartney, is an inlet 13 miles long and 1.5 miles wide for a distance of 5 miles from its entrance. At this point are several islands, the most prominent of which, and lying in midchannel, is **Cam Island.** From these islands the inlet contracts gradually to its head, from which is a portage to Bay of Pillars. From the entrance to Cam Island there is 26 to 35 fathoms; above Cam Island there is 8 to 27 fathoms, decreasing to 4 to 8 fathoms 2 miles from its head.

Salt Point Light (56°50.8′ N., 133°51.8′ W.), 13 feet above the water, and shown from a small white house on the southwesterly end of the point, marks the northern approach to Rocky Pass.

Rocky Pass, extending eastward from Point Camden and connecting with the southern bay of Keku Strait, is a high-water passage for small craft. See description in Chapter 7.

Tidal currents enter the northwestern part of Keku Strait and Port Camden from Frederick Sound. The velocity in the open strait is reported to be 1.2 knots.

Chart 8214.—Saginaw Bay indents the northern shore of Kuiu Island for about 7 miles in a southeasterly direction. **Cornwallis Point,** the northern point at the entrance is low and wooded. **Cornwallis Point Light (56°56.0′ N., 134°16.2′ W.),** 34 feet above the water, shown from a small white house on the southwestern part of the point, marks the entrance to the bay.

Caution.—Vessels should proceed with caution in entering since the bottom is very irregular.

Sachem Island, small and wooded, lies in midchannel, 3 miles from Cornwallis Point. A rock awash lies about 0.6 mile northwestward of Sachem Island. Otherwise the bay is clear until approaching the head, where there are numerous islands with surrounding ledges.

Halleck Harbor, on the northeastern side of Saginaw Bay about 1.5 miles southeastward of Cornwallis Point, is the best anchorage in Saginaw Bay, but is open westward, and the bottom is generally hard and in places uneven. It is readily distinguished by high white bluffs on its northeastern side. At the foot of these bluffs are some Indian houses and graves. The best channel entering is 0.5 mile wide between the 3-fathom rock in the entrance, and the northwest point. The bight at the northwest end of the harbor dries. Anchorage can be had in the middle of the harbor in 8 to 12 fathoms.

The ruins of a cannery wharf are in the cove on the eastern side of Saginaw Bay, about 3 miles southeastward of Halleck Harbor and northward of a high island which lies close to the northern shore.

Security Bay, about 3.5 miles southwestward of Cornwallis Point, is a secure anchorage. The entrance and bay are obstructed by numerous islands and ledges, and it should be entered with caution; the dangers are shown on the chart.

Roadstead Island lies in the middle at the entrance, from which a chain of three small islands, **Flat, Cedar,** and **Harbor Islands,** extends about 0.7 mile in a southeasterly direction. The usual entrance to the bay is between Roadstead Island and Paralysis Point. It is marked by **Security Bay Light (56°52.4′ N., 134°22.3′ W.),** 32 feet above the water, shown from a small house on a skeleton tower, on the southwestern end of a ledge extending from the north end of Roadstead Island.

Bibb Shoal, usually showing kelp, is an extensive shoal with ½ fathom over it, on the west side of the entrance to Security Bay, northward of **Paralysis Point.**

Christmas Island is the largest of several small islands on the south side of Security Bay at its entrance; the island is bluff. Between Christmas Island and Cedar Island, the channel is 0.2 mile wide.

Cleft Island, in the middle of Security Bay, about 1 mile southeastward of Christmas Island, is about 0.6 mile long and has a deep notch in its western end. At its southeastern end are some bare rocks. A narrow islet, about 0.3 mile long, lies close to the northeastern side of Cleft Island.

Retaliation Point, about 0.4 mile northward of Cleft Island, is bluff, steep-to, and wooded. **Cedar Bight** is east of Cleft Island. Its entrance, between Cleft Island and Retaliation Point is obstructed by a ledge bare at lowest tides and surrounded by kelp. The southeastern part of the bight is shoal and rocky; otherwise the depths are 4 to 6 fathoms, rocky bottom.

Indian Rock is a few feet above high water. A rock awash is 300 yards northward of Indian Rock.

Stewart Rock with ½ fathom over it and usually showing kelp at slack water, is 0.2 mile eastward of Indian Rock, in line between it and a shallow bight in Cleft Island. The usual channel lies between Indian Rock and

Stewart Rock. The area between Stewart Rock and Cleft Island is foul.

The best anchorage in Security Bay is about 0.5 mile southeastward of Cleft Island in 9 to 11 fathoms, midway between the large island on the northeastern side and a wooded islet and some bare rocks near the southwestern side. Anchorage can also be had between the west end of Cleft Island and Harbor Island, in 11 to 16 fathoms, clear of the 1¼-fathom rock 0.2 mile southeastward of Harbor Island. The head of the bay is foul with several reefs, some of which cover at high water.

Band Cove is just east of **Hourigan Point** and west of Bibb Shoal, at the entrance to Security Bay. A small vessel can anchor in the entrance in about 6 fathoms, but the cove is not clear and is open from the northwest to southwest; with Security and Saginaw Bays available, its use is not recommended as an anchorage.

Chart 8201.—This section covers the northwest shore of Frederick Sound from Pybus Bay to Chatham Strait. Anchorage can be had in Surprise Harbor, Herring Bay, or Chapin Bay. Small vessels can find secure anchorage in Murder Cove.

The Brothers, a number of large and small wooded islands, are about 2.5 miles off the western shore at the junction of Frederick Sound and Stephens Passage.

Secure anchorage for small craft can be found in the narrow passage lying close westward of the **West Brother** and between it and the small islet surrounded by reefs lying close westward. The entrance is from southward, passing close along the west shore of the West Brother. The northern approach is foul.

Chart 8218.—Round Rock, 40 feet high and bare, about 2.6 miles southwestward from West Brother Island is marked by **Round Rock Light (57°15.6′ N., 133°56.1′ W.),** 49 feet above water and shown from a small white house. There is a clear channel about 2 miles wide between Round Rock and the northern shore, but the bottom is irregular, the soundings ranging from 10 to 40 fathoms. The water is much deeper eastward of Round Rock and between it and The Brothers.

Pybus Bay is located on the northwest side of Frederick Sound, westward of its junction with Stephens Passage and 5.5 miles westward of The Brothers. It is divided into two arms by a long point from which three groups of islands, rocks, and reefs extend in a southerly direction. The best anchorage in the bay is in Cannery Cove.

Point Pybus, the north point at the entrance to Pybus Bay, is low and wooded. A group of rocks extend 0.6 mile southward from the point.

San Juan Islands, low, wooded, and surrounded by foul ground, lie about 0.8 mile southwestward of Point Pybus. A rock with ½ fathom over it is 0.4 mile southward of the southernmost and largest island, and dangerous rocks lie 0.2 mile westward of the western point of this island.

Southwest Islands are a narrow chain of four wooded islands lying parallel with the western shore of the bay, about 1.5 miles southwestward of San Juan Islands. Foul ground extends about 0.5 mile southward of **Elliott Island,** the largest of the group, and two rocks which uncover 11 and 14 feet, respectively, are 0.3 mile north-northwestward of the northernmost island of the group. Two dangerous rocks, bare at half tide, are about 0.2 and 0.3 mile westward of **Long Island,** the middle island of the group.

Grave Island, steep-to, and wooded, is on the western side of West Channel, about 0.7 mile westward of the northern extremity of Elliott Island, and is a prominent landmark for this channel. Bare rocks are 0.2 mile northward of the island and about 0.8 mile southward of the island.

Grave Island Light (57°16.0′ N., 134°04.9′ W.), 16 feet above the water and shown from a white wooden house on the southeast side of Grave Island, marks the entrance to Pybus Bay.

Midway Islands are the triangular group of wooded islands lying northward of Southwest Islands and eastward of the entrance to Cannery Cove. Each island of the group has foul ground surrounding it. A dangerous rock which uncovers 2 feet is 0.8 mile southeastward of the northern island. A 2-fathom rock lies about halfway between this dangerous rock and the northern island.

Cannery Cove indents the western shore of Pybus Bay, about 3.5 miles northwestward of Elliott Island. The cove is nearly landlocked and affords secure anchorage in 6 to 15 fathoms, sticky bottom. A large island with an islet close to the southward, forms the north point at the entrance. A rock with ¼ fathom over it, and marked by a buoy on its eastern side is in the middle of the entrance. A daybeacon on the southern entrance point marks the turn into the bay. Only a few broken piles mark the site of the cannery wharves which formerly stood on the southern shore of Cannery Cove.

Donkey Bay, on the west side of Pybus Bay, about 1.8 miles northward of Cannery Cove, is an open bight which bares in its western part and is of no importance to navigation.

The channel between Point Pybus and the San Juan Islands is not recommended except for small craft with local knowledge.

The best passage between the eastern and western parts of the bay is between the northwestern Midway Island and the mainland. An unmarked rock with a depth of 2½ fathoms over it is 0.5 mile west of the northern point of the northeastern Midway Island. West Channel, described below, is recommended for vessels bound for Cannery Cove.

West Channel extends between Grave Island and Southwest Islands and then between the Midway Islands and the western shore of the bay. Several dangers, which are shown on the chart, are passed when using this channel. Rocky islets about 6 feet high are about 0.6 mile southward of Grave Island. They are not easily picked up at night. Between Spruce Island and the entrance to West Channel, strong cross currents may be encountered.

Little Pybus Bay, close westward of Pybus Bay, is about 2.5 miles long and 1 mile wide at the entrance, and is open to the southward. A chain of islets, reefs, and broken

ground extends about 1.5 miles southward of the eastern entrance point. Shoal water, on which there are several islets and rocks, extends about 1.2 miles from the head of the bay.

Spruce Island, small and wooded, is 2 miles from the Admiralty Island shore and 6 miles northwestward from Turnabout Island. A ledge which uncovers 4 feet extends 500 yards southwest of the island.

Chart 8216.—Woewodski and Eliza Harbors have a common entrance between **Point Napean** and **Deepwater Point** 9 miles westward of Turnabout Island. The entrances are much obstructed by dangerous ledges, and with the close proximity of better anchorages the use of these harbors is seldom necessary. **Liesnoi Island,** of irregular shape, lies in the entrance.

Woewodski Harbor is the open bight between Liesnoi Island and Deepwater Point. Ledges and rocks, covered or awash at various stages of the tide and generally marked by kelp, extend northeastward from Liesnoi Island halfway across Woewodski Harbor. **Polivnoi Rocks,** three bare rocks surrounded by ledges, lie at the northern edge of this foul ground. The only anchorage for large vessels in Woewodski Harbor is northeastward of this foul ground in 20 to 26 fathoms, hard bottom, and exposed to southeast winds. Small vessels find temporary shelter off **Bluff Point** in 6 fathoms, and south of Polivnoi Rocks in 3 to 6 fathoms, soft bottom.

Eliza Harbor is a deep inlet with generally bold shores. The only available anchorage is at the south end of the harbor, off the western side of Liesnoi Island in depths of 18 to 20 fathoms. On each side of Liesnoi Island are narrow passages, called, respectively, North and South Passage, leading to Eliza Harbor.

North Passage to Eliza Harbor enters from the northwestern part of Woewodski Harbor. This passage is straight, but narrow; its northern shore is bold-to, its southern shore foul, and sunken rocks and kelp patches extend to midchannel, leaving a navigable passage 75 to 100 yards wide with least depths of 6 fathoms. The rocks on the south side of the passage cause tide swirls; the ebb has a velocity of 4 knots, and the flood about 3 knots. When through the passage, haul southward and anchor in midchannel in 18 to 20 fathoms, soft bottom in places, at two-thirds the distance toward **Thumb Point,** the southwestern extremity of Liesnoi Island.

South Passage, south of Liesnoi Island, is reduced by sunken rocks at its narrowest part to a width of 70 yards, has a sharp turn and strong tidal currents, and should not be attempted except at slack water and with local knowledge. The rocks are marked by kelp, which, however, does not show when the current is running. In northerly winds, an indifferent anchorage may be had in the entrance to South Passage in 6¾ fathoms, with the southeast side of Liesnoi Island bearing 082°, and Point Napean and **Sharp Point** in line, bearing 189°.

Chart 8242.—Chapin Bay is a small inlet on the north side of Frederick Sound, and on the southwest side of Point Napean, affording secure anchorage in 9 to 11 fathoms, sandy bottom. A reef, marked by kelp, extends 0.6 mile northeastward from the west point at the entrance, terminating in a bare ledge in the middle of the entrance. A ledge, bare at half tide, is 330 yards southwestward from the north point at the entrance, and kelp shows about 400 yards southward of the ledge. There is also kelp in the middle of the channel, about 0.8 mile inside the entrance, and a shoal extends 150 yards eastward from the point on the western side of the southern entrance to the narrows.

It is safest to enter Chapin Bay at low water. Enter about 400 yards southwestward of the half-tide ledge off the north point at the entrance and keep the north shore aboard at a distance of 200 yards until in the narrows. A midchannel course leads safely to the anchorage in the basin above the narrows.

Herring Bay, 6 miles northeastward of Carroll Island, has its entrance between **Point Brightman** and the point to the northward, which separates Herring Bay from Chapin Bay. A tongue of land, prolonged by rocks, reefs, and kelp patches, extends in a southeasterly direction from the bay, dividing it centrally into two parts.

There is a fair anchorage, open to the southeast, in the southwest corner of the bay, about 0.8 mile from the head. To make this anchorage, follow the south shore at a distance of about 0.4 mile, the chart being the guide.

Chart 8252.—Carroll Island, a small island about 5.5 miles westward of Point Brightman, is conspicuous, but it appears as a point of the main shore.

Chart 8242.—Walker Point, 2.3 miles westward of Carroll Island, is the end of a low wooded peninsula separating Murder Cove from a foul bight eastward of it. Ledges and kelp surround the point to a distance of 0.2 mile.

Bartlett Point is the end of a long, low wooded strip separating Murder Cove from Surprise Harbor; the end of the point is two wooded islands, joined by dry ledges. A bare ledge extends 300 yards southward, and foul ground marked by kelp extends 0.5 mile southeast and southwestward of the point, also over half-way across Surprise Harbor.

Murder Cove has its entrance between Bartlett Point and Walker Point, 2 miles eastward of Point Gardner. The channel narrows to 300 yards 0.4 mile inside the entrance, between a bare ledge on the east and two rocks, each with a clump of scrub, on the west. **Murder Cove Light (57°01.7′ N., 134°33.2′ W.),** 25 feet above the water, is shown from a small white house on the bare ledge on the eastern side. Above the light the channel has a width of about 200 yards between kelp-marked ledges, and it is best to enter at low water when the dangers show. A daybeacon marks the east side of the channel about 0.6 mile above the light. The tide rips are sometimes heavy across the entrance when the wind is strong against the current.

Tyee is an abandoned cannery on the east side of Murder Cove, about 1.2 miles northward of Walker Point. The cannery wharf is in ruins and only sunken piles,

extending 400 feet from shore, remain of the outer half of the wharf. The oil wharf, southward of the cannery wharf, is completely demolished. A seaplane float is close northward of the cannery wharf. Good anchorage is in midchannel, in 8 to 11 fathoms, off the wharf ruins, and slightly east of the range of Murder Cove Light and the daybeacon.

Point Gardner, the southern extremity of Admiralty Island, is low and wooded, and has two rocks 20 to 30 feet high, 600 yards southward of the point. The westerly of the two rocks is marked by **Point Gardner Light (57°00.6′ N., 134°36.8′ W.),** 65 feet above water and shown from a small white house on a steel skeleton tower. A prominent mound is 0.2 mile back from the point and 1.3 miles from the point is a conspicuous round hill. The water is clear 0.2 mile from the rocks off the point, but the rocks should be given a berth of 0.5 mile to avoid tide rips frequently encountered.

Surprise Harbor, on the east side of Point Gardner, is open southward, has much kelp, and is not a good anchorage. It is, however, a good lee when the wind is blowing strong down Chatham Strait.

To enter, keep from 0.2 to 0.5 mile off the west shore, using caution and avoiding kelp. Anchor about midharbor in 7 fathoms, rocky bottom.

Chart 8252.—Yasha Island, about 3.5 miles southeastward of Point Gardner, is small, low, wooded, and surrounded by kelp to a distance of 200 yards. A rock with a depth of 1¾ fathoms over it is about 1 mile 318° from the north point of the island. A buoy marks the northwest side of the rock.

Heavy tide rips will be found between Yasha Island and the buoy. These tide rips sometimes extend across to Point Gardner and along that shore eastward as far as Carroll Island, and are dangerous for small boats.

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9. STEPHENS PASSAGE

Chart 8002.—Stephens Passage extends from its junction with Frederick Sound at Cape Fanshaw in a general north-northwesterly direction for 88 miles to Shelter Island which divides it into two channels, Saginaw Channel and Favorite Channel, which connect it with Lynn Canal. Numerous islands are in both entrances to the passage, but otherwise it is open, deep, and generally free from dangers.

Anchorages.—The waters of Stephens Passage and its branches are generally deep and there are few good anchorages. Anchorage can be had in Cleveland Passage, Gambier Bay, Seymour Canal, Taku Harbor, Gastineau Channel, Young Bay, Fritz Cove, Barlow Cove, Tee Harbor, and Eagle Harbor. Temporary anchorage can also be found in Port Houghton, Hobart Bay, Sanford Cove (Endicott Arm), Limestone Inlet, Taku Inlet, and Adams Anchorage.

Weather.—The prevailing winds are southeasterly throughout the year. During the winter months the winds are more variable and winds from the northeast quarter may prevail, particularly in January. Southeast gales may occur at any season but they are more frequent and more severe in winter than in summer. Fog may occur at any time but is more frequent during the winter months, reaching its maximum in January. The least fog occurs during April to July, inclusive, the minimum being in May.

Ice is discharged from glaciers in Tracy and Endicott Arms and is always found in Holkham Bay, and is prevalent in Stephens Passage off the entrance to that bay. Occasional pieces of ice may be expected in all parts of the passage. In daytime with clear weather it is not a serious menace to navigation, but is dangerous at night or in thick weather.

Currents.—The flood current enters Stephens Passage from both ends and meets in varying places westward of Point Arden; the ebb current flows in the opposite direction. The velocity of the current is 1 to 2 knots. In Saginaw Channel, the current frequently ebbs throughout the day when the moon is in quadrature. The ebb current in this channel is considerably stronger than the flood. The currents have considerable velocity in the entrance to all the larger bays and inlets which make off from Stephens Passage, causing tide rips and swirls.

For daily predictions for places in Stephens Passage, see the Tidal Current Tables.

Chart 8216.—Cape Fanshaw, on the easterly side at the junction of Stephens Passage and Frederick Sound, is a long, low wooded point terminating in a sandspit, with a large boulder at the extreme end and deep water within 0.2 mile.

Cape Fanshaw Light (57°11.1′ N., 133°34.3′ W.), 41 feet above the water, is shown from a small white house on a skeleton structure on the point of the cape.

Fanshaw Bay, on the northwest side of Cape Fanshaw is connected with Cleveland Passage by South Passage. Anchorage can be made in the southeast side at the head, about 600 yards offshore and 0.5 mile southwestward of Whitney Island in 12 to 15 fathoms, sand and shell bottom, sheltered from northeasterly and southeasterly winds.

Storm Islands, about 1.5 miles northward of Cape Fanshaw, consist of a wooded island and several rocks, the southernmost, **Bird Rock,** is grass-covered, and marked by a daybeacon on the southwest side. A shelving ledge extends 300 yards westward of Bird Rock. A grass-covered rock is between the larger Storm Island and Bird Rock. There is no safe passage through Storm Islands and adjoining rocks, and the passage between Storm Islands and Whitney Island is narrowed to 0.6 mile by a ledge awash at half tide 0.2 mile northeastward of the north end of Storm Islands.

Whitney Island, wooded, forms the northeastern shore of Fanshaw Bay and the western shore of Cleveland Passage. The buildings of a fox farm are in the bight in the eastern shore westward of West Spit. **Duck Point,** the southern point of the island, and **Bill Point,** the northern point, are marked by lights.

Cleveland Passage, separating Whitney Island from the mainland, is 0.5 mile wide and affords good anchorage near its southeast end. The depths vary from 8 fathoms at its southeast end to over 70 fathoms at the northwest end. The anchorage is about 0.8 mile northward of the narrowest part of South Passage, favoring the eastern shore, in 12 to 20 fathoms, soft bottom, care being taken to keep clear of East Spit. Small craft find anchorage in 4 to 8 fathoms east and north of East Spit. Winds from west to north bring in a slight swell but do not seem to blow home with any force. Winds from southeast, however, blow down from the mountains with great force during the southeast blows in Frederick Sound.

The entrance from northwest is much safer because a midchannel course leads safely to the anchorage. **South Passage** has a midchannel depth of 11 fathoms. At the north end of South Passage are **East** and **West Spits,** projecting northward, the former 0.2 mile into the southeast end of Cleveland Passage. A daybeacon marks a rock on the north end of West Spit.

Small boats find anchorage between Duck Point and the mainland in 12 fathoms.

The **tidal currents** have a velocity of 1 to 2 knots in South Passage.

Cape Fanshaw is a fishing village on the east side of

the South Passage. A float is anchored directly offshore for fishermen to moor to during the season. The local mail boat from Juneau calls weekly.

Steamboat Bay is 1 mile northward of Whitney Island and has Foot Island on its northern side. **McNairy Point** is the south point and **Fort Point** the north point at the entrance. The bay has 22 fathoms of water, and with the near proximity of Cleveland Passage has no advantage as an anchorage. **Foot Island** is connected by a sand spit with the small islet at the head of the bay. The narrow passage on the north side of Foot Island might afford shelter to small craft in 7 to 10 fathoms abreast the middle of the island.

Chart 8201.—The Five Fingers, about 6 miles north-northwestward of Cape Fanshaw, are a group of islets, the larger ones wooded, and ledges extending 3 miles in a northwesterly direction and 1.5 miles wide. The southeasterly islet is marked by **Five Finger Light (57°16.3′ N., 133°37.8′ W.),** 81 feet above the water and shown from a 68-foot white concrete tower rising from the center of a building. A fog signal and radiobeacon are at the light. A reef, covered at high water, extends 300 yards southwestward from the light.

Akusha Island is the northerly island of the group, and the largest. Rocks lie about 1 mile to the westward. Deep-water channels are on all sides of the group.

Sail Island, about 5 miles northwestward of Five Finger Light is wooded. It has two hummocks with low land between and is conspicuous when approaching from the northward. At the southern end are two small islets and a rock awash.

False Point Pybus is about 5 miles northeastward of Point Pybus. A daybeacon marks the point 1 mile to the southward of False Point Pybus.

Point Walpole on the east side of Stephens Passage, about 7.3 miles northward of Cape Fanshaw, is the western extremity of the western wooded islet on the south side of the entrance to Port Houghton. The shores of the bight southeastward of the point are foul.

Port Houghton is an extensive bay, about 9 miles above Cape Fanshaw. **Roberts Islands** are a group of islands forming the south point of the entrance. The waters of Port Houghton are very deep, and it affords no shelter for large craft. A good small-craft anchorage may be found in the long narrow arm southeast of **Walter Island** in 8 fathoms, soft bottom. This is a good winter anchorage if ice does not bother. A midchannel course into it is clear. The proximity of Cleveland Passage makes it unnecessary to use Port Houghton for anchorage except in winter.

McDonald Rock lies in the broad part of Stephens Passage, about 8.8 miles northward of Five Finger Light; it is small, has 3½ fathoms over it with deep water close-to, and is marked by a buoy on its northern side. The range of the southeast tangent of The Brothers over the middle of Sail Island crosses this dangerous rock, which is almost directly in the track of vessels from Cape Fanshaw through Stephens Passage.

Chart 8218.—The Twins are two wooded islets about 9.6 miles north-northeastward of Five Finger Light and off the entrance to Hobart Bay.

Hobart Bay, on the north side of **Point Hobart,** has its entrance about 14 miles northward of Cape Fanshaw and 3 miles eastward of The Twins. Off the south point at its entrance is a bare ledge, marked by kelp, which extends 0.2 mile offshore from an islet.

Entrance Island, 458 feet high, lies in the entrance to Hobart Bay. A small islet is 0.1 mile northward of the island. A small bay, suitable for small craft, indents the southeastern side of the island for about 300 yards. A house on the neck of land that forms the south side of the entrance to the small bay is prominent when coming around the south side of the island from westward. There is good shelter at a float in the bay. The mail boat from Juneau calls weekly.

About 0.5 mile northeastward of Entrance Island, projecting points narrow the entrance into the inner bay. Bars, on which there are rocks awash, extend from the points of this entrance, leaving a navigable channel about 100 yards wide and 5½ fathoms deep into the inner bay. A rock with 1 fathom over it has been reported about 0.5 mile north-northeastward of the south point at the entrance to the inner bay.

Just within the entrance to the inner bay, a narrow arm leads northwestward to a basin, where a constricted anchorage in 10 fathoms may be found. In entering this basin, pass close eastward of the rocky islets just inside the entrance.

The channel leading to the basin at the head of the bay is very narrow, and heavy overfalls, dangerous for small craft, are experienced at the end of the narrow passage except during a short period at slack water.

Temporary anchorage may be found in 27 fathoms, soft bottom, northeastward of Entrance Island, with the north point of the entrance to Hobart Bay in range with the south shore of the small islet northward of Entrance Island. Temporary anchorage may also be found in the bight southeastward of Entrance Island in 17 fathoms, soft bottom, about 0.2 mile from a fine sand beach. The north tangent of the eastern of The Twins just shuts in the south tangent of the western of The Twins.

Caution.—The foregoing information relative to anchorages has been obtained from a source considered reliable. In entering the southern anchorage favor the shore of Entrance Island, keeping on the range mentioned above. A ledge makes out about 160 yards from the point on the south shore.

Sunset Island is a large rounded islet, about 4.5 miles northward of The Twins and southwestward of the entrance to Windham Bay. A reef awash is about 0.1 mile off the south shore, and a rock awash at low water is about 0.1 mile off the eastern point of the island. The Federal Aviation Agency maintains a station called **Sunset Cove,** on the north point of a promontory about 2.5 miles southeastward of Sunset Island. Eight white and orange radio towers and a white building with orange roof are on the high point of the promontory.

Windham Bay, on the south side of Point Windham, has its entrance about 17 miles northward of Five Finger Light. In the middle of the entrance is a small group of wooded islets, with a deep passage on either side. Reefs extend about 0.2 mile eastward of the islands. Close eastward of Point Windham is another small group of islets. The northernmost islet is wooded, and the islet southwestward of it has some shrubbery on it.

Windham Bay Entrance Light (57°33.7′ N., 133°32.6′ W.), 35 feet above the water, is shown from a small white house on the southeasternmost islet, about 0.6 mile eastward of Point Windham.

From its 1.5-miles-wide entrance, Windham Bay narrows rapidly and connects with a deep inner basin nearly 4 miles long and 0.5 mile wide. This narrow connecting channel is constricted to 100 yards by a ledge on its north side which bares. From the point on the south shore southeastward of the ledge, a spur that bares extends about 20 yards. A small wooded islet is close to the north shore about 0.6 mile westward of the narrows. An extensive flat extends from the southeast side at the head, leaving a passage about 0.2 mile wide close to the north shore up to the ruins of the village of **Windham.**

There are several gold prospects in the vicinity, and a log road extends about 2 miles from the site of the former village to one of the prospects. **Chuck River,** entering the head of the bay, is reported to be navigable in a pulling boat for about a mile. During the winter the head of the bay to the narrows may be frozen over. A trail maintained by the Forest Service extends from the narrows along the south shore and up the river to a crossing. A mail boat from Juneau calls weekly at the outer bay.

Indifferent anchorage, in about 20 fathoms, may be had off the ruins of Windham northward of the flat. There is constricted anchorage in the cove just eastward of the south point of the entrance to the bay in 25 fathoms. Small craft anchor closer in.

A fog bank of varying density frequently hangs over Windham Bay from the narrows well up toward the head, especially at night.

Windham Bay and its approaches are clear. In passing through the narrows great care should be exercised and the south shore kept aboard at a distance of about 50 yards.

Chart 8201.—Point League, about 5 miles northwestward from Point Windham, is a gently rounding precipitous point. The cliff, about 30 feet high, is whitish. The point rises rapidly to a lofty mountain with partially bare slopes. **Point Lookout** is about 2 miles northward of Point League and is hummock and timebered.

Anchorage has been obtained in the cove between Point League and Point Lookout by a vessel 150 feet in length in 15 fathoms close to the entrance near the north shore, but is not recommended. It is exposed to southwesterly winds and is constricted by a shoal making out from the south shore and shoal water inside the cove.

Thistle Ledge, covered at high water and marked by kelp, lies about 0.6 mile from the eastern shore of Stephens Passage about 1 mile northward from Point Lookout and 3 miles southward of Point Astley. Between Thistle Ledge and Point Astley, the shore is foul. A small islet is 0.9 mile southward of Point Astley.

Chart 8224.—Gambier Bay has its entrance on the western side of Stephens Passage, about 8 miles northward of The Brothers. There are numerous islands and ledges in the entrance, but with the aid of the chart it can readily be entered in the daytime.

Point Gambier, the northeastern point at the entrance to Gambier Bay and the southeastern end of Gambier Island is marked by **Point Gambier Light (57°26.1′ N., 133°50.3′ W.),** 38 feet above the water and shown from a small white house.

The bay is irregular in shape and is divided into two parts by a chain of narrow islands and reefs. The outer bay, extending from Point Gambier about 7 miles in a north-northwesterly direction, is about 2 miles wide at the entrance; its northern end is an inlet which affords anchorage in 15 to 20 fathoms, soft bottom. Anchorage in 6 to 16 fathoms, mud bottom, can be had northward of **Good Island.** It can be approached without difficulty, but care should be taken to avoid the foul ground extending off the northwest point of Good Island.

Romp Island is about 0.4 mile northwestward of Gambier Island with ledges between.

The chain of islands and reefs, including Chapel and Price Islands, paralleling Gain Island and the mainland at Church Point, divides the outer part of the bay into two passages. The fairly straight narrow channel westward of this chain is considered the better approach to the inner parts of the bay. In navigating this passage care should be taken to avoid the bare rocks, which extend 165 yards out from the point, 0.5 mile southward of **Church Point.**

Price Island is 600 yards from the west shore of the outer bay. A rocky shoal with a least depth of 5 fathoms is 1 mile 133° from the south end of Price Island, with deep water between it and the ledges, which have a number of bare heads, extending 0.6 mile southeast of the island. A large, conspicuous, gray boulder on the southern ledge is a good landmark.

Chapel Island, small in extent, is about 0.8 mile northward of Price Island. A rock which bares 1 foot, and marked by a buoy, lies 0.4 mile eastward of Chapel Island. Ledges extend about 0.9 mile northwestward from the northwest point of Chapel Island to a channel about 450 yards wide. The reef on the northwestern side of this channel is marked by a light, 22 feet above the water, shown from a white slatted tower with a concrete base.

Tree Island appears as a clump of trees just northward of **Gain Island.** At low water Tree Island appears at the end of a spit off Gain Island—in reality a part of Gain Island. About 0.3 mile northwest of Tree Island is a much larger unnamed island, which is wooded. Two pinnacle rocks, covered 2½ and 2 fathoms, are 700 and 1,100 yards, respectively, northwest of the unnamed island. Once past these rocks, the inner bay is relatively clear.

Ruins mark the site of the cannery formerly located in the bight 1.8 miles northwestward of Gain Island.

Snug Cove, on the south side of the inner bay, has anchorage in 15 to 20 fathoms, soft bottom. Small craft find good protection here in 4 to 7 fathoms. Large vessels reach the cove by way of the channel close eastward of Church Point, Gain Island, and the unnamed island to the northwest; the northwest end of the unnamed island can be rounded at a distance of about 300 yards, thence a southerly course can be laid to pass about midway between the unnamed island and Muse Island, 0.7 mile to the southwest. Only small boats can navigate the passage between Church Point and Gain Island because of the rocks.

Tidal currents have a velocity of about 3 knots in the passage between Church Point and Gain Island, and some swirls occur around the ledges eastward and northward of Gain Island.

The preceding paragraphs have pointed out the channels into Gambier Bay and the dangers to be avoided. Specific courses would be of little help and could be confusing. The navigator should pay close attention to the chart.

Charts 8201, 8202.—Seymour Canal has its entrance westward of Point Hugh, 15 miles northward of The Brothers. It extends in a northwesterly direction into Admiralty Island for 35 miles, with an average width of about 2 miles. The upper part of the canal (Chart 8202), to a distance of 20 miles from its head, is filled with islands, ledges, and rocks. **Tiedeman Island,** 15 miles above Point Hugh, divides the canal for a distance of 8 miles, and above Tiedeman Island is another large island called **Swan Island.** The waters of the canal are, in general, deep, and passing eastward of Tiedeman and Swan Islands, the canal may be navigated to its head, though above the former island the passage is narrow and somewhat intricate. In the upper part of the canal the depths are moderate, and anchorage can be selected in places for which the chart is the guide. The extreme head of the canal is separated by a portage of less than 0.5 mile from Oliver Inlet.

Point Hugh is the southern extremity of **Glass Peninsula,** a long, narrow, and moderately high strip of land, which separates Seymour Canal from Stephens Passage. Rocks, awash, lie about 400 yards off the point.

Chart 8228.—Pleasant Bay is a small cove on the western side of the Seymour Canal, 7 miles above Point Hugh, which affords anchorage for small craft. Two islets are in its entrance. The channel between the two islets is obstructed by a dangerous rock. It is reported that a reef extends about 200 yards northward from the northwestern islet. The best channel to enter is said to be between this reef and the very prominent point of broken rock resembling a breakwater on the northwestern side of the entrance. This breakwater reef shows prominently at all stages of the tide. The channel is about 75 to 100 feet from the point of the breakwater reef. Anchor in 6 fathoms about 300 yards southwestward of the northwestern islet. The bottom here is apparently a thin layer of mud on rocks which makes poor holding ground in heavy southerly weather. A spit extends about 125 yards southwestward of the islet.

The head of the bay bares except for a pool just westward of the small point which projects from the west shore. Small craft can pass into this pool at high water and have sufficient depth and swinging room for one or two boats at low water. This is an excellent shelter in north winds. A spring is in the little bight near this pool and fresh water can be obtained.

Mole Harbor is on the western shore of the canal, about 9 miles above Point Hugh. A flat extends about 0.6 mile from the head of the harbor with deep water close to its edge. **Beacon Rock,** small and bare, is near the middle of the entrance, and another bare rock is about 200 yards westward of it. The ground is foul between Beacon Rock and the southern point at the entrance. **Rasp Ledge,** a small bare rock, is 0.2 mile northeastward of **Flaw Point,** the northern point at the entrance. All dangers show at low water. Enter midway between Beacon Rock and Rasp Ledge and anchor in 13 to 17 fathoms, sticky bottom, about 1 mile within the harbor, giving the shores a berth of about 0.2 mile. Small craft can find anchorage southwest of Beacon Rock in 3 to 10 fathoms, mud bottom.

Charts 8201, 8202.—A rock awash at low water and surrounded by an extensive bed of kelp is 1 mile southward of the southeast end of Tiedeman Island.

Short Finger Bay is a small bay on the eastern shore of Seymour Canal, directly east of Faust Island. Good shelter from southerly weather and anchorage in 5 to 10 fathoms, mud bottom, can be had here.

Dorn, Faust, and **Bug Islands** are small, wooded islands in the eastern part of the canal. **Winning Cove** is a shallow inlet in the eastern shore of the canal, opposite Tiedeman Island, and is of no importance.

Chart 8228.—Windfall Harbor is on the western shore of Seymour Canal, abreast the northwest end of Tiedeman Island. **Windfall Island,** large and high, is in the middle of the entrance. A flat extends about 0.8 mile from the head of the bay, and a long bight indents its western shore 1.5 to 2.8 miles southward of Windfall Island; both dry. The entrance is southeast of Windfall Island, between **Late Point** and **Staunch Point;** the passage on the northwest side being foul. The midchannel depths in the harbor range from 12 to 16 fathoms.

On the western shore near the head of the harbor is a trail marker and shelter cabin. A trail, maintained by the Forest Service, starts near the cabin and extends inland 9 miles to **Lake Hassellborg.** There are two cabins on the shore of the lake.

On the shoreline west of the north end of Windfall Island is a trail marker indicating the beginning of a trail maintained by the Forest Service, running 1 mile inland to a bear observation sheltered platform.

Chart 8202.—Windfall Harbor should be approached only by the channel westward of Tiedeman Island, which is about 0.8 mile wide. In using this passage keep in midchannel, except at a point 2 miles above the southeast end of the island, where the western shore, which is bold, should be kept best aboard to avoid a patch of rocks about 600 yards off the eastern shore. Enter the harbor southeastward of Windfall Island, and anchor anywhere in 15 to 17 fathoms, sticky bottom, preferably near the southeastern shore.

King Salmon Bay, on the western side of the canal near its head, affords anchorage but the approach is difficult. The Fish and Wildlife Service patrol vessel BRANT reported grounding on a gravel bar extending 100 yards westward from the end of the long point forming the west side of the bay.

Chart 8201.—Point Hugh Light (57°37.2′ N., 133° 48.4′ W.), 38 feet above water, is shown from a white horizontally-slatted tripod on the point 2.9 miles northward of Point Hugh. About 1.2 miles southward of the light, rocks extend offshore about 0.2 mile.

Midway Point, about 10 miles northward of Point Hugh, is distinguishable from seaward and made prominent by a white rock cliff about 30 feet high, backed by a round grassy knoll.

Point Glass, about 4.5 miles northward of Midway Point, is an indefinite point. The shore is steep and rocky. Rocks covered at half tide lie about 0.2 mile offshore, 0.9 mile southward from the point. A rock, awash at half tide, lies 0.3 mile southward of the point about 100 yards offshore.

Holkham Bay is an inlet, with two extensive arms, which lies on the eastern side of Stephens Passage about 28 miles northward of Five Finger Light. The water in both arms is very deep, in some places more than 200 fathoms. The tidal currents have considerable velocity in the entrance to the arms and there is at times floating ice which makes navigation somewhat hazardous. In both arms the shores are steep and high.

Point Astley is the southern and **Point Coke** the northern point at the entrance. A group of three islets lie about 0.1 mile off Point Astley. The highest of the three is about 35 feet high; the westernmost about 15 feet high; and the third, close northeastward of the highest one, is about 5 feet high. A gravel bar connects the two larger ones at low water.

A cove about 0.2 mile in extent, close under the eastern side of Point Coke, might afford a lee and anchorage for small craft with heavy northwest winds blowing down Stephens Passage.

An anchorage with shelter from southeast winds may be had in the western bight between Point Astley and Wood Spit, in 20 to 30 fathoms, hard bottom.

Harbor Island is a high wooded island in the middle of the entrance to Holkham Bay. In northerly weather the bight on the southeast side of the island affords safe anchorage for small craft in 2 to 8 fathoms, hard bottom. A group of five islets, the largest and southeasternmost of which is **Round Islet,** lies within 0.7 mile southeastward of Harbor Island. There is a safe passage through the group for small craft.

A long low wooded point extends westward from the mainland eastward of Harbor Island. An extensive flat, with boulder patches on it, extends up to 1.2 miles from the point. The edges of the flat are steep-to. **Sand Spit,** a small islet, stands on the southeastern edge of the flat. Two bare rocks on the flat are 0.4 and 0.8 mile southwestward of Sand Spit.

The passage between Harbor Island, the Round Islet group, southeastward of it, and the flat, is 0.8 mile wide and has depths of 23 fathoms in midchannel.

Wood Spit is a long narrow spit extending about 0.8 mile in a northerly direction from the southern entrance point of Endicott Arm. At high water, it shows as an island about 20 feet high with three trees. Two boulder patches are 0.2 mile northward of the spit. **Wood Spit Light (57°44.3′ N., 133°34.7′ W.),** 27 feet above the water and shown from a small house on a skeleton tower on a concrete base, is on the northerly of the boulder patches.

Between Wood Spit Light and the southwestern end of the flats northward of it, the channel leading into Endicott Arm is 0.5 mile wide and has depths of 13 fathoms.

Endicott Arm is the southern arm of Holkham Bay. **Sumdum Island** is in midchannel, abreast Sanford Cove. **Bushy Islands** are two small islets midway between it and the northeastern shore. **Dawes Glaciers,** at the head of the arm, extend to the water's edge.

Fords Terror is a narrow inlet which extends 5 miles in a northerly direction. Its entrance, dangerous except at slack water, is on the northern side of Endicott Arm, 10 miles southeastward of Sumdum Island. Tidal currents rush through the narrowest part of the inlet with great velocity. The controlling depth through the narrows is reported to be 2½ fathoms. Fords Terror has magnificent scenery.

Brown Glacier at the head, is reported to have receded, and the shoreline is about 0.5 mile eastward of the former charted position of the edge of the glacier.

Sanford Cove, on the southern shore of Endicott Arm, 5 miles within the entrance, is the only available anchorage in the arm. It has a depth of 35 fathoms, and is protected except from northerly winds. **Rock Point** forms the northeast side of the cove. A shoal with a depth of 7 fathoms extends 0.3 mile off the point. A flat extends out 300 yards in the southern part of the cove. An occasional piece of ice drifts into the cove, but is of no danger to vessels at anchor. **Sumdum** is a village on the southeast side of the cove. Some mining has been done here.

Chart 8202.—Tracy Arm, the north arm of Holkham Bay, takes a general northerly direction for 9 miles and then turns eastward 13 miles to its head, where two large glaciers, North and South Sawyer, discharge into salt water. The arm is often clogged by small icebergs for several miles, and great care is needed in navigating the ice field. At times **South Sawyer Glacier** is very active, huge blocks of ice falling off its face into very deep water.

These set up waves which have been observed as high as 25 feet; however, a small boat can ride the waves safely if it keeps a few miles distant from the glacier face and avoids getting packed in the ice flow. **North Sawyer Glacier** ordinarily is much less active. Tracy Arm, with its deep water and bold shores, is one of the outstanding fiords of southeast Alaska.

The entrance to the arm is about 1 mile wide, but the navigable channel is constricted but not to the extent of making it unsafe to enter. The point of the rocky shoal on the northwest side is marked by a buoy moored in 30 feet. The entrance between this buoy and the buoy marking the shoal water on the southeastern side is 0.3 mile wide. The shoal on the southeastern side is marked by heavy kelp beds in summer. Tide swirls will be met in the entrance except at slack water.

A deep-water anchorage with constricted swinging room is at the head of the large bight on the western side of the arm 6 miles from the entrance to the arm. To enter Tracy Arm pass between the buoys marking the entrance and proceed in midchannel; the chart being the guide.

The **tidal currents** have an estimated velocity of 4 knots at the entrances to Tracy and Endicott Arms, forming swirls in these areas. Currents of much greater velocity are found in Fords Terror.

Directions, Holkham Bay and Endicott Arm.—In approaching from southward give the eastern shore of Stephens Passage a berth of 1 mile or more. From a position 0.8 to 1 mile northwestward of Point Astley steer for **Sumdum Glacier,** and pass in midchannel between Wood Spit Light and the Round Islet group.

In approaching from westward, pass about 0.5 mile southward of Point Coke and steer southeastward, leaving Harbor Island 0.2 mile or more to northeast. Follow around the south side of Harbor Island and the Round Islet group at 0.2-mile distance, pass midchannel between the latter and Wood Spit. The chart should be the guide.

Ice is discharged by glaciers in both Tracy and Endicott Arms, and is always present in Holkham Bay, sometimes in large quantities, and is prevalent in Stephens Passage off the entrance to the bay in greater or smaller quantities. This ice is dangerous at night or in thick weather, and in entering Tracy or Endicott Arms care should be taken when near the ice, as the swirls are often dangerous.

Midway Islands are two small, sparsely wooded islets, 16 miles northward of Point Hugh and 2 miles off the eastern shore of Stephens Passage. Rocks, awash at highest tides, are between them, with deep water close-to. A ledge extends about 0.2 mile southward from the southerly islet which is marked by **Midway Islands Light (57°50.2′ N., 133°48.7′ W.)**, 73 feet above the water and shown from a small white house on a tower.

Twin Point, a narrow point with steep rocky shores, the more northerly of two similar points, lies on the west side of Stephens Passage, about 7 miles north-northwestward of Point Glass.

Station Point, about 6 miles to the northward of Twin Point, is wooded and rises to a knob 1.5 miles from the shore. A small wooded islet 105 feet high, lies 300 yards off the point. The bight, about 0.5 mile southward of the islet, is used as a fair-weather anchorage by small craft.

South Island, about 2 miles southeastward from Station Point, is wooded. Reefs extend 50 to 100 yards from its shores and from the southeastern end extend 0.5 mile. Two small wooded islets lie close to the point to the southwestward of South Island. Anchorage in 14 fathoms, sticky bottom, has been made to the westward of South Island. In the bight to the southward of the small islets, small craft find fair-weather anchorage.

Chart 8227.—Port Snettisham has its entrance on the east side of Stephens Passage, about 7 miles northward of Midway Islands and 10 miles southeastward of Grand Island. It is 1.5 miles wide at the entrance, and has a northeasterly direction for 5 miles, narrowing somewhat, and then divides. The north arm is 7.5 miles long to the flat at the mouth of **Speel River** at its head. **Gilbert Bay,** the south arm, is 3.5 miles long to the flat which extends 1 mile from its head, above which is a low valley 3 miles long to Holkham Bay.

Point Styleman is the northwestern point of the entrance and **Point Anmer** is a mile southward of the southeastern point of the entrance.

The port is entirely free from dangers, but there are large flats at the head of all the arms. On account of the great depth, it is not suitable as an anchorage, though in case of necessity a vessel might anchor in about 20 fathoms at the head of either the north or south arm, close to the flats. Moderately heavy tide rips are sometimes found at the entrance.

Whiting River empties into the middle arm at the northeastern part of Gilbert Bay.

A poor but possible anchorage exists in the small cove west of **Mist Island** in 28 fathoms, sticky bottom. It is exposed to southerly winds and eddies during strong tides. Anchorage can be had directly across from Mist Island, on the southeast side in the small cove which has a cabin at its head, in 5 to 15 fathoms, hard bottom.

Local magnetic disturbance.—Extreme magnetic disturbance exists in Port Snettisham and Gilbert Bay. The magnetic compass should not be relied upon within the area outlined in magenta on the chart.

Chart 8229.—Limestone Inlet, 2 miles southeast of Taku Harbor, is a narrow arm extending in an easterly direction. The depths are 13 to 18 fathoms in the lower half of the inlet, and a small vessel may anchor anywhere in midchannel, but the holding ground is not very good, and with the close proximity of Taku Harbor, vessels seldom find it necessary to enter. The upper half of the inlet is filled by a flat, most of which covers at high water.

Taku Harbor, about 19 miles from Juneau, indents the eastern shore of Stephens Passage about 3 miles southeastward of Grand Island. The entrance is between **Stockade Point** and the southeastern tangent of **Grave Point.** In approaching from the southward, its position is readily known by the projecting high land of Grave

Point and Taku Mountain rising behind the point. A flat extends about 0.4 mile from the head.

Grave Point Light (58°03.8′ N., 134°03.0′ W.), 45 feet above the water, shown from a small red house on the southwestern extremity of the point, marks the north side of the entrance to the harbor.

The anchorage is in about 13 fathoms, soft bottom, favoring the eastern shore. A slight eddy current in Taku Harbor from Stephens Passage is sometimes noticed on the flood and, with large tides, swirls are produced which cause a vessel to surge somewhat on her cables at times. The northerly winter winds from the interior draw through the valley back of the harbor with great force. In the winter these conditions, when at their severest, render the anchorage somewhat dangerous.

In Taku Harbor are abandoned cannery buildings and a large wharf which in 1959 was in ruins. Enter the harbor on a midchannel course using the chart as the guide.

Slocum Inlet lies on the eastern shore of Stephens Passage, 2.5 miles northeastward of Grand Island. It is nearly filled with flats. The water is deep close to the flats, and it does not afford convenient anchorage.

Circle Point, the southern point of the entrance to Slocum Inlet, rises to **Butler Peak,** a prominent conical peak.

Chart 8202.—Grand Island is in the middle of Stephens Passage, 17.5 miles northwestward of Midway Islands and 4 miles southward of Point Arden. It has three knolls and rises abruptly from deep water. A good channel is on each side of the island, the eastward one being favored generally.

A light, 47 feet above the water, is shown from a small red house on the northeastern point of the island.

Cove Point, on the west side of Stephens Passage, about 1.8 miles northwestward of Grand Island, rises to a timbered knob, with a depression between it and a ridge to the northwestward. Two rocks are close to the south shore of the point; the outer rock bares and the inner rock uncovers 12 feet. **Doty Cove,** southward of Cove Point, is deep. Flats at the head of the cove drop off rapidly to 20 fathoms.

Chart 8235.—Point Arden is a rocky bluff on the westerly side of Stephens Passage about 3.5 miles northward of Grand Island and 11 miles from Juneau. **Point Arden Light (58°09.6′ N., 134°10.6′ W.)**, 50 feet above the water, is shown from a small white house on the northeast end of the point.

Taku Inlet on the east side of the passage, has a length of 15 miles from **Bishop Point,** at the entrance from Stephens Passage to Taku Glacier at its head. A light is shown seasonally from Bishop Point.

Anchorages.—There is no secure anchorage in the inlet. The inlet is exposed to strong winds. The best general anchorage, with fair protection from southerly winds, is to be had in 5 to 7 fathoms, soft bottom, 2 miles east-northeast of Jaw Point and about 0.5 mile offshore. Temporary anchorage, partially protected from northerly winds, can be made in from 3 to 7 fathoms, soft mud bottom, eastward of the Annex Creek Power Station and in midchannel, in 3 to 8 fathoms, soft mud bottom, eastward of Flat Point (this anchorage is not sheltered from the wind.)

For a distance of 8 miles, from Bishop Point to 2 miles above Jaw Point the water is deep and the shores bold. Thence to about 2 miles south of Taku Point, a distance of approximately 4 miles, the channel is narrowed by a flat extending out from the eastern shore. From 2 miles south of Taku Point the channel is ill-defined, narrow, subject to change, and should not be traversed without local knowledge.

All soundings north of a line between Scow Cove and Davidson Creek have been deleted from the chart. Large vessels should not venture north of Flat Point due to the extensive shoaling at the head of Taku Inlet. The channel had shoaled to a depth of 2 fathoms 1 mile south of Taku Point in 1959.

Jaw Point is the prominently projecting point on the eastern shore 6 miles within the entrance; there are high cliffs on the eastern shore southward of it. **Flat Point** is on the western shore 3 miles northward of Jaw Point. **Greely Point,** on the eastern shore, 4 miles south of Jaw Point, is distinguished by its reddish-brown color.

Sunny Cove, on the western side of the inlet 4 miles above **Cooper Point,** is a shallow bight on the north shore of which are the ruins of an abandoned wharf. In a small bight between Sunny Cove and Flat Point, about 0.3 mile northeastward of Sunny Cove is the **Annex Creek Powerhouse,** which furnishes electric power to Juneau, and small wharf of the Alaska Juneau Gold Mining Company. The power house constitutes a good land mark. The bottom bares alongside the wharf.

Small craft should exercise caution when maneuvering in shoal water especially off Sunny Cove, Annex Creek Power Station, and off **Turner Creek** on the eastern side of Taku Inlet. There are scattered boulders in these areas which stand 2 to 5 feet above the surrounding bottom. Because of the discoloration of the water it is impossible to see them even when covered by only a foot of water.

There is a flat for 1.5 miles alongshore southward of Flat Point which extends off a greatest distance of 0.5 mile offshore. It has depths of ½ to 2 fathoms over it within these limits and deepens to 10 fathoms in about 0.2 mile. Along the edge of the flat for a distance of 0.2 mile southwesterly of Flat Point, boulders and rock-ledges bare at extreme low water. This area should be avoided by small boats except at high water. If the range Flat Point-Taku Point is kept slightly open, a least depth of 4 fathoms will be had and this flat avoided. Depths increase as the range is opened.

Taku Point is on the eastern shore south of the mouth of Taku River and 4.5 miles northward of Flat Point. Several shacks here are used during the summer by fishermen.

The moraine of Norris Glacier is surrounded by a flat, which bares to a fairly uniform distance of nearly 0.5 mile. It is mostly steep-to at its edge.

Owing to the extensive shoaling at the head of the inlet which bars the mouth of **Taku River,** no directions can be given for proceeding north of the line between **Scow Cove** and **Davidson Creek.**

The early prospectors used to go up Taku River by canoe to the fabulous Yukon gold fields.

Taku Glacier, the discharge of which is blamed for filling in the head of the inlet, is almost the only one of all Alaska's glaciers which is still advancing. It pushes ahead of it vast quantities of sediment which have filled up the formerly deep basins in the inlet.

Winds.—The conformation of Taku Inlet is such that northerly winter gales sweep down the inlet and across Stephens Passage with great force, often accompanied by a blinding snowstorm. Southeast gales draw through the inlet.

Ice.—Taku Glacier has now pushed up the moraine ahead of its face, and ice no longer is a serious threat to navigation in the inlet. A few small chunks of ice occasionally drift down the inlet, but these are rarely more than 3 or 4 feet wide.

The **currents** in Taku Inlet have greater velocity on the ebb than on the flood. At Taku Point, the ebb current has an estimated velocity of 3 to 4 knots at times. At the entrance to Taku Inlet the velocity of the ebb current does not exceed 2 knots. For daily predictions, see the Tidal Current Tables.

Gastineau Channel, separating Douglas Island from the mainland, extends northwestward for 13 miles from Stephens Passage, and then westward for 3 miles to Fritz Cove. Juneau, 8 miles above the southeastern entrance, is practically the head of navigation, except for small craft, as above that point for 2.5 miles to **Salmon Creek,** flats make out from both sides with only a narrow channel between. A Federal project provides for a channel from Juneau to Fritz Cove with the bottom at the elevation of mean lower low water. In July 1960, it was reported that several portions of the channel had silted up and the controlling depth was 3 feet above mean lower low water. The channel is marked by lights.

Marmion Island, about 300 yards to the northeastward of Point Tantallon, the eastern point of Douglas Island and the southern point of the entrance to Gastineau, is small, flat-topped, and bare of trees. **Marmion Island Light (58°11.9′ N., 134°15.3′ W.),** 50 feet above water, is shown from a small white house. A shoal with a least depth of 4¾ fathoms extends 0.2 mile eastward of the light.

Dupont Explosives wharf on the eastern side of Gastineau Channel at the mouth of **Dupont Creek,** has a depth of 30 feet at its face.

Sheep Creek Flat, 4.5 miles above Marmion Island and close southward of Thane, on the easterly side of Gastineau Channel, extends one-third the distance across the channel from the mouth of Sheep Creek and bares. The outer limit of the flat is marked by a light.

Thane is on the northeast side of Gastineau Channel, 5 miles from Stephens Passage. The mine buildings and wharf are in ruins, but some dwellings are occupied. A highway connects with Juneau.

Treadwell, an abandoned mining town with all mine buildings and wharves in ruins, is on the southwesterly side of Gastineau Channel about 6 miles from Stephens Passage. A watchman and a few families reside here.

Douglas (pop. 1,042; P.O.) on the southwest side of Gastineau Channel, about 6.5 miles from Stephens Passage, is a residential center. The wharf of an inactive cannery is in poor repair. A highway connects with Juneau by way of the bridge.

Juneau Isle, a small rocky promontory opposite the south edge of Douglas, is connected to Douglas Island by a roadway. A light is on the northeast end of the isle, and a tall white flagpole is near the southern end. The buildings on the isle are occupied by the U.S. Bureau of Mines.

The spit off the mouth of **Lawson Creek,** about 0.8 mile northwestward of Douglas, is marked by a light.

The rock dump of mine tailings, about a mile southward of Juneau, extends from the northeastern shore. Shoal water extending from the dump is marked by a lighted buoy. The orange and black radio tower of station KINY stands near the northwestern end of the rock dump.

Juneau (pop. 6,797; P.O.), a thriving modern city, is the state capital of Alaska. It is on the northeasterly side of Gastineau Channel, 8 miles north of Stephens Passage. Extensive hard-rock gold mining operations formerly were carried on, but since 1943 the mines have been closed. However, the mine buildings remain and are the most prominent features of the city, situated on the mountain slope above the southerly end of the business district. Juneau has several modern hotels and apartment houses, and numerous stores.

The Juneau-Douglas fixed highway bridge over Gastineau Channel at Juneau has a clearance of 50 feet over the central 200 feet of the 516-foot navigation channel center span.

Channels.—The approach to Juneau from the southwestward through Gastineau Channel is clear and deep. The draft of the deepest vessel calling at Juneau in 1959 was 30 feet.

Anchorage.—There are no prescribed anchorages at Juneau, but anchorage is available off the wharves, northeastward of the cable area, in 16 to 18 fathoms, soft bottom.

Dangers.—Shoals extend off the mouths of the creeks and are, for the most part, marked. In navigating Gastineau Channel do not approach the shores too closely, especially the southwestern shore. Stream flats and deposits from mine tailings extend well offshore.

Tides.—Daily tide predictions for Juneau are given in the Tide Tables.

Currents.—In Gastineau Channel the current floods northwestward past Juneau with a velocity of 2.0 knots. For daily predictions, see the Tidal Current Tables.

Winds.—Southeast gales may occur in the vicinity of Juneau at any season, but they are much more fre-

quent in winter than in summer. They are usually accompanied by rain, but not always by mountain squalls. The strongest winds are in the winter and are locally called **"Taku Winds."** They draw down the mountain passes from northward in gusts with terriffic force. Their force is modified somewhat under the lee of the highland eastward of Juneau. The southeast winds in summer seldom blow home, and when they do the confined channel admits but little sea.

Quarantine.—The U.S. Public Health Service maintains an outpatient office at Juneau; quarantine services are provided.

Customs.—Juneau is a port of entry and marine documents are issued.

Immigration.—There is an immigration office at Juneau.

Wharves.—Several wharves front the business district between the mine-tailing rock dump on the south and the flats of Gold Creek on the north. The principal ones have depths of 23 to 42 feet along the face. About 0.5 mile southeastward of the highway bridge is the Government wharf, which is shared by the Coast Guard and the Fish and Wildlife Service. There is a 30-ton sheerleg crane on the wharf. Immediately westward is the long T-head trestle pier of the Standard Oil Company. The Union Oil Company wharf is on the north side of the mine dump at the southeast end of the harbor. The Alaska Steamship Wharf is on the northeast side of the harbor about 0.2 mile east of the Government Wharf. The City Float is between the steamship wharves.

A small-boat basin used as an operating base for commercial fishing is just north of the Juneau-Douglas Bridge on the Juneau side of the channel. A Federal project provides for a basin dredged to a depth of 12 feet and protected by two rock-mound breakwaters. In 1958, the controlling depth in the basin was 10 feet. The entrance is marked by lights. In the basin are finger piers and floats. Gridirons are available for hull repairs.

Supplies.—Marine hardware in limited quantities and provisions of all kinds are obtainable. Diesel oil, gasoline, and fuel oil can be obtained from the oil companies. Fresh water is available at several wharves, and lumber at a sawmill.

Repairs.—A 15-ton crane and several machine shops are available. Information about marine railways in Alaska is given in Chapter 3.

Communication.—Juneau has frequent communication by steamer with Seattle, British Columbia, and the more important southeastern Alaskan ports, and by small craft with other ports in southeastern Alaska. Daily scheduled air service operates to Seattle, Anchorage, Ketchikan, and all other southeastern ports. Airplanes are available by charter to all non-scheduled southeastern Alaskan points. Cable and radio communications may be had to Seattle and Alaskan ports, and local telephone service to all Gastineau Channel ports. The local commercial broadcasting stations are KINY, KINY (TV) and KJNO.

Stephens Passage continues northwestward from Point Arden for about 22 miles to a junction with Saginaw and Favorite Channels. **False Arden** is a prominent point 1 mile westward of Point Arden.

Douglas Island, between Stephens Passage and Gastineau Channel is large and wooded. It has several prominent peaks ranging in height from 2,500 to 3,500 feet. The southern shore of the island is fairly bold and steep-to and can be followed at a distance of 0.3 mile.

Point Tantallon, a timbered point with a rocky beach, is at the southeastern extremity of Douglas Island. **Icy Point** is 0.6 mile westward of Point Tantallon.

Point Hilda, the western point of a large bight, is about 8 miles to the westward of Point Tantallon. **Point Hilda Light (58°13.1′ N., 134°30.3′ W.),** 20 feet above water, is shown from a small white house on the point. There is good anchorage and shelter from northerly weather 1 mile eastward of the light in depths of 6 to 15 fathoms.

Inner Point, marked by a daybeacon, lies 2.8 miles westward of Point Hilda. A lighted buoy marks the outer extremity of a shoal which extends 0.2 mile off **Middle Point,** 4.3 miles westward of Point Hilda.

Chart 8202.—Oliver Inlet has its entrance on the south side of Stephens Passage about 5 miles westward of Point Arden, through a narrow channel 1 mile long and 200 yards wide. The inlet is accessible only at high water to boats and small craft, the narrow entrance being barred at low water by a natural dam of rocks, over which the water pours like a waterfall except at slack water. At high-water slack, small vessels drawing not over 6 feet can enter. The currents in the entrance have a velocity of 6 to 8 knots, forming heavy swirls. A portage about 0.5 mile long connects this inlet with the head of Seymour Canal.

Chart 8235.—Point Young is 12 miles westward of Point Arden. The extremity of the point is grass-covered and has a pebble beach. From the point the land rises in a timbered ridge with a long gentle slope in a southeasterly direction. A low, rocky cliff, fringed by a kelp patch 40 yards offshore, extends about 0.2 mile westward from the point.

Admiralty Cove lies on the south side of Stephens Passage westward of Point Young. It does not afford anchorage except for small craft on account of shallow water. A small vessel can anchor in the cove southward of the island on the southwest side of Admiralty Cove, in 8 to 9 fathoms, mud bottom. This is a favorite anchorage for small craft but is open to westerly winds. A conspicuous trail-marker on the southeastern shore marks the end of a good trail maintained by the Forest Service. The trail extends 4.5 miles to **Admiralty Lake,** and is much used by trout fishermen and hunters in season. A shelter cabin is on the beach near the end of the trail, and another is on the shore of the lake.

A long narrow sand beach fronting a large tidal marsh is at the head of the cove, into which empties **Admiralty Creek,** a swift shallow stream.

Young Bay is the broad bight in the southern shore of Stephens Passage westward of Point Young. **Scull Island,** a grass-covered rock 53 feet high with deep water around

it, lies in the middle of the entrance. A rocky shoal with a least depth of 1½ fathoms lies 300 yards southward of Scull Island. A good foot-trail maintained by the Forest Service extends from the northeast side of Young Bay to the shore of Hawk Inlet. The cliff on the eastern shore about midway between the head of the bay and Point Young is marked by a light-colored scar 60 feet high and 30 feet wide.

Anchorage with shelter from southeast winds can be had about 0.5 mile from the southeast side of the bay, between Point Young and the head, in 18 to 22 fathoms, soft bottom. Small vessels may anchor closer inshore in desired depths.

Horse and Colt Islands, connected at low water, are wooded. **Colt Island,** the northerly one, has ledges on its northern, eastern, and northwestern sides. The northern point of Colt Island appears as a separate islet about 20 feet high, but forms a part of the island at all stages of the tide.

Horse Island, the larger and southernmost of the two islands, has shoal ground extending about 0.2 mile off the south shore of the island and practically continuous rock ledges extend from the southern tip of the island in a south-southeasterly direction across the entrance of a cove southwestward of the island. A fair anchorage for small boats is had in this cove but its use is not recommended due to the obstructions across the entrance. The best water for entering the cove from the southeastward lies just north and close to a part of these ledges which uncover 7 feet about 0.6 mile 150° from the south end of Horse Island.

A fair anchorage for small boats with protection from southerly winds can be had in midchannel west of Colt Island in 12 to 15 fathoms, mud bottom. Anchorage should be approached from the north, avoiding the ledge and rock which uncover 10 feet, north-northwestward of Colt Island, and the various small ledges and rocks near the shores.

Horse Shoal, about 0.8 mile eastward of Horse Island, consists of two patches 0.5 mile apart, both of which bare at half tide.

Shaman Island, 0.2 mile to the northward of Outer Point, is wooded, and is connected with Douglas Island by a gravel bar. There is a rock awash, 0.1 mile off the north end of the island.

Dornin Rock, with 2¼ fathoms over it, lies 0.4 mile westward of Shaman Island. **George Rock,** lying nearly 1 mile north-northwestward of Outer Point, covers at highest tides. It is marked by a light.

Fritz Cove, northeastward of **Outer Point,** the northwestern extremity of Douglas Island, affords anchorage and shelter from southerly and easterly winds.

Entrance Point, at the east end of Fritz Cove, is a wooded knoll connected with Douglas Island by a low spit. Northward and westward of Entrance Point is the **Gastineau Channel Flat.** Juneau Airport has been built on filled ground on the Gastineau Channel Flat at the mouth of **Mendenhall River.**

Gibby Rock with ¼ fathom over it about 0.7 mile 252° from **Spuhn Point,** the south end of **Spuhn Island,** is marked by a daybeacon. To enter Fritz Cove, pass on either side of George Rock and follow the shore of Douglas Island, giving it a berth of 0.2 mile. Anchor about 400 yards from shore and 0.4 mile southwestward of Entrance Point in 20 to 25 fathoms, soft bottom.

Auke Bay lies northward of Fritz Cove. After passing 0.2 mile southward and eastward of **Coghlan Island,** enter the bay on a northeasterly course with the summit of the island astern.

Old Auke Village is on the shore of the bay to the eastward of **Point Louisa,** near the entrance, and to the westward of **Indian Point.** Auke Lake lies about 0.3 mile back from the shore at the head of the bay. **Auke Bay** (P.O.) and a number of homes are in this area. A church and additional houses are being built. A highway runs from Auke Bay past the Juneau airport to Juneau. **Mendenhall Glacier** is about 2 miles inland, and a road running from its face joins the Auke Bay-to-Juneau highway.

Anchorage for small craft, with protection from southeast winds, may be found at the head of Auke Bay. On the northwest side at the head, a Standard Oil marine fuel station is at Taylors pier, which is marked by a light. A general store is at the pier. Food, gasoline, fuel, lubricating oils, and fresh water are available. The Union Oil Company also has a marine service float at the head of the bay. On the northeast side of the bay at the head, there is a Forest Service float landing, which is marked by a light. A biological laboratory operated by the Bureau of Commercial Fisheries is located here. Another general store is at the road intersection near the Government float.

Portland Island is a high wooded island at the junction of Stephens Passage with Saginaw and Favorite Channels. A reef, covered for the most part at high water, extends 0.7 mile northwestward of the island where it is marked by a buoy. **Portland Island Light (58°20.8′ N., 134°45.0′ W.),** 28 feet above the water, is shown from a small white house on a bare rock near the middle of the reef.

Chart 8302.—Saginaw Channel connects Stephens Passage with Lynn Canal and separates Mansfield Peninsula, the northwest end of Admiralty Island, from Shelter Island. This channel is used by vessels going from Stephens Passage to Chatham Strait or Icy Strait.

Symonds Point, the south point at the entrance to Saginaw Channel, is low and wooded; it rises with a gradual slope to Lone Mountain.

Lone Mountain, Mount Robert Barron, and the low divide between them, are conspicuous landmarks on **Mansfield Peninsula.**

Shelter Island, off the northwest point of Admiralty Island, at the northwestern end of Stephens Passage, is timbered. A dome-shaped peak on the northwest part of the island forms an excellent landmark when coming down Lynn Canal. The southeastern part of the island

is a long ridge. Reefs extend off the northwest end of the island for about 0.5 mile. A light, 19 feet above water, is shown from a small white house on the east side of the south end of the island. About 0.2 mile northwestward of the light a spur makes offshore for about 300 yards.

Strauss Rock, 0.5 mile southward of the southeast end of Shelter Island and marked by a buoy, has 2 fathoms on it. It is of small extent and dangerous. Sunken rocks and broken ground are between Strauss Rock and the southeastern end of Shelter Island.

Adams Anchorage, off the southeast end of Shelter Island and northwestward of Strauss Rock, offers good anchorage in 11 fathoms and very good anchorage for small craft in less depth, close to the shore during northerly weather.

Favorite Reef, in the southeasterly part of Saginaw Channel, bares at half tide and is marked by a light on the southern part of the reef. The reef lies about 0.3 mile from the Shelter Island shore, with a deep channel between, which is seldom used, as it is partially obstructed at its southeast end by a reef which uncovers 6 feet and extends out nearly 0.2 mile from Shelter Island.

Barlow Point lies about 3 miles northwestward from Symonds Point. **Barlow Islands** extend about 1.5 miles in a north-northwesterly direction from Barlow Point.

Barlow Cove is on the eastern side of the northern end of Mansfield Peninsula. A light on Point Retreat marks the western point of the entrance and the Barlow Islands form the eastern point of the entrance. The waters throughout the cove are deep. Anchorage may be obtained 0.2 mile from the southeast side at the head, in 22 to 23 fathoms, soft bottom.

In entering, favor the Barlow Islands to avoid the foul ground which extends about 0.2 mile offshore southeastward of Point Retreat. There is a narrow passage between Barlow Point and the Barlow Islands through which 20 feet can be carried, but it is unfit for vessels and is filled with tidal eddies and swirls except at slack water.

Faust Rock, in Saginaw Channel 1.1 miles from Barlow Islands and in line with them, is of small extent, has 2¾ fathoms over it, and is marked on the north side by a lighted buoy. It can be passed on either side.

Favorite Channel connects Stephens Passage with Lynn Canal northward of Shelter Island. It is the channel used by vessels going from Stephens Passage to upper Lynn Canal points, and Skagway.

Lena Cove lies on the eastern shore of Favorite Channel northward of Point Lena. It affords a southeast lee, but the bottom is rocky and it is not a good anchorage. Rocks awash lie close to the northern shore, northward of the northern point of the entrance.

Point Lena, the southwestern point at the entrance, is low and wooded. Rocks awash lie about 100 yards from the north shore of the point. The wreck of the SS PRINCESS KATHLEEN lies in 20 fathoms about 100 yards westward of the point. In 1953 it was reported that tne minimum depth over the wreck was 40 feet at low water.

A **special anchorage area** has been prescribed in Lena Cove and Favorite Channel between Point Lena and Point Louisa; for limits and regulations, see § **202.129,** Chapter 2. The outer limits of the area between Point Lena and Point Louisa are marked by two buoys.

Tee Harbor, on the eastern side of Favorite Channel, 1.5 miles northward of Point Lena, affords anchorage in the middle just within the points at the entrance in 12 to 14 fathoms. During southeast weather, williwaws at the entrance, at times, are severe. Small craft avoid these by anchoring in 6 to 9 fathoms at the southern end of the southern arm close to the beach. A road connects with Juneau. A sunken rock of small area with 1 fathom over it and marked by a buoy, lies 0.2 mile northwestward from **Point Stephens,** the southern point of the entrance. **Tee Harbor Light (58°25.7′ N., 134°45.9′ W.),** 33 feet above water, is shown from a white skeleton tower on the northern point of the entrance.

Cohen Islet lies about 0.9 mile northwestward from Point Stephens. It is timbered on the northern end, bare and rocky on the southern end, and has two rocks awash, close to the northwestern shore.

Aaron Island, 1 mile eastward of the middle of Shelter Island and 2 miles northwestward of Tee Harbor, is wooded. A grass-covered rock, 35 feet high, lies 200 yards northwestward from Aaron Island with which it is connected by a reef at low water. A shelving ledge, largely covered at half tide, extends 0.2 mile southward from the southern end of Aaron Island.

Cohen Reef, awash at high water, lies about 0.6 mile southeastward of the south end of Aaron Island.

Eagle Reef, about 1.2 miles northward of Aaron Island, is awash at highest tides. A rock, 7 feet high is on the north end of the reef.

Bird Island, 2 miles eastward of the northern extremity of Shelter Island, is sparsely wooded.

Gull Island, about 0.8 mile northward of Bird Island, is wooded. Reefs extend off the south point and the southwest shore for about 250 yards and for about 100 yards off the east shore. A small islet lies close to the north end of Gull Island.

Eagle Harbor, east of Bird and Gull Islands, affords anchorage in moderate weather. Good holding ground is found in depths of 14 fathoms near midharbor. Small craft find good anchorage in the small landlocked cove in the southeast corner of the harbor.

10. CHATHAM STRAIT

Chart 8002.—**Chatham Strait** is the most extensive of the inland passages of southeastern Alaska. It is 18 miles wide at its entrance between Cape Ommaney and Coronation Island and 14 miles between the cape and the west shore of Kuiu Island, with a length of 138 miles from Coronation Island northward to Rocky Island. The main strait is clear, open, and deep throughout but some of the bays and bights are foul. In the winter ice forms in many of the bays and inlets, particularly those into which large fresh-water streams empty and which have narrow entrances. The west shore as far as Point Augusta is high, bluff, and rugged, and free from hidden dangers in the way of navigation from point to point, except in the vicinity of the easterly entrance to Peril Strait. The water is shoaler on the eastern side and the reefs extend out farther, but in most cases they are in the bights and bays, and in no case do they extend beyond a line drawn 0.5 mile off from point to point, except a ledge about 1 mile offshore at Point Crowley.

Soundings are not a sufficient guide in these waters in thick weather, 20 and 30 fathoms being frequently found within a few yards of the shore, while 0.2 mile from the shore, 100 to 200 fathoms are not at all unusual. An almost universal feature is the occurrence of flats, with one or more small streams, at the head of all bights and inlets. The slope, from 8 to 10 fathoms to a few feet, is abrupt, and in approaching the head of an inlet at high water, care should be exercised in anchoring to give the flats a sufficient berth to avoid grounding at low water.

Boundary lines of inland waters.—The lines established for the waters of southeastern Alaska are described in **§ 82.275**, Chapter 2.

Weather.—The wind generally draws through Chatham Strait parallel to its axis, but if from northeast, will come down Frederick Sound and be felt in heavy squalls through the divides in the mountains on the east side. It sometimes draws through Tenakee Inlet and Peril Strait if blowing strong northwest outside. Most of the west shore is so high and bluff that the strong southwest winds cannot blow down into the strait, but draw around Cape Ommaney and northward through the strait, usually bringing fog and rain as far as Point Gardner.

Currents.—The flood current enters Chatham Strait at the southerly entrance between Cape Ommaney and Cape Decision and sets northward entering Frederick Sound, Peril Strait, and other bodies of water. The flood from the north enters the strait from Icy Strait. The two meet in the vicinity of Point Hayes and South Passage Point. On the ebb, the directions are reversed. The average velocity of the current is between 1.0 and 2.0 knots with an estimated maximum velocity of 3.5 knots. Strong tide rips are found around the various points, sometimes extending a mile or more into the strait when the current is strong. These are dangerous for small, open boats, especially at points surrounded by broken ground. Sometimes they will be encountered well offshore without apparent cause.

Along the east shore from Cape Decision to Point Crowley, a strong northwesterly set has been noted during the flood. During the ebb the current in the opposite direction is weak, and very often there is a northwest eddy. The current seems to travel along the shore in definite streams. The outer limit of the current stream is marked by drifting material, and the difference in current on either side can be noted. It appears that the flood current travels from the sea toward and up the east shore of the strait and that the ebb is strongest on the west side.

For daily predictions for places in Chatham Strait, see the Tidal Current Tables.

Chart 8252.—In approaching Chatham Strait from seaward, Hazy Islands are distinctive from their position and form a good landmark when they can be seen. They are also sometimes useful for fixing the position when it is thick inshore. The passage between them and Coronation Island is clear. Cape Ommaney is high and an important landmark. The summit back of the cape appears as a rounded knob with gentle sloping shoulders which drop steeply to the water's edge. In approaching from the westward in thick stormy weather, there is a possibility of mistaking the high land northwestward of Larch Bay for that edge of the cape.

Local magnetic disturbance.—Differences of as much as 6° from normal variation have been reported in Chatham Strait in midchannel between latitudes 57°15′ N., 57°23′ N.

From Sumner Strait, vessels enter Chatham Strait between Cape Decision and the Spanish Islands. Very dense fog at times has been observed in the southern part of Sumner Strait which extended about 1 mile to the westward of Cape Decision beyond which it was clear. Approaching from the southward, it is suggested to make Coronation Island and pass between it and Hazy Islands. In thick weather, should Coronation Island not be sighted, a sharp lookout should be kept for Hazy Islands. Whistle echoes along the Coronation Island coast on either side of Windy Bay have usually been found sharp and distinct. The current sets northwest along the coast, with an estimated velocity of 1 knot, depending on the wind, and should Coronation Island not be sighted a vessel may be set toward Cape Ommaney. There are several dangers off the northern side of Coronation Is-

land. When once in Chatham Strait the navigation is easy, for it is wide and comparatively clear, with fair steamer anchorages at short distances.

Cape Decision radiobeacon will be of great assistance to vessels equipped with a radio direction finder in making the entrance to Chatham Strait.

Hazy Islands form two distinctive groups about 8 miles westward of Coronation Island, and are separated by a channel 1.2 miles in width and depths of 25 to 40 fathoms. The northwestern group consists of three prominent islets, the largest of which, **Big Hazy Islet,** is conical in shape. The second largest of this group, about 0.3 mile northwestward, has three sharp, well-defined summits. The smallest of the group consists of two jagged rocks which are connected at low water but appear as one islet with two summits.

The southeastern group is low. The northern islet of this group has two grassy knobs and a very sharp pillar-shaped knob. Off the southeastern side of this islet are two rocks, close-to. The southern islet of this group is a very low rocky reef with a breaker about 300 yards off the south end of the islet.

Hazy Islands are a National Wildlife Refuge under the jurisdiction of the U.S. Fish and Wildlife Service.

In navigating in this section in thick weather, the northern group of islets can usually be seen in time to avoid trouble, but the southern group is dangerous. Although the lead gives evidence of shoaling, it is very slight until within less than 0.5 mile of the islets.

Currents are irregular. The coastal currents near the islands appear to set northwesterly with a velocity of about 1 knot, but in the vicinity of the islets the currents seem to be modified by the branch from Chatham Strait. Currents with a northerly set and a velocity of about 1 knot were found 5 miles northward of the Hazy Islands.

Cape Ommaney, the western point at the entrance to Chatham Strait, is a remarkable promontory terminating in Ommaney Peak, a bluff, rugged, rocky mountain, detached from the higher land northward by a low depression running through from Port Conclusion. **Wooden Island,** sparsely wooded, is close southeastward of Cape Ommaney.

Cape Ommaney Light (56°09.6′ N., 134°39.6′ W.), 190 feet above the water, is shown from a small white house on Wooden Island. This light together with Helm Point Light, Point Crowley Light, and Cape Decision Light mark the approach to Chatham Strait.

Chart 8173.—From Helm Point to Windy Bay the shoreline of Coronation Island is rugged and rocky, with steep brown and yellow cliffs. In the bight westward of Helm Point is a rock awash. Between Helm Point and Windy Bay are off-lying rocky islets, the outermost of which is 1.3 miles 276° from Helm Point and about 0.5 mile offshore. It is of grayish color, without vegetation, with deep water close-to, and is generally visible in moderately thick weather.

Windy Bay, on the western side of the island, is well protected from the sea by rocks and reefs which extend from the north shore of the entrance to within 0.3 mile of the south shore. A line of breakers usually shows on the reefs.

The shoreline of the bay is rocky. At the head of the bay is a sand beach about 350 yards long and a deposit of sand is near the mouth of the stream on the southern side of the bay.

The depression in which the bay lies is readily distinguished from offshore, although the surrounding peaks are high. From offshore, Windy Peak is a good landmark. The entrance is southward of the reefs. Follow the general trend of the southern shore about 0.2 mile off. When approaching the south inner point where the bay narrows, change course so as to pass about 220 yards off the point; beyond, the bay is clear. Depths of 15 to 20 fathoms are carried through the channel.

Anchorage may be had in 22 fathoms, mud and sand bottom, off the stream on the southern side of the bay or near the head, but swinging room is restricted. The stream may be identified by the grassy area near its mouth. Fishing boats and other small craft may anchor in shoaler water closer in. During southeast gales the wind is felt with considerable force, and the depths throughout the bay, averaging about 30 fathoms, mud bottom, are too great for secure anchorage.

From Windy Bay to Nation Point, the northwestern point of the island, the shoreline is rocky and rugged. Off the rounding point, about 1.8 miles to the southwestward of Nation Point, are two rocks about 300 yards offshore; the southern rock shows breakers in moderate weather, the northern rock bares. A rock, which uncovers about 4 feet, is 0.3 mile northward of the two rocks.

Nation Point, at the northwest end of Coronation Island, is rocky, with breakers close-to on the western side. Depths of 16 to 40 fathoms were obtained 0.3 mile from the point. The land rises rather steeply at first, then with a gradual slope to Pin Peak.

From Nation Point to Cora Point, the shoreline is cut up by numerous bays and inlets, the principal ones being Egg Harbor and Aats Bay, both affording anchorage. **Aats Point,** about 2.3 miles to the eastward of Nation Point, is a prominent rocky point. The land rises in a timbered ridge of moderate slope.

Local magnetic disturbance.—Differences of as much as 3° from normal variations have been observed at Aats Point.

Egg Harbor lies on the eastern side of Nation Point, directly under Pin Peak. It is a secure anchorage, except from northerly winds. The shoreline halfway to the head of the bay is rocky, beyond which it is sandy. About 0.5 mile within the entrance, on the western shore, are caves about 30 feet high, two shacks, and a white boulder beach which can usually be picked up at night. A trail leads from this place to near the summit of Pin Peak, where mining operations were formerly carried on.

A rock, which bares, is 0.2 mile off the western point of the entrance. Kelp extends from the shore to about 20 yards beyond the rock. In entering the bay at night this rock is the main danger, as it can seldom be picked up and usually does not show as a breaker.

Off the eastern point of the entrance is a rock about 10

feet high. About 160 yards to the northwestward of this rock is a rock awash at high water.

The channel between the rocks off the point is about 500 yards wide; and a midchannel course leads to safe anchorage in 5 to 7 fathoms, sand bottom. During southeast gales, williwaws sweep down with considerable force, and heavy ground tackle is necessary to prevent dragging. On the east side of the bay, halfway to the head, is a small bight used by fishing craft, as it affords better protection. Near this place is a low portage to the bay to the eastward.

Alikula Bay, eastward of Egg Harbor, is free of dangers and anchorage can be selected according to size of vessel in either the outer or inner part of the bay.

Aats Bay, eastward of Aats Point, has two arms. The western arm is too deep for secure anchorage; the eastern arm affords anchorage in 6 to 8 fathoms, sand and mud bottom. There is a 1½-fathom rock marked by kelp in the entrance of the eastern arm. At times there is a kelp patch about 200 yards to the southward of the rock. Favor the eastern shore in entering. During severe southeasterly gales, williwaws are felt with considerable force, and heavy ground tackle is necessary to prevent dragging. The bay is exposed to northerly weather.

Gish Bay is about 1 mile eastward of Aats Bay; and rocks, which uncover about 3 feet, are midway between the entrance points. The bay is full of kelp in which depths of 4 to 6 fathoms were found; shoal water extends 0.2 mile from its head. It is not suitable as an anchorage. **Channel Island**, a small islet with a few trees, is 0.5 mile offshore and marks the entrance to the bay. The islet shows up well from easterly and westerly and during moderately thick weather is a good landmark.

From Aats Bay to Cora Point the shoreline is irregular. Near Cora Point, on the northern shore, is **Shrub Islet**, a small rocky islet with a few trees on it. Southward of the islet is a small cove where small launches anchor in 5 to 10 fathoms.

Dangers.—The rocks off the southern end of Coronation Island are described under Helm Point. The most important dangers off the northern coast are as follows: A 2-fathom spot, which during heavy weather shows as a breaker, is 2.2 miles 017° from Nation Point; it is not marked by kelp. A rock which uncovers 8 feet, is 1.1 miles 347° from Aats Point. A very heavy breaker 0.2 mile southeastward of the rock was occasionally observed during a severe gale, but the shoalest depths found were 7½ fathoms. A 6- to 8-fathom patch, marked by kelp during the summer, is 0.4 mile westward of the rock. A rock awash is 0.5 mile northeastward of Aats Point.

The channel between Coronation Island and the Hazy Islands is clear. Spanish Islands and Cape Decision are described in Chapter 7.

Chart 8252.—Point Howard, about 5 miles northwestward of Cape Decision, consists of a detached rocky ledge back of which several bare mountain peaks, including **Mount McArthur**, are grouped.

Howard Cove, between Cape Decision and Point Howard, is open to the westward and is not considered a secure anchorage. The temporary use of the cove is recommended only for small craft of not over 6-foot draft with local knowledge.

Crowley Bight, a fair-weather anchorage, is an indentation in the shoreline between Point Howard and Point Crowley. It is exposed and affords poor holding ground.

Point Crowley is a prominent headland on the eastern shore 8 miles northwestward of Cape Decision. Most of the higher peaks in this vicinity are bare. A group of rocks, which uncover about 5 feet, on which the sea breaks at practically all stages of the tide, is about 1 mile southwestward from the point. The passage between the rocks and the point may be used to take advantage of the prevailing northerly current when northbound.

Point Crowley Light (56°07.2′ N., 134°15.4′ W.), 45 feet above the water, is shown from a small white house on the point.

The north entrance point of **Table Bay**, about 2 miles north of Point Crowley, consists of an island close to a tongue of lowland, which affords some shelter from the swell in the north arm of the bay. Temporary anchorage may be had in 13 to 16 fathoms, mud bottom, favoring the west shore and taking care not to anchor too close to the rocks, awash at high water, off the north shore of the arm. In the northernmost part of the northern arm is a good place to beach a vessel in case of emergency. Fishing vessels generally anchor in the southeast arm of the bay. At high water small craft can enter the landlocked cove on the west side of the north arm passing between the wooded island on the north side of the cove and the rocky islet south of this island. At low water there are bare rocks in this entrance.

The entrance to Table Bay is marked on each side by bold, rocky bluffs which are very distinctive in color, those on the north side being dark while those on the south side are light and show prominently when in the sun. The low gap at the east end of the bay is prominent in contrast with the high land on either side.

Chart 8299.—Port Malmesbury is on the eastern side of Chatham Strait, 18 miles northward of Cape Decision. On the southeasterly side of the port are two arms; one about 1 mile inside the entrance and the other near the head. There is also a short arm on the westerly side about halfway between the entrance and the head of the port.

Point Harris, the north entrance point to Port Malmesbury, marked by a light, is a bare rocky platform, 40 to 50 feet high, extending 0.2 mile out from the tree line. Back of the point the land rises gradually at first and then more abruptly, to form a prominent detached peak. This mountain has a dark green growth of timber on the west slope and a large yellow landslide on the south slope.

One-half mile eastward of Point Harris is another prominent point. Its face is a steep bluff of light gray rock. The land rises abruptly here to form a small knob; the low land back of the knob rises uniformly to the first-mentioned peak. The knob is prominent from the northwesterly direction and is visible over Point Harris.

A reef extends about 350 yards off the point on the

northern side of the port about 1.2 miles inside the entrance. The bight west of this reef affords fair-weather anchorage, protected from northerly winds, in 15 fathoms, soft bottom.

The small arm on the north side has a narrow entrance channel with dangers on both sides. Vessels entering should favor the southern shore in the narrow entrance. Good anchorage is inside the arm in 7 to 10 fathoms, mud bottom.

The shore near the south entrance point is irregular and foul. The head of the first arm on the south side affords anchorage in 17 to 18 fathoms. Favor the west side near the head to avoid the 3¾-fathom shoal shown on the chart.

In the second arm on the south side, anchorage may be had in 7 to 16 fathoms, mud bottom. The channel to the basin at the head of this arm is narrow with 3¾ fathoms at its entrance, but can be entered by small vessels with safety.

Harris Cove, between Port Malmesbury and Gedney Harbor, extends nearly to the basin at the northwest end of Port Malmesbury, with low land between. This bight is used by small craft for anchorage in all but westerly weather.

Point Cosmos is about 3.5 miles northward of Point Harris. It rises by several broad terraces to a bare-topped mountain. At Point Cosmos the shore trends northeastward for nearly 2 miles to the entrance of Gedney Harbor.

Chart 8271.—Gedney Harbor has its entrance on the eastern side of Chatham Strait 2 miles northeastward of Point Cosmos. The harbor is a horseshoe-shaped cove, averaging about 0.2 mile in width, which surrounds a wooded island over 1 mile long. The passage eastward of the island is blocked at its northern end by rocks and reefs.

The entrance to the harbor is on either side of a ledge about 400 yards long lying less than 0.2 mile west of the island. The northwest and southeast ends of the ledge are bare heads which show but few feet above the highest tides. The channels on each side of the ledge are clear in midchannel. About 0.3 mile southeast of the ledge the passage southwestward of the island is narrowed to a width of 200 yards by a sharp point projecting from Kuiu Island. Kelp and shoal water extend about 50 yards off the point.

A fish buying scow is anchored in the harbor from May 1 to September 20. All supplies for fishermen, including food, fresh water, and fuels, are available. There is a float 280 feet in length with 5 fathoms alongside. The harbor is used extensively by fishermen during season. Anchorage is available in most parts of the harbor in 6 to 12 fathoms, mud bottom.

Tebenkof Bay is on the eastern side of Chatham Strait just north of Gedney Harbor. Its entrance is between Point Ellis on the north and **Swaine Point** on the south. The bay extends inland for about 7 miles and branches into 3 arms of irregular shape. The high regions north and south of the entrance merge into the low-lying hills that cover the entrance islands and the long projecting points of the bay. The islands inside the bay and the east shore are low and a distinctive feature of the locality. Fox farms have been established on some of the islands but they are the only commercial development in the bay.

Windfall Islands are 3 islands lying from 1 to 2 miles northward of Swaine Point. **Troller Islands** are 6 islands just northeastward of Windfall Islands. They are separated from Kuiu Island by **Helianthus Passage,** a narrow passage obstructed by a 2-fathom rock near midchannel at its south entrance. There are strong currents in this passage during spring tides. **Troller Point** is the most northerly point of the Troller Island group.

From some distance offshore in Chatham Strait the Windfall and Troller Islands appear as a continuous stretch of shoreline.

Davis Rock is a bare rock in the entrance to Tebenkof Bay, about 1 mile northwestward from Troller Point. It forms an excellent landmark for entering the bay. Southwestward from the rock are a number of shoals and submerged pinnacle rocks as shown on the chart. A rock, 15 feet high, similar to Davis Rock in appearance, is off Troller Point.

Explorer Basin lies between Kuiu Island and the offlying Windfall and Troller Islands. It affords fair anchorage during southerly weather. The entrance is obstructed by shoals off Swaine Point and the southernmost Windfall Island.

Thetis Bay, the south arm of Tebenkof Bay, affords excellent anchorage near its head in 9 to 10 fathoms, mud bottom.

Local magnetic disturbance.—Differences of as much as 4° from normal variation have been observed on the west shore of Thetis Bay at 56°25.7′ N., 134°10.3′ W.

The entrance to **Petrof Bay,** the southeasterly arm, is endangered by numerous reefs and shoals. The northern side of the entrance channel is marked by **Tebenkof Bay Light (56°27.0′ N., 134°08.2′ W.),** 14 feet above water, shown from a small white house on a small island on the east side of the entrance. A daybeacon is on a rock awash, 1.7 miles 144° from the light.

Good anchorage can be selected in various parts of Petrof Bay; the chart is the best guide.

Piledriver Cove is a small cove on the north side of Tebenkof Bay, 4 miles eastward of Point Ellis. A number of dolphins have been established in the cove for use in mooring pile drivers.

Happy Cove, on the north side of the bay 3 miles eastward from Piledriver Cove, is well sheltered. Its entrance is marked by two islands, one bare and one wooded. The inner cove, separated from the lower part by a narrow channel, has sand bottom and beach. It is much used by fishermen for beaching their vessels.

Gap Point is the southernmost extremity on the north shore of Tebenkof Bay about 1.5 miles southeastward from Happy Cove. From the entrance to Tebenkof Bay, it is distinguished by the gap between the islet south of it and the point.

Elena Bay, the north arm, affords good anchorage at various places.

Directions.—The entrance north of Davis Rock is clear

and may be navigated easily with the aid of the chart. In approaching this entrance from southward, care must be taken to avoid the dangers southwestward of Davis Rock. Small craft can enter the bay via Explorer Basin and Helianthus Passage.

Chart 8241.—The bight which is the entrance to the Bay of Pillars and to Rowan Bay is about 7 miles wide at its entrance between Point Ellis and Point Sullivan and indents the coast 2.5 miles in its main part. The two bays have secure anchorages. There are many islands, rocks, and reefs in the bight, especially between the two arms, but a deep channel leads into each arm.

Point Ellis, the south point of Bay of Pillars, is 17 miles northward of Point Harris. The point is low and rocky, with a high wooded ridge rising steep and bluff back of it, having two prominent landslides on its southern face, the easterly one being inverted "V" in shape. These slides are bare and can be seen for long distances from south or southwest. A bare reef is 0.6 mile northwestward of the point, with kelp between. A rock has been reported 0.4 mile northward of the reef. Kelp extends 0.5 mile northward from the reef, and is marked at its extremity by a lighted bell buoy. A temporary anchorage can be had about 0.2 mile from shore northward of Point Ellis in 10 to 12 fathoms, rocky bottom.

Bay of Pillars extends about 10 miles northeastward from Point Ellis, and is comparatively clear for 4.5 miles, or 1 mile above the cannery. Above this the bay is foul and must be navigated with caution.

A saltery plant and abandoned cannery are on the southeast side of the Bay of Pillars about 3.5 miles above Point Ellis. The saltery wharf has a face 120 feet long with a depth of 19 feet at the southwest corner, gradually increasing to 34 feet at the northeast corner. It is reported that a rock on which there is from 4 to 5 feet, lies about 30 feet beyond the southwest corner and constitutes a danger should a vessel swing its bow inshore of the line of the face of the wharf.

The cannery wharf has a face 165 feet long, with a depth of 20 feet at the south corner, gradually increasing to 24 feet at the north corner.

Large vessels usually make a port landing at the saltery plant and wharves.

Anchorage can be had 300 to 400 yards northward of the cannery in 12 to 20 fathoms, but the bottom drops off abruptly, and care should be taken at high water to keep off the flat which extends 250 yards from the mouth of the stream northeast of the cannery.

Four small islands are on the southeast side of the bay 1 mile above the cannery, and a secure anchorage for small vessels is about 400 yards eastward of them and the same distance from the southern shore, in 10 to 11 fathoms. It is safer for a stranger to enter at low water. The channel is about 200 yards wide between the northern end of the islands and a reef.

About 6 miles above the entrance a narrow foul channel leads into the inner bay which is clear and deep. There are strong tidal currents in the narrow entrance to the inner bay and it should only be entered at slack water.

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Anchorage can be found in the cove to the south just before entering the inner bay in 10 to 4 fathoms, mud bottom, and good anchorage in 2 to 7 fathoms, mud bottom, is found in any part of the arm leading to the south at the head of the bay.

Rowan Bay has a very irregular bottom and much kelp and is suitable only for small vessels. Strangers should preferably enter at low water and exercise care.

A shoal of small extent, with a depth of 4 fathoms and deep water around it, is about 0.8 mile southwestward of the narrow entrance to Rowan Bay. It is marked by kelp.

The entrance to Rowan Bay, 5 miles northward of Point Ellis, has depths of 10 to 20 fathoms and foul shores. At 1.2 miles within the entrance there is an island in the middle and irregular bottom and kelp nearly across. The deep channel follows the southwest and southeast sides of the island at a distance of about 200 yards. The passage northward of the island has kelp across it and much foul ground.

Northward of this island the arm has a northerly direction with depths of 6 to 12 fathoms, and is a secure anchorage. Two large streams enter the head, and an extensive flat borders the entire north shore between them to a distance of over 0.5 mile, but the shoaling is gradual up to 3 fathoms.

Point Sullivan is low and wooded. The land rises gradually back to a ridge. A chain of islands and bare rocks extend 1 mile southeastward from the point. Eastward of these islands is a bight in the middle of the northern end of which temporary anchorage, open southward, can be had in 13 to 15 fathoms.

Washington Bay is on the eastern side of Chatham Strait, 2.5 miles northward of Point Sullivan, and has deep water and high, steep sides. The entrance is not visible far from shore. **Washington Bay Light (56°43.0′ N., 134°23.1′ W.)**, 13 feet above water, is shown from a small white house on the inner point on the south side of the entrance. Rocks lie close to the northern point of the entrance, but the channel to the southward is clear.

A herring reduction plant is on the northern shore of Washington Bay, a little more than a mile from the entrance light. The wharf has a face 135 feet long, with depths of 30 feet and more alongside. Vessels usually make a port landing. Fresh water can be obtained on the wharf. The reduction plant operates a general store. Mail boats and planes stop here on regular schedule.

The head of the bay is not recommended as an anchorage on account of insufficient swinging room. In the winter the wind draws down the north side of the head of the bay with violence. There are no known dangers in the bay. If entering the bay the only directions necessary are to give the shores a berth of 100 yards.

Chart 8252.—Kingsmill Point is on the eastern side of Chatham Strait at its junction with Frederick Sound. It is marked by **Kingsmill Point Light (56°50.6′ N., 134°-25.1′ W.)**, 25 feet above the water and shown from a small white house. Frederick Sound is described in Chapter 8.

Chart 8261.—Breakfast Rock is about 0.3 mile off the western shore of Chatham Strait at a point 4 miles northward of Cape Ommaney. It is small in extent, bare, and has deep water close-to. There is a passage used by small boats with local knowledge, between this rock and the reef extending out from the shore.

Port Alexander, indenting the western shore of the strait about 5 miles northward of Cape Ommaney, is a small-boat basin with an entrance 150 yards wide. A channel 15 feet deep leads through ledge rock at the main entrance and a channel 2 feet deep at the entrance to the inner lagoon.

Port Alexander Light (56°14.4′ N., 134°38.9′ W.), 68 feet above the water, is shown from a small white house on a skeleton tower on the high bare rocky point at the south side of the entrance. A lighted range bearing **334°**, leads through the center of the entrance channel, and about 50 yards to the southwest of a buoy which is in 22 feet of water and marks the outer edge of a rock shoal.

Port Alexander (pop. 18; P.O.) a settlement with a general merchandise store, is on the east side of the harbor. There is a wharf with 12-foot depth at the face, and two floats for small craft. An oil company has a station here, and gasoline, distillate, and lubricating oils can be obtained. Galley coal, fresh water, provisions, fishermen's supplies, and some marine hardware can be obtained. A radio station is maintained during the summer months. Mail planes and boats call here on schedule. There is a grid for beaching small craft and minor repairs to machinery of vessels can be made.

To go to the inner lagoon pass close off the wharves, heading for the small wooded islet in midchannel to northward. When about 60 yards from the islet change course and pass in midchannel to eastward of the islet.

A speed limit of 3 miles per hour is prescribed for certain vessels in Port Alexander; for regulations see **§ 207.790,** Chapter 2.

Point Conclusion, 6.5 miles northward of Cape Ommaney, is low, flat, and wooded. The point is the northern extremity of the comparatively low peninsula lying between Port Alexander and Port Conclusion. A small island is close off the point. **Graveyard Cove** is an open bight on the south side of the point. **Flotsam Islet** is in the eastern part of the cove.

Port Conclusion has its entrance westward of Point Conclusion. The soundings are deep and somewhat irregular, but the port and approaches have been found clear of dangers. On the east shore of the port, 0.3 mile south of Point Conclusion, is a cove about 0.2 mile wide with a sandy beach at its head. About 0.5 mile farther southwestward, on the same shore, is **Ship Cove** where Vancouver moored his vessels. A few piles on the eastern side of the cove mark the site of a former saltery. The cove affords protected anchorage for small craft in 2½ to 4 fathoms. The only ship anchorage in Port Conclusion is in midchannel, about 0.3 mile northward of Ship Cove and southward of the 5¾-fathom spot, in 13 to 20 fathoms, rocky and uneven bottom. The holding ground is poor and its use is not recommended. **John Bay,** on the western side opposite Point Conclusion, is a deep bight of no importance.

A herring reduction plant is on the west side of Port Conclusion at its head. The wharf has a face 125 feet in length, with a least depth of 24 feet at the southern corner. Vessels make a port landing. Mail planes and boats call here on schedule.

Port Armstrong is 1.5 miles northward of Point Conclusion. **Port Armstrong Light (56°18.0′ N., 134°38.3′ W.),** 41 feet above the water, is shown from a small white house on the north point of the entrance. From **Point Eliza,** the south point at the entrance, a narrow ledge, which uncovers shortly after high water, extends eastward for about 200 yards in a continuation of the point. Vessels should keep about 0.5 mile offshore until abreast of the entrance.

A light on the north shore, about 0.5 mile within the bay, marks the narrowest part of a channel, with bold shores, leading to the inner landlocked basin of Port Armstrong. This basin affords the best anchorage in the vicinity. The anchorage is in the west end of the basin in 15 to 20 fathoms, soft bottom. A midchannel course carries in safely. All dangers are shown on the chart.

A herring reduction plant is on the north side of the basin at Port Armstrong, just within the narrows. The wharf has a depth of 24 feet alongside. Northeastward of the reduction plant is an abandoned whaling station. The reduction plant maintains a general store and radio station during the season. Mail boats and planes stop here on regular schedule. Vessels usually make a port landing at the wharf. On the ebb the wash of the current from the creek westward of the wharf has a tendency to set a vessel off the wharf. Fresh water, fuel oil, and diesel oil are piped on the wharf.

Miner Cove, about 0.8 mile northward of Port Armstrong entrance, is an open bight which might afford temporary anchorage for small craft.

Chart 8264.—Port Lucy has its entrance on the western shore about 10.5 miles northward of Cape Ommaney. The anchorage for large vessels is near the head, abreast a deep gulch on the west side, in about 20 fathoms. Small vessels can go farther in and anchor in about 10 fathoms. From the head of the port low land extends through to the western side of Baranof Island at Puffin Bay, and winds from those quarters may draw through in consequence but without any sea. The port is easy of access, and there are apparently no dangers.

Chart 8263.—Toledo Harbor is a small, horseshoe-shaped bay with depths of 3¼ to 8 fathoms, mud bottom, which lies 13 miles northward of Cape Ommaney. It is considerably used by small local fishing craft. It has an entrance about 75 yards wide with a midchannel depth of 5 fathoms. The northeastern part of the harbor is shoal.

Port Walter has its entrance about 14 miles northward of Cape Ommaney and 9 miles southward of Patterson Point. **Port Walter Light (56°23.3′ N., 134°38.1′ W.),** 20 feet above the water and shown from a small white

house, is on the south point at the entrance. Near the head of Port Walter, a little south of midchannel, is a wooded islet. A high-water rocky islet, from which a reef extends in a northerly direction into the channel, is 50 yards northward of the wooded islet. Anchorage in 14 fathoms, sandy bottom, can be made between the islet and the north shore. A vessel using this anchorage is liable to be in the way of ships entering Big Port Walter.

Little Port Walter, westward of the southern entrance point, consists of an inner and outer harbor with a narrow connecting channel. A flat, grass-covered rock and two wooded islets are on the western side of the entrance. The narrow channel, connecting the inner and outer harbors, has a width of about 30 yards with a depth of 3¼ fathoms and is subject to shoaling.

Vessels should enter between half and high tide only and preferably on a rising tide. They should pass along the southern side of the channel and make a slow turn to enter the inner harbor. Too sharp a turn may throw the stern into shoal water. The current in the entrance is estimated to be 1 knot.

Good protected anchorage for small craft can be had in the inner harbor in 6 to 8 fathoms, mud bottom. A creek enters the head of the harbor. Southwesterly winds draw down the creek and across the harbor, but no other winds are felt. The Fish and Wildlife Service has a float and laboratory in the lower end of the harbor. The laboratory and dwelling combined is a large white building which is prominent when entering Port Walter.

New Port Walter, a small cove with a stream at the head, is on the north side, about 1 mile from the entrance to Port Walter. The saltery and fertilizer plant in this cove are abandoned and the wharves are in ruins. The flat at the mouth of the stream extends to the inner end of the wharf ruins. A rock, bare at extreme tide, is close to the eastern point of this cove. A rock, bare at high water, is off the western point of the cove, with a reef extending part way from the shore.

Big Port Walter, a basin with depths of 25 to 50 fathoms, is entered through a narrow passage 0.5 mile long leading from the anchorage westward of the wooded islet. The northern point of the entrance is marked by a light. The passage is nearly straight, with a depth of 25 fathoms at its narrowest part. The maximum current in the entrance is estimated to be 2 knots. A large stream enters in the northern part and two streams empty in the southwestern part of the bay. One of the latter is a cascade from a lake about 800 feet high. The shores are steep-to, and there are apparently no dangers. The basin is too deep for good anchorage and freezes in winter. With an accumulation of snow the ice becomes 8 to 10 feet thick during the severe winters and lasts until the first of April.

A herring reduction plant is at the head of Big Port Walter. The wharf has a least depth of 35 feet alongside, and vessels make either a port or starboard landing as desired. Fresh water can be obtained on the wharf. A float for small craft is on the eastern side of the wharf. The reduction plant maintains a general store and radio station during the season. Mail boats and planes stop here on regular schedule.

Chart 8265.—Port Herbert has its entrance about 16.5 miles northward of Cape Ommaney and 6.5 miles southward of Patterson Point. The water is too deep for anchorage and there are apparently no dangers. There are no islets or rocks at its entrance, which distinguishes it from Port Walter.

Chart 8266.—About 4 miles northward of Port Herbert and 2.3 miles southward of Patterson Point is a small bight used for anchorage by local fishing craft during the summer months. A rock, covered at three-quarters tide, is reported to lie off the south point at the entrance.

Patterson Point, on the west side of Chatham Strait 23 miles northward of Cape Ommaney, is the north point at the entrance to Patterson Bay. It is high, bluff, and bold, and is the southern end of a high mountain ridge included between the north arm of Patterson Bay and Chatham Strait, extending northward to a series of high rugged peaks. The point is conspicuous from southward, Patterson Bay showing as a deep gulch in the high rugged mountains.

Mist Cove, about 1.4 miles southwestward from Patterson Point, is an open bight too deep for anchorage. A waterfall on the south side of the cove is visible from well northward in Chatham Strait.

Deep Cove has its entrance 1 mile westward of Patterson Point. A narrow peninsula makes out from the northern shore 2 miles within the entrance. A stream with a flat at its mouth empties at the base of the peninsula on its northern side. Another stream with a waterfall empties at the head of Deep Cove. Anchorage can be made near the small flat below this waterfall in 20 to 25 fathoms, soft bottom. The water in the cove is otherwise too deep for anchorage. In 1956 only pile ruins remained of the former reduction plant 100 yards northeast of the waterfall at the head of Deep Cove.

Patterson Bay has its entrance westward of Patterson Point. Constricted anchorage in 22 to 24 fathoms can be made below the wooded islet at the head and abreast a small green point on the west side formed by the debris from the cliffs above it. Several streams enter. No directions are necessary and there are apparently no dangers in the bay.

Chart 8242.—Gut Bay is on the west side of Chatham Strait, about 34.5 miles northward of Cape Ommaney. At 0.3 mile eastward of the narrow entrance and 300 yards from the south side is a rocky patch with 4½ fathoms; vessels should pass northward of it. The entrance is about 100 yards wide with bold shores. The sides are bluff, bold, and rocky, in some places almost perpendicular. On the south side, 2.5 miles from the entrance, is the narrow opening of a little bay, between high ridges, with a depth of ¾ fathom. Small craft can enter this bay at high water and anchor in about 3 fathoms.

The water in the main bay is deep, but a temporary anchorage can be had on the south side 0.5 mile within the entrance, off a rocky ledge and small stream, in about 20 fathoms, but it is not good, as the bottom is rocky,

and the wind draws through. A fair anchorage can be had near the head in 10 to 20 fathoms.

Hoggatt Bay is 2 miles northward of Gut Bay and extends back into the mountains of Baranof Island. The sides are steep and bold and the water deep, over 100 fathoms through the middle.

Red Bluff Bay is 4.5 miles northward of Hoggatt Bay and 9 miles westward of Kingsmill Point, and is named from the prominent rocky, red hills north of it, which come down to a low point on the north side of the entrance, and which with some small islands in the mouth, almost close it. A small white house, the structure of an abandoned lighthouse, is on the southeastern point of the southeasternmost island in the entrance. The bay extends back into the mountains. About the middle it chokes to less than 100 yards between high cliffs, but the channel is good. On the south side at the head is a large stream; a flat extends 0.4 mile from the head and 0.2 mile eastward from the mouth of the stream.

A small vessel may anchor just inside the entrance in the channel between the islands and the south shore. An anchorage can be had 1.8 miles from the entrance, where the bay begins to narrow, in 8 to 12 fathoms nearly in midchannel. The bottom is rocky. The wind sucks through strong when blowing in the strait. At the head, favoring the north shore and north of the flat at the mouth of the stream, is a good anchorage in 12 to 16 fathoms with soft bottom and perfect protection.

In the bight 0.5 mile northwestward of the westernmost island at the entrance are the ruins of a saltery and wharf. A reef extends from the shore about 100 yards to the westward. The outer end of the reef is bare at nearly all stages of the tide and should be given a berth of at least 50 yards.

Local magnetic disturbance.—Differences of 5° from normal variation may be expected in the channel entering Red Bluff Bay.

There are channels on both sides of westernmost island in the entrance island, but the southern channel, being straight, is considered safer for long vessels than the wider rounding channel eastward of the island. Great care should be taken to keep in midchannel.

Chart 8252.—Between Red Bluff Bay and Cascade Bay, 11 miles northward, are four small bays, where small craft may find a depth suitable for anchorage in smooth weather, but only one, Nelson Bay, has protection. None of the bays are important.

Nelson Bay, about 6.8 miles northward of Red Bluff Bay, is an open bight at the head of which is a circular cove having two islets across the entrance. The entrance to the cove is between the north islet and the point north of it, and is 75 yards wide with a depth of 5 fathoms. The cove is 250 yards in diameter between the 10-fathom curves, and the general depth is 15 fathoms, soft bottom. This cove is suitable only for small craft.

Cascade Bay is on the west side of Chatham Strait, about 4.5 miles westward of Point Gardner. It has deep water, rocky bottom, and no good anchorage. Temporary anchorage can be had in the middle of the bay in 26 fathoms. At its head is a prominent cascade seen from a distance in Frederick Sound.

A waterfall, about 300 feet high, which shows well in Frederick Sound is 1.8 miles south of Cascade Bay.

Chart 8239.—Warm Spring Bay, on the west side of Chatham Strait, 7 miles northwestward of Point Gardner, has good anchorage for small craft, but the anchorage for large vessels is indifferent.

Warm Spring Bay Light (57°04.8′ N., 134°46.5′ W.), 27 feet above the water, is shown from a small white house on the south point of the entrance. A shoal with a depth of 6¼ fathoms is about 200 yards offshore 230 yards eastward of the light. There may be less water, and it should be avoided in entering. At the head of the bay is a waterfall, visible from Chatham Strait, and near the waterfall are several warm mineral springs.

Two small bights in the southern shore afford anchorage for small craft. The western one is preferable because of shoaler water, from 12 to 15 fathoms.

The only anchorage in the bay for large vessels is off the western bight in 25 fathoms, but the bottom is rocky and the current from the cascade usually sets out, making a vessel lie broadside to southeast winds which draw into the bay.

Baranof (P.O.) is a village with a general store on the north side of Warm Spring Bay at the head. Warm spring baths may be had here. A small pier with a float alongside affords sheltered mooring for small craft. Fresh water in limited quantity is available at the pier. Mail boats and planes call regularly on schedule. Care should be taken to avoid the reef which makes out 60 yards from the north shore at a point a short distance eastward from the store float.

Ruins mark the site of a saltery which stood on the north shore near the head of the bay.

The bay is easy of access and with the chart as a guide no trouble should be experienced in entering. Midchannel courses are recommended.

Takatz Bay has its entrance on the western side of Chatham Strait about 10.5 miles northwestward of Point Gardner and 15.5 miles southward of Point Thatcher. It terminates in a flat 0.5 mile in extent, formed by a mountain stream emptying as a waterfall.

Point Turbot, the northern point at the entrance to Takatz Bay, is marked by **White Rock**, a large white rock about 75 yards off. A high waterfall about 2 miles northward of Point Turbot is visible from northward a considerable distance.

The southern point at the entrance to Takatz Bay is the northern point of a high wooded promontory forming the southeast side of the bay.

The entrance of Takatz Bay is not visible until close southward of Point Turbot. Give Point Turbot a berth of not less than 0.2 mile when eastward of it and pass in midchannel between Point Turbot and the outer bare

rocks off the south point at the entrance. Leave the two inner bare rocks off the south point at the entrance about 150 yards to the southward, favoring the south shore for about 0.5 mile to avoid a sunken rock in midchannel. Then follow a midchannel course.

The bay affords secure anchorage 2 miles wihtin its entrance in 15 to 18 fathoms, soft bottom, in the basin that opens out just before reaching the narrows.

Small craft may pass through the narrows in midchannel and anchor 0.2 to 0.4 mile beyond them, but should not pass the first small islet 0.5 mile beyond the narrows, as the flat at the head begins there. All known dangers in the bay are charted.

The promontory on the southeast shore of the bay also forms the northern shore of a bight, with the **Takatz Islands,** a group of islands on the south side. The bight has no anchorage, the water being very deep and bottom irregular.

Kasnyku Bay, on the west side of Chatham Strait about 14 miles northwestward of Point Gardner, has deep water and no secure anchorage. The ruins of a lumber company sawmill and wharf are at the head of the bay at **Hidden Falls,** behind a small wooded island. A small white house structure of a discontinued light is on the southeastern end of the island.

The entrance to the bay is between **North Point** and **Round Island,** and its surrounding group of small wooded islets, off the southern point of the entrance. Caution should be exercised in entering the harbor as it has not been thoroughly surveyed.

Cosmos Cove is on the west side of Chatham Strait about 5.5 miles northward of Takatz Bay and 2 miles southward of Kelp Bay. The cove affords anchorage with good shelter in 10 to 15 fathoms, soft bottom, for small vessels. The head of the cove is shoal for a distance of 0.8 mile.

Kelp Bay (57°17′ N., 134°51′ W.), a large indentation in the northeastern coast of Baranof Island, is 10.5 miles southward of the eastern entrance of Peril Strait and 17.5 miles northwestward of Point Gardner. Its entrance is between **North Point** the southern extremity of Catherine Island, and **South Point** on Baranof Island. There is no known commercial activity in the bay.

The main bay extends 3.5 miles northwestward where it divides into three arms. **Middle Arm** extends in a westerly direction. **South Arm** extends in a general southwesterly direction. **The Basin,** in the southeastern part of the bay, is bordered on the east by two groups of islands, which include **Pond Island, Crow Island,** and other adjacent islands. **Portage Arm,** extending in a northwesterly direction, is actually a strait which connects the bay with Hanus Bay in Peril Strait, and separates Catherine Island from Baranof Island. The northwestern half of Portage Arm dries, but small craft can make passage through the strait at high water.

Dangers.—The survey of the bay is old and incomplete, and dangers may exist in addition to those shown on the chart. The known dangers include shoal water which extends 0.4 mile southward of North Point; ledges extending off South Point; **Yellow Rock** and the shoals southward of it; and **Zubof Rock** in the middle of the entrance to the basin.

Anchorages in the bay are few, the best being in the southeastern corner of The Basin. Another is in Middle Arm about 1 mile from its head in 22 to 25 fathoms, soft bottom. A small vessel can find temporary anchorage in Portage Arm about 2.7 miles above the entrance in midchannel, in 10 fathoms, but this anchorage has scant swinging room and is exposed to southeasterly winds which draw through the arm.

Catherine Island is a large high island off the northeastern end of Baranof Island. Mountains take up the greater part of the island. **Point Lull,** the southeastern extremity of Catherine Island, forms the eastern side of **Echo Cove,** a narrow bight, extending in a northerly direction. The cove is open to the southward and affords temporary anchorage for small craft only.

Chart 8252.—Point Thatcher is the northeastern extremity of Catherine Island and the southern point at the eastern entrance to Peril Strait. Peril Strait and Sitkoh Bay are described in Chapter 13.

Wilson Cove, 8 miles northward of Point Gardner, is an open shallow bight in the west coast of **Admiralty Island.** Two small wooded islands and foul ground with kelp extend 0.4 mile off the southern shore. In the entrance is an extensive reef covered at highest tides. Wilson Cove should be avoided as it affords no protection as an anchorage except from easterly winds, and is very foul, bottom showing in 4 or 5 fathoms in places; but should it be necessary, stand in parallel to the south shore, passing southward of the reef in the mouth of the cove, keep clear of the kelp on both sides, and anchor in 8 to 10 fathoms.

Table Mountain, on the southern shore of Whitewater Bay, is peculiarly eroded near the summit. It is the first prominent peak northward of Point Gardner.

Chart 8246.—Whitewater Bay has its entrance on the eastern side of Chatham Strait between Point Caution and Woody Point, 15 miles northward of Point Gardner and 13 miles southward of Killisnoo Island. The bay at the head connects by a narrow passage with a lagoon, bare at low water. Secure anchorage can be had near the head of the bay.

Point Caution is marked by **Lone Tree Islet** which lies 350 yards off the point. Foul ground and kelp extend over 0.7 mile westward and 0.6 mile northward from the point.

Healy Rock, 0.2 mile northward of **Flag Point,** on the southern shore of the bay and 1.3 miles southeastward of Point Caution, is low, bare, and surrounded by ledges marked by kelp. **Sand Point,** named from its formation, is on the north shore about 0.8 mile northeastward of Healy Rock and marks the entrance to the anchorage. A shoal with 1¾ fathoms at its end extends 300 yards

southeastward from Sand Point. **North Island,** low and wooded, lies close to the north shore, 0.5 mile eastward of Sand Point.

Woody Point, the north point at the entrance, has a small, rocky, wooded islet about 100 yards northwestward of it. On the north shore about 0.8 mile southward of Woody Point, is the old native village of **Neltushkin.**

Foul ground marked by kelp extends about 0.3 mile from the north shore of the bay for a distance of 1.3 miles southward of Woody Point. The most projecting is a bare ledge extending 0.3 mile westward from the point westward of Neltushkin, and kelp surrounds the ledge to a distance of 250 yards.

Anchorage may be had in 10 fathoms, soft bottom, about 0.2 mile southwestward of North Island with **Black Point** and Sand Point in line.

Caution.—No recent surveys have been made of the bay. The bottom is very irregular, and there is no certainty that all dangers are charted.

Russian Reef is the northerly end of shoal water and broken ground that extends 1.2 miles northward of Woody Point. The reef is about 0.4 mile in extent in a northwesterly direction and rises abruptly from very deep water on three sides, bares in places, and is marked by kelp. Tide rips form off the reef.

Chaik Bay is on the east side of Chatham Strait about 19 miles northward of Point Gardner. About 2 miles from the entrance it divides into two arms. The northerly arm extends northeastward and the southerly arm eastward, where it terminates in a long flat at the mouth of a stream.

A bare islet is 0.8 mile northwestward of **Rocky Point,** the southern point at the entrance, and a ledge covered at half tide extends 0.3 mile northward from the islet. A bare ledge is nearly 0.5 mile from the northern shore of the bay inside **Village Point.** A kelp-marked patch with 4¼ fathoms is 0.3 mile northwestward of the wooded island in the middle of the bay 1.5 miles within the entrance. The northern arm has good anchorage in 12 fathoms, sticky bottom, but is open southwestward. The southern arm has considerable foul ground and should be avoided by strangers. A sunken rock has been reported on the bar across the entrance to the southern arm midway between the two small islets. The chart is the guide in entering the bay.

Chart 8247.—Distant Point is the southern point at the entrance to Hood Bay. Directly behind it are two mountains which lie between Chaik and Hood Bays. The larger mountain is rounded on top; 2.5 miles southward of Distant Point a spur of this mountain runs toward the water and terminates in a whitish cliff.

Hood Bay has its entrance on the eastern side of Chatham Strait, between Distant Point and Killisnoo Island. It has a general southeasterly direction from its entrance, curving to about east for 7 miles and then divides. **North Arm** has a flat 0.5 mile wide at its head. **South Arm** is free from midchannel dangers inside its entrance. Anchorage is available in each arm for large vessels in suitable depths. Small craft find anchorage at the head of each arm in 5 to 10 fathoms, mud bottom.

A rock with 2 fathoms over it and lying 1.2 miles northeastward of Distant Point is marked by a lighted buoy. A buoy marks a rock with 2½ fathoms over it 1.4 miles northwestward of **House Point.**

Cabin Point, about 3.5 miles southeastward of the entrance buoys, extends 0.4 mile from the northeastern shore of the bay. The cove westward of the point is foul and has several shacks at its head; the cove northeastward of the point is shoal but offers anchorage for small craft and shelter from northerly weather in 4 to 10 fathoms, hard sand bottom. A lighted buoy marks the edge of shoal water extending southwestward of the point.

Ruins of a saltery are in the bight on the northern shore about 1.5 miles eastward of Cabin Point. A buoy marks the western limit of the shoal extending from the eastern point of the bight.

A cannery is on the north side of the entrance to North Arm. A rock with 2¾ fathoms over it and marked by a buoy is off the southwestern corner of the cannery wharf, which has a face 300 feet in length with a depth of 24 feet alongside. The northeastern 60 feet of this wharf is used as an oil wharf. Available supplies include gasoline, diesel oil, fuel oil, lubricating oil, and fresh water. The cannery operates a general store and radio station during the season. Some machine shop facilities are available. There is scheduled passenger and mail air service with Juneau and Sitka.

Ice in South Arm makes navigation unsafe and quite often impossible during January, February, and part of March. Ice also forms in North Arm from its head to within 0.2 mile of the cannery.

Chart 8285.—Killisnoo Harbor is on the eastern side of Chatham Strait, 28 miles northward of Point Gardner, and on the north side of the entrance to Hood Bay.

Killisnoo Island is wooded; **Point Samuel** is its western end. A ledge, well bare at low water, extends about 125 yards off the southeast end of Killisnoo Island. **Killisnoo Harbor Light (57°28.3′ N., 134°34.0′ W.),** 16 feet above the water, is shown from a small white house on a skeleton structure on a concrete pier on a rock off the northeast point of Killisnoo Island. A buoy marks the reef off the north side of the west end of Killisnoo Island.

Table Island, about 30 feet high, sandy, and grass-covered, is about 0.5 mile south of Killisnoo Island. It is surrounded by reefs to a distance of nearly 0.3 mile. On its north side the 3-fathom curve is fairly close to the island, but kelp extends out 300 yards into 6 and 8 fathoms. A small islet is 0.1 mile southwestward of the island.

Sand Island, 1.3 miles southeastward of Table Island, is about 10 feet high and is the northwest end of a chain of reefs 2 miles long parallel to the east shore of the bay. A straight but narrow channel lies between these reefs and the east shore. A bar with 4½ to 10 fathoms over it is between Sand Island and Table Island.

Lone Rock, which bares, is 0.3 mile southeastward of the southeast end of Killisnoo Island. It is surrounded by kelp and is marked on its northwestern side by a buoy. The bottom is foul and considerable kelp is between the

rock and the southeastern shore and no safe channel between.

Killisnoo, on the northeastern side of the east end of Killisnoo Island, is the site of a former native village and cannery.

The anchorage is in midharbor off the east end of Killisnoo Island, in 14 to 15 fathoms. The harbor is somewhat exposed to southeast gales but no considerable sea makes into the anchorage.

The tidal currents at Killisnoo are irregular, but the averages show that the current on the last half of the falling tide and the first part of the rising tide sets from Hood Bay westward through the harbor and northern channel, and that the current on the second half of the rising tide and first half of the falling tide sets eastward through the northern channel and the harbor into Hood Bay. For daily predictions, see the Tidal Current Tables.

The current follows the channel, and the velocity is not important except in the narrow part of the northern entrance.

Channels.—The southern channel leads between Table and Killisnoo Islands and between the buoy marking Lone Rock and the east end of Killisnoo Island.

The northern channel leads between Killisnoo Island and Kenasnow Rocks and between Killisnoo Island and Admiralty Island. In summer kelp extends entirely across the channel. The kelp is useful in defining the channel. The least depth in both channels is about 4 fathoms. The chart is the guide for both channels.

Kootznahoo Roads is on the north side of Killisnoo Island and forms part of the northern channel leading to Killisnoo.

Kenasnow Rocks are an extensive ledge about 0.5 mile offshore southwestward of Angoon. Portions of the ledge are always above water, and it is surrounded by heavy kelp, especially on its inshore side. There is a channel between it and the shore, the latter being fringed with kelp for some distance. The south end of the ledge is 0.8 mile north of Killisnoo Island.

Angoon (pop. 395; P.O.) is a village with a general store on the eastern side of Chatham Strait, about 1.7 miles northward of Killisnoo Island. A 430-foot T-head pier has 10 feet of water at its outer face.

Chart 8247.—Danger Point, on the eastern shore of Chatham Strait, 30 miles northward of Point Gardner and 2.5 miles northward of Point Samuel, the western extremity of Killisnoo Island, forms the southern point at the entrance to Kootznahoo Inlet. **Danger Point Light (57°30.9′ N., 134°36.3′ W.)**, 30 feet above the water, is shown from a white square daymark on a white skeleton tower on a pyramidal concrete pier near the end of the reef which extends about 0.2 mile northward from the point.

Kootznahoo Inlet is an intricate group of narrow passages, lagoons, and bays on the eastern shore of Chatham Strait 2.8 miles northeastward of Killisnoo Island. It is full of rocks and reefs, and through the narrow passages the tidal currents rush with great velocity. The navigation of Kootznahoo Inlet is such that it should not be attempted except by small craft of short length and ready turning qualities, and then only at slack water and with local knowledge. Fishing vessels are the only ones that navigate the inlet.

The entrance is between Danger Point and **Kootznahoo Head,** and it extends southeastward to **Turn Point,** where it divides into three arms. The southernmost arm continues in a southeasterly direction to Favorite Bay; the northernmost extends eastward to Mitchell Bay; the middle arm, also extending eastward, leads among the islands, is obstructed at its entrance and navigable only for small craft. The lagoons between the islands are full of rocks and reefs, and are not navigable except for small craft.

From its entrance the inlet is free from obstructions until Village Rock is reached. **Village Rock** is a large low-water ledge extending toward Turn Point halfway across from the village of Angoon on the south side. Large swirls occur here caused by the great velocity of the tidal currents.

Southeastward of Village Rock, the south shore is clear for nearly 0.5 mile. The north side is obstructed by a ledge marked by kelp at slack water, which terminates in **Rose Rock,** which is covered at high water.

The passage to Favorite Bay is obstructed at its northwestern end by a series of rocks which bare. There are deep passages among these rocks. The eastern end of the passage is obstructed by a rock in midchannel about 0.5 mile southeastward of the fishing village on the southwest shore and 0.2 mile northwestward of the entrance to Favorite Bay.

Favorite Bay has anchorage in 10 to 17 fathoms near the southwestern shore anywhere westward of a high bluff marking the end of the flat that extends 1 mile from its head. The bay is used as a fishing ground for herring.

From Rose Rock, the northern channel turns sharply northeastward along the northwest side of the reef making out from **Channel Point,** between it and an extensive ledge on the north side of the channel, for about 0.3 mile to Stillwater Anchorage.

Stillwater Anchorage is about 1.2 miles long from Turn Point northeastward to Pillsbury Point, and 300 to 600 yards wide, with general depths of 16 to 20 fathoms. West of Pillsbury Point a short arm makes northward about 0.5 mile.

From Stillwater Anchorage the channel leads close to an islet on the south side, between it and a ledge extending 200 yards southwestward of **Pillsbury Point.** The channel then narrows to 200 yards, with reefs on both sides, and extends northeastward for 0.5 mile to **Point Bridge** where it passes between a reef on the north side and a bold bank on the south side. The channel then has a northeasterly direction for about 0.8 mile, with a width of less than 200 yards and bold shores, and then widens to 0.2 mile and continues in the same direction for 1.6 miles to **Hemlock Point,** and then turns easterly for 1 mile to **North Point,** eastward of which is Mitchell Bay. Extensive ledges on the north side extend westward from North Point.

Mitchell Bay is connected at its western end with a

lagoon full of rocks, reefs, and shallow water. Several islands lie in the bay 1 mile from its west end, and the water is foul between them and the west end of the bay. From its entrance at North Point, the channel follows the north shore for 1 mile, where it passes between it and **Diamond Island,** the northernmost island in the western part of the bay. Beyond Diamond Island, Mitchell Bay is clear, and has general depths of 12 to 20 fathoms near Diamond Island, decreasing to 10 fathoms at its eastern end.

Davis Creek extends southwestward from Mitchell Bay and then widens into Kanalku Bay. **Lighter Creek** makes westward from Davis Creek about 0.5 mile from its north end, and has depths of 1 to 3 fathoms. Davis Creek is foul. At its north entrance a ledge, which partly bares, extends eastward from the western shore, inclosing **Passage Islet** and nearly closing the channel. At the south end of Davis Creek is **Stone Islet;** an extensive ledge crosses the channel at this point, with a narrow passage through.

Kanalku Bay is a clear open basin with depths of 6 to 10 fathoms. In the bay are two islands and at its head two large streams and a flat, 0.5 mile wide. On the south side are extensive coal croppings and a deposit of marble.

The **tidal currents** have great velocity in Kootznahoo Inlet, and it should be navigated at slack water, the safest condition being low-water slack. For times of slack water, see the Tidal Current Tables. The flood current at the entrance sets in nearly parallel to the northeast shore, and so continues until it reaches Village Rock, where it divides, one part going northeastward around Turn Point and the other continuing southeastward south of Rose Rock, where it again divides. One part continues southeast into Favorite Bay, while the other turns short around the rock and divides again, one part going northeast and the other following the northern channel.

Vessels rounding Rose Rock at slack water can carry slack water all the way to Mitchell Bay.

At Village Rock, the currents have a velocity of 5 to 8 knots; at Point Bridge, as high as 10 knots; and at Passage Islet, as high as 7 knots. Rapids begin at Village Rock and continue until well past Rose Rock.

From Pillsbury Point to Point Bridge the current is very swift, probably reaching 10 knots, with much boiling and swirling, the worst place being at Point Bridge. This can be passed only at slack water, which lasts only a few minutes.

Through all the narrow channels leading into the various bays the currents have great velocity, and they should not be attempted in any kind of a boat except at slack water. For daily predictions, the Tidal Current Tables should be consulted.

Caution.—The navigation of Kootznahoo Inlet should not be attempted by strangers. A guide can be obtained at Angoon.

Chart 8202.—The bight 26 miles northward of Kootznahoo Head and on the north side of **Point Hepburn** affords anchorage for small craft in 5 fathoms with shelter from southeast winds. A stream enters the head of the bight.

Square Cove, on the east side of Chatham Strait, 2 miles northward of Point Hepburn and 7 miles southeastward of Point Augusta, is on the north side of **Cube Point.** It affords anchorage for small craft with protection from southeast winds. The cove is about 500 yards in length and of half that width, and there is a depth of about 3 fathoms within 200 yards of its head and deeper water farther out. There are no dangers. A stream enters at each end of the sand beach at its head, the eastern one forming a cascade.

Chart 8283.—Point Hayes is the northern point of the eastern entrance to Peril Strait. A lighted bell buoy marks the southeastern extremity of Morris Reef which lies off Point Hayes. Point Craven is about 1.2 miles southwestward of Point Hayes.

Peninsular Point, about 1.5 miles northward of Point Hayes, is formed by a wooded hill which lies off the general trend of the shore and to which it is connected by a low, narrow valley.

White Rock is a prominent light-colored rock lying off the edge of a flat at the mouth of a stream about 4 miles northward of Point Hayes. A prominent valley extends inshore to westward of White Rock.

Basket Bay, on the west side of Chatham Strait, 11 miles northward of Point Hayes, narrows slightly at its head, where there is a flat 250 yards wide and a large stream. The bay is exposed to southeast, the bottom rocky, depths 24 to 40 fathoms, and is not recommended as an anchorage. The midchannel course up the bay is clear.

Charts 8202, 8252.—Tenakee Inlet is on the west side of Chatham Strait, 100 miles northward of Cape Ommaney. The entrance is between South Passage Point and East Point, and is 2.5 miles wide. It has a general westerly direction for 10 miles and then north-northwesterly for 25 miles, narrowing near its head to 0.5 mile. At its head is a flat 0.8 mile in extent, and on the south shore 4 to 7 miles from its head are three bights filled by flats. At 1.8 miles from the head of the inlet is a portage of about 70 yards at high water, and about 8 feet high, connecting with Port Frederick in Icy Strait. The depths in the inlet are great and the dangers easily avoided. A number of bays on the south side afford anchorage.

South Passage Point Light (57°45.8′ N., 134°56.2′ W.), 50 feet above the water, is shown from a small white house on an islet off the point. A rock awash at lowest tides and surrounded by kelp is 0.5 mile northward of the light. The rock is marked by a buoy on its east side.

A 3-fathom shoal is in **Trap Bay** about 2.7 miles 258° from South Passage Point Light.

East Point, the northern point at the entrance to Tenakee Inlet, can be identified by a grassy knoll at its outer end.

Cannery Point is on the north side of the inlet 4.5 miles

westward of South Passage Point. A cannery with a wharf is in the first bight west of Cannery Point. The wharf has a face 305 feet long with a depth of 24 feet alongside. A sunken rock with about 3 fathoms over it, marked by a private barrel buoy, is about 100 yards southwestward of the western end of the wharf. Fresh water can be obtained at the wharf. The cannery operates a general store and radio station during the season. Vessels usually make a port landing at the wharf. The flood current is reported to set on, and the ebb current off the wharf.

Local magnetic disturbance.—Differences of as much as 3° from the normal variation have been observed in the vicinity of Cannery Point.

The ruins of a cannery are in the second bight west of Cannery Point. A daybeacon marks a rock awash about 2.2 miles west of Cannery Point.

A light, 30 feet above the water and shown from a small white house, marks the small islet close to the northerly shore about 0.8 mile eastward of the wharf at Tenakee Springs.

Tenakee Springs (pop. 60; P.O.) has a wharf float with seaplane ramp, store, cafe, crab cannery, and health resort at the warm springs on the northerly side of Tenakee Inlet about 9 miles inside the entrance. It has regular communication by small craft with Juneau. A scheduled air passenger and mail service is maintained with Juneau. The wharf has a 100-foot face with a depth of 22 feet alongside. Available supplies include gasoline, diesel oil, and water.

Tenakee Reef, two rocks covered at high water and marked by a light, lies nearly 0.8 mile southward from Tenakee Springs, and another similar rock, marked by a daybeacon, lies 0.5 mile northwestward of these rocks.

Kadashan Bay, on the southern side of Tenakee Inlet opposite Tenakee Springs, is filled with a flat which bares.

Crab Bay is 4 miles southwestward of Tenakee Springs. On its south side is an extensive flat surrounding a high-water island. At its head is a flat 0.8 mile in extent and a small stream. There is anchorage 1 to 1.8 miles from its head in 15 to 20 fathoms.

Saltery Bay, 3 miles northwestward of Crab Bay, is a small bay and inlet, the entrance to which is clear; a flat extends 0.5 mile from the head of the inlet. It affords anchorage for small vessels near its head in 7 to 10 fathoms.

Two small rocks, covered at half tide, lie 0.7 mile from the northeast shore of Tenakee Inlet and 7.5 miles northwestward of Tenakee Springs. In passing them the south shore should be favored somewhat. A rock has been reported to lie midway between these rocks and the northeastern shore.

Seal Bay is on the south side of the inlet 10 miles westward of Tenakee Springs. A flat extends 0.8 mile from its head, and a rock, covered at high water, is near the middle of the bay 1.5 miles inside the entrance. The depths are 19 to 29 fathoms, soft bottom, between the rock and the flat, a distance of 0.8 mile.

Long Bay is on the south side 2.5 miles westward of Seal Bay. From the northwest point at the entrance a reef, covered at half tide, extends eastward nearly 0.5 mile, leaving a clear channel between the reef and the south shore 0.2 mile wide and 12 fathoms deep. The depths within the bay are 5 to 15 fathoms, mud bottom, affording secure anchorage. A flat extends 0.8 mile from its head.

Anchorage may be made at the head of Tenakee Inlet near the sand flat in 7 to 15 fathoms.

Currents.—In Tenakee Inlet, south of Tenakee Springs, the current velocity is about 1 knot.

Freshwater Bay has its entrance on the west side of Chatham Strait between East Point and North Passage Point, and extends 11 miles northwestward, terminating in a sand flat with a large stream. There is a bare rock about 8 feet high nearly 0.5 mile from the north shore 3.5 miles inside North Passage Point, and two islands in midchannel farther westward. The main bay has no anchorages, but small vessels may find temporary anchorage at the head of the bay or off the flats at mouths of streams, of which there are several.

North Passage Point, the north point at the entrance to Freshwater Bay, is long, low, level, and wooded, and is distinctive from other points in the vicinity. Kelp extends for more than 100 yards off the end of the point.

Wachusett Cove is a small bight on the southwest side of Freshwater Bay, 2 miles northwestward of East Point. The cove is almost filled with a flat and there is a small stream at its head. A fair-weather anchorage may be made between the points at the entrance to the cove in 8 to 10 fathoms.

Pavlof Harbor is 1.5 miles westward of Wachusett Cove. A large stream enters the southwestern part of the harbor. A reef, covered at half tide, extends 90 yards from the east point at the entrance, and the entire east side of the bay is bordered by a flat 250 yards wide. A pinnacle rock, covered at half tide, is 220 yards from the west side halfway up the bay. Anchorage may be made outside the rock in about 15 fathoms and in the middle between the rock and the southeast shore, the clear anchorage being 350 yards wide in 5 to 12 fathoms, sand and rock bottom. The shelter is good, and the harbor is easily entered, though in strong westerly weather the wind draws down the bay with considerable force.

Cedar Cove, on the south side 1.2 miles westward of Pavlof Harbor, affords shelter for small craft, but its entrances are very narrow and foul.

Iyoukeen Cove is close northward of the entrance to Freshwater Bay, from which it is separated by a long, narrow, wooded peninsula, terminating in North Passage Point. It does not afford shelter except from offshore winds, but can be used temporarily by anchoring about 0.5 mile from the south shore in 23 fathoms. **Gypsum** is an abandoned gypsum mine at the head of Iyoukeen Cove.

False Bay, 5 miles northward of Iyoukeen Cove, is an open bight with deep water. Fair emergency anchorage for small craft may be found in its southern part in 3 to 5 fathoms, rocky bottom.

Point Augusta, on the west side of Chatham Strait at

its junction with Icy Strait, is marked by **Point Augusta Light (58°02.3′ N., 134°56.8′ W.)**, 45 feet above the water and shown from a small red house on the point.

Point Marsden is on the east side of Chatham Strait opposite Point Augusta.

Chart 8302.—Hawk Inlet has its entrance on the east side of Chatham Strait 10 miles southeastward of Rocky Island. It has a northerly direction for a distance of 5 miles from its mouth. It then contracts and changes to a northeasterly direction, terminating in a basin nearly 1 mile in diameter. Five small streams enter the basin forming extensive mud flats along its shores. Anchorage can be had in 6 to 7 fathoms nearly in the middle of this basin.

The entrance to Hawk Inlet is narrowed by ledges, which bare, and which extend 350 yards southward from the north point at the entrance. Kelp extends outside the ledge to a distance of about 0.2 mile southward and eastward from the point. The limits of the kelp and dangers are marked by a lighted and an unlighted buoy.

Two Island Cove, which dries, is on the south side of the entrance. Two small islets are in the mouth of the cove. About 0.6 mile southwestward of Two Island Cove, another small cove affords good anchorage for small craft in 9 to 10 fathoms, except with northwest winds. A ledge, bare at half tide, is in the middle of the entrance to the cove. A deep channel is on either side of the ledge, but the best one is on its northeast side. A ledge extends 0.2 mile northwestward from the southwestern point of the entrance to the cove. The anchorage is in the middle of the cove about 300 yards southward of the ledge in the entrance.

About 0.8 mile up Hawk Inlet, on its east side, two streams enter, forming an extensive flat extending two-thirds the distance across, leaving a channel 200 yards wide, with 7 fathoms in the middle, between it and the west shore. Here the tidal currents have considerable velocity, causing swirls. The outer point of the shoal is marked by **Hawk Inlet East Shoal Light (58°06.2′ N., 134°46.2′ W.)**, 20 feet above the water and shown from a small red house on a dolphin. The greatest depth in Hawk Inlet, 45 fathoms, is off the cannery, about 1.3 miles northward of the light.

A cannery and post office, open during the summer, are on the east side of Hawk Inlet, about 1.4 miles northward of the light. The outer face of the cannery wharf is 200 feet long and has depths of 30 feet at the north end and 22 feet at the south end. Three-pile dolphins are 50 feet off the north and south corners of the wharf. A pile marks the outer end of a shoal close southward of the wharf. There is a small-craft float on the north side of the wharf and a 270-foot pier with an airplane float at the end, about 70 yards south of it. An oil dock with a 45-foot face and 12 feet alongside is about 170 yards northward of the cannery wharf. There are grid-irons inshore northward of the wharf. For information about marine railways in Alaska, see Chapter 3.

A general store and a radio station are operated by the cannery during the season. Gasoline, diesel oil, and fuel oil are stored for the cannery use and fresh water can be obtained at the wharf. Daily passenger and air mail service is maintained during the summer, and the local mail boat stops at the inlet.

Currents.—The ebb current at the wharf has very little velocity; the flood is reported to set slightly toward the wharf.

In entering Hawk Inlet pass 100 to 250 yards southward and eastward of the buoys near the entrance and 100 yards westward of the light marking the point of the shoal. Favor the west shore for 0.2 mile past the light and then head for the cannery.

11. LYNN CANAL

Chart 8202.—Lynn Canal extends from the junction of Chatham Strait and Icy Strait, at Hanus Reef, in a north-northwesterly direction for about 55 miles to Seduction Point, where it divides into two arms, called Chilkat and Chilkoot Inlets; the latter inlet extending 25 miles farther north from Seduction Point. At Rocky Island, the canal is 5 miles wide; from Point Howard to Ralston Island about 3 miles wide; thence it averages 6 miles wide to Seduction Point. The canal is nearly free of dangers, and the water is generally very deep. The shores as a rule are very high and wooded, with many bare mountain peaks and small glaciers in nearly every ravine.

Anchorage can be had in Funter Bay, William Henry Bay, west of Sullivan Island, and Portage Cove (Chilkoot Inlet). Temporary anchorage can also be had in St. James Bay, Berners Bay, and at Skagway. There are several coves where small craft can find anchorage.

Currents in Lynn Canal have a velocity of 1 to 1.5 knots in the southern part, diminishing in velocity toward the head. From Point Whidbey to Point Sherman the currents are quite regular and apparently tidal. Off Berners Bay rips and eddies are noted and sets across the channel occur. From Point Sherman to Chilkoot Inlet currents are quite regular and of moderate strength. Off the mouth of the Endicott River, at times, the river water extends a considerable distance offshore, where its limits are often well defined. In the vicinity of the Chilkat Islands the currents are moderate and no peculiarities were noted. In Chilkoot Inlet, the currents are regular and apparently tidal. South of the Katzehin River much fresh water is noticeable. In the constricted channel, between the bar and the western shore, the currents are strong, but not irregular. In the vicinity of Indian Rock, an easterly set across the channel has been noted. The current in Taiya Inlet is moderate and regular. For daily predictions for places in Lynn Canal, see the Tidal Current Tables.

Chart 8302.—Hanus Reef is a dangerous reef which lies at the junction of Chatham Strait, Icy Strait, and Lynn Canal. The highest part of the reef, bare at half-tide, is marked by **Hanus Reef Light (58°07.9′ N., 134° 59.8′ W.)**, 28 feet above the water, shown from a small white house on a skeleton tower on a concrete pier. The light marks the entrance to Lynn Canal. At times the tidal current attains a velocity of 2 to 3 knots over the reef.

Rocky Island, grass-covered and marked by a light, is 3.2 miles northwestward of Hanus Reef. The water is deep to within 250 yards of the island. As the currents are erratic in the channel between Rocky Island and Point Couverden the slight saving in distance this channel offers does not warrant its use; however, if used, vessels should favor Rocky Island, as shoal water extends from Point Couverden.

Swanson Harbor is formed by a group of islands and reefs off the extreme southeast point of the mainland at the junction of Icy Strait with Chatham Strait and Lynn Canal. It affords good anchorage and shelter. The northeast side of the harbor is formed by Couverden Island and a small island between its western end and the mainland, all connected at low water. The southwest side is formed by Ansley Island and **Entrance Island.**

Swanson Harbor Entrance Light (58°11.6′ N., 134°04.6′ W.), 21 feet above the water, is shown from a small white house on the southwesterly side of Couverden Island. **Ansley Island** is marked by an aviation light.

Sharp Ledge is 0.1 to 0.2 mile eastward of the southeast end of Entrance Island, and another ledge extends nearly 0.5 mile from the southeast end of Entrance Island toward Rocky Island. These ledges are covered at half tide and marked by kelp.

No Use Ledge which uncovers 12 feet is about 0.4 mile northwestward of the northeast end of Couverden Island.

To enter Swanson Harbor, bring Rocky Island astern on a northwesterly course and follow the southwest shore of Couverden Island at a distance of about 250 yards until Entrance Island is passed. Then steer a midchannel course until up with the northwestern end of Couverden Island. Then follow the shore of Ansley Island at a distance of about 250 yards to the anchorage. Anchor with the northeast side of Entrance Island just open from the east side of Ansley Island, and with the northwest end of Ansley Island bearing south, distant 0.3 mile, in 14 to 16 fathoms, soft bottom. Small vessels anchor close in the head of the bay or to the east side of the head behind No Use Ledge.

Couverden Island and the islands close by appear from most points of view as a long, low, wooded point, the southeast extremity of which is **Point Couverden.**

Couverden Rock is 2.4 miles northward of Rocky Island, and should not be approached closer than 200 yards. It is the outer one of the group of islands and rocks extending 4 miles southeastward from the western shore of Lynn Canal.

Funter Bay, the best and most convenient anchorage in the vicinity, is on the east side of Chatham Strait at

its junction with Lynn Canal, about 10.5 miles southward of Point Retreat and 5.5 miles northeastward of Rocky Island.

An inactive cannery and wharf in poor condition are on the northwest side of the bay. On the east side of the cannery there is a float for small vessels and aircraft. A rock ledge is off the southeastern side of the wharf close in preventing vessels of any size from using that side.

The south point at the entrance has several small islands near it, with a clear channel between. **Station Island,** the largest and wooded, is joined to two small islets southward at low water. **Rat Island,** bare, is 0.2 mile northeastward of Station Island; a ledge which bares extends 0.1 mile northwestward from it.

Clear Point Light (58°14.6′ N., 134°54.9′ W.), 26 feet above the water, shown from a white pyramidal skeleton tower on a house on the point, marks the north side of the entrance to Funter Bay.

Four islets are in Funter Bay between Clear Point and the head. **Bare Island** is the first from Clear Point. A 1-fathom shoal is about 100 yards southeast of Bare Island. **Curlew Ledge,** bare at low water, is 200 yards southward of Bare Island. A shoal, with 1¾ fathoms over it, extends 100 yards southward from the ledge, and is marked at its southeast end by a buoy. **Gauge Island,** the second islet, is wooded and surrounded by ledges. **Star Rock,** a small pinnacle, bare at lowest tides, is 120 yards northward of Gauge Island. **Ledge Island,** the third islet. is surrounded by bare ledges. The fourth islet and the largest, lies at the head of the bay, and is connected with the main shore at low water.

Coot Cove, at the northwest end of the bay, has extensive beaches at its head, where the cannery has gridirons and ways. **Crab Cove,** with depths of 3¾ fathoms to 12 fathoms, lies at the northeast end of the bay.

Only a few buildings mark the sites of the stamp mill and smelter which stood on the southeastern side of the bay.

A fish-buying scow is anchored at the head of the bay from May 1 to September 15. All fishermen's supplies are available, including groceries, diesel oil, and gasoline. There is a mooring float for small craft, where fresh water can be obtained.

Anchorage in Funter Bay can be made about 0.2 mile southwestward of the cannery. Small craft can find protected anchorage in Coot Cove or Crab Cove. The channel to the westward of Bare Island is frequently used by boats proceeding to the cannery.

The Kittens, two small islands 0.2 mile offshore, are 0.8 mile northwest of Clear Point.

Naked Island is 1.1 miles northwestward of Clear Point and 0.5 mile offshore, with deep water between. **Naked Island Light (58°15.4′ N., 134°56.7′ W.),** 40 feet above the water, is shown from a small white house on the highest part of the island. A rock awash is 160 yards from the Mansfield Peninsula shore and about 0.5 mile northeastward of the light. **North Ledge,** awash at high water, is 0.1 mile northwestward of Naked Island.

Point Howard, on the west side of Lynn Canal, is about 6.8 miles northward of Rocky Island. A ledge, which bares, is about 0.2 mile southward of the point.

False Point Retreat, on the east side of the canal 7 miles northward of Naked Island, is marked by a daybeacon.

Point Retreat, the northern extremity of Admiralty Island, is at the turning point from Lynn Canal to Saginaw Channel. Ledges, awash at half tide, extend about 300 yards northward from Point Retreat, and about the same distance off its west side for 0.5 mile southward. **Point Retreat Light (58°24.7′ N., 134°57.2′ W.),** 63 feet above the water, is shown from a 25-foot square concrete tower on a building. A fog signal and radiobeacon are at the light.

Hump Island, at the juction of Saginaw Channel with Lynn Canal, is wooded. A reef extends 300 to 400 yards offshore.

Lincoln Island is separated from the northwest end of Shelter Island by a narrow navigable channel about 0.2 mile wide. The island is wooded and has three summits one at each end and one in the middle separated my low divides. On the southern shore at the base of the middle knob are some prominent boulders.

Ralston Island, close to the northwest end of Lincoln Island is wooded. **Little Island,** grass-covered and marked by a light, is about 0.3 mile northward of Ralston Island. A rocky ledge extends about 0.3 mile northward. A detached 2¾-fathom spit lies about 700 yards northward of the island.

Lynn Sisters are two wooded islands, close to the western shore of Lynn Canal, about 3.5 miles southwestward of Little Island. They are connected with each other and with the shore at low water.

Poundstone Rock, about 3.8 miles east-southeastward of Little Island and 1.1 miles southward of Sentinel Island, has 2¾ fathoms over it and is marked on its northwestern side by a lighted bell buoy. From Poundstone Rock, a ridge extends 3 miles toward Vanderbilt Reef with depths of 5¼ and 7 fathoms for 1.3 miles northwestward of the rock.

Sentinel Island, about 3.5 miles northward from the northern extremity of Shelter Island is marked by **Sentinel Island Light (58°32.8′ N., 134°55.3′ W.),** 86 feet above water and shown from a 51-foot white square tower on a building. A fog signal is at the light. A shelving ledge extends about 0.2 mile in a northwesterly direction from the northern end of the island.

Benjamin Island, about 0.8 mile northeastward of Sentinel Island, is timbered, and has two knobs near the southern part of the island. A small wooded islet lies close to the south point of the island, and a small grassy islet is 0.2 mile northeastward of the north point of Benjamin Island; rocks which bare extend 0.3 mile northward.

Temporary anchorage, with protection against severe winds, may be obtained in the bight in the south side of Benjamin Island.

North Island is wooded, and is separated from the end of Benjamin Island by a narrow shallow channel with strong currents. A shoal with 3¼ fathoms over it lies 0.1 mile southwestward of North Island.

Vanderbilt Reef Light (58°35.5′ N., 135°01.1′ W.), 36 feet above water, is shown from a small house on a skeleton structure on a concrete pier on a rock that uncovers 12 feet about 4 miles northwestward of Sentinel Island Light.

Yankee Cove, a small bight on the east shore of Lynn Canal, is east-northeastward of North Island. **Bessie Creek** empties into the head of the cove.

Bridget Cove, about 3.2 miles northeastward of Vanderbilt Reef, lies behind **Mab Island,** affording anchorage for small craft in 4 to 7 fathoms, with scant swinging room. Small boats may secure better protection by anchoring inside the cove opposite the north end of Mab Island; the beach makes out about 100 yards at low water. A well-defined trail crosses to the river mouth on the south side of Berners Bay.

St. James Bay lies on the western side of Lynn Canal, inside of **Point Whidbey,** the eastern point of the entrance, about 11.5 miles north-northwestward of Point Retreat. This bay extends 5 miles in a northerly direction to its head, where a large stream enters, forming extensive mud flats. A temporary anchorage, in 20 fathoms, soft bottom, may be selected on the eastern side of the bay, 2 miles north of Point Whidbey. The anchorage is open to southeast winds.

The **Lynn Brothers** are a chain of islands parallel to the western shore of St. James Bay. Small boats can enter the basin westward of the islands by a 5-fathom channel through the reefs at the southern end of the islands.

From Point Whidbey the west shore of Lynn Canal extends in a north-northwesterly direction, with some indentations and rocky shoreline, about 3.6 miles to a narrow inlet leading into **Boat Harbor,** a basin with depths up to 14 fathoms. It can be entered by small craft only, because of its contracted entrance, which is about 100 feet wide in its narrowest part and has a controlling depth of 2¾ fathoms and apparently is clear, though the turns are sharp. The currents have considerable velocity through the entrance.

William Henry Bay is on the western side of Lynn Canal, 9 miles northward of Point Whidbey. It is easy of access and is the best anchorage in this vicinity from southerly weather. According to local reports, northerly winds are felt with considerable force. Enter in mid-channel, and when the second waterfall on the western shore of the bay is abeam, anchor in 14 fathoms, soft bottom, about 0.4 mile from the head. The shores are high and bold. **Beardslee River** enters at the head, where there is a flat 350 yards wide. The wharf on the eastern side of the bay is in ruins.

Endicott River, about 4 miles northward of William Henry Bay, flows from the westward through a narrow, deep gorge in the mountains. A broad shoal makes out from the mouth of the river nearly 0.7 mile. A narrow channel follows close around the cliff on the southern side. Small craft may enter the lagoon at half tide in the flats just northeastward of the river's month.

Berners Bay is a large indentation on the east side of Lynn Canal between **Point Bridget** and **Point St. Mary.** From Point Bridget it has a northerly direction for 6 miles to the extensive flats at the head where several large streams make in. The bay is open to southerly winds, but in fine weather temporary anchorage in 16 to 25 fathoms may be selected near the head; the chart should be the guide.

Eastward of Point Bridget are two bights. The westernmost is filled by flats, and the water is shoal for over 0.2 mile offshore. **Echo Cove,** the east bight, has its entrance 2 miles eastward of Point Bridget. The entrance is nearly blocked by a flat making out from the west point, leaving a very narrow channel, that follows the east shore at a distance of 150 yards and has a controlling depth of 2¾ fathoms. Inside, the depths are 4½ to 10 fathoms, and small vessels using caution can enter and find secure anchorage.

Point Sherman, on the eastern side of Lynn Canal, about 9 miles north-northwestward of Berners Bay, is prominent. Temporary fair-weather anchorage may be had in 14 fathoms, mud bottom, in the bight northward of Point Sherman. In approaching from southward give the point a wide berth. A ledge, with 2 fathoms at its end, extends 0.3 mile northwestward from Point Sherman; it bares a considerable distance from the point.

Sherman Rock, 0.5 mile southwestward of Point Sherman, has about 1 fathom over it and is marked on its northwestern side by a lighted whistle buoy.

Chart 8303.—Comet is an abandoned settlement on the eastern side of Lynn Canal, about 0.8 mile northward of Point Sherman.

Sullivan Island, on the western side of Lynn Canal about 6 miles northwestward of Point Sherman, is timbered. It has several knobs on the southern end; the highest is separated by a saddle from the ridge at the north end of the island. **Sullivan Rock** lies off the southern end of the narrow wooded island south of Sullivan Island.

Anchorage may be obtained in 18 fathoms, sticky bottom, in the bight in the west shore, westward of the south end of Sullivan Island. Vessels entering from the southward should favor the islands. Entering from the northward the only danger to be avoided are the rock awash, and the rock with ¾ fathom on it, 0.4 mile off the western shore in about the middle of the island.

Anchorage for small boats, with protection against northerly winds may be obtained in the small bight on the eastern shore of Sullivan Island near the southeast end.

In entering avoid the reef which extends about 0.2 mile off the northeast entrance point.

Eldred Rock, about 7.5 miles north-northwestward from Point Sherman and 1.4 miles from the easterly shore of Lyn Canal, is marked by **Eldred Rock Light (58°58.3′ N., 135°13.2′ W.),** 91 feet above water, shown from a 56-foot white octagonal tower on a building. A fog signal and a radiobeacon are at the light. A ledge extends about 300 yards northwestward from Eldred Rock, and a rock with ¾ fathom over it is 0.3 mile 325° from Eldred Rock Light.

Chilkat Islands, a chain of four wooded islands, extend 5 miles in a south-southeasterly direction from Seduction Point. **Kataguni Island,** the southern one, lies about 2.5 miles north-northwestward of Eldred Rock. **Shikosi Island,** next, northward of Kataguni Island, has a bight in its northern side which affords anchorage for small craft with shelter from moderate southerly winds. A shoal with depths of as little as 1 fathom, and terminating in a rock which bares, extends over 0.2 mile northward from the eastern point of the bight. Favor the westerly point of the bight in entering. A daybeacon marks the northeast point of **Talsani Island,** the northern of the Chilkat Islands.

Prohibited dumping ground.—Dumping of objects and materials of any type or class is strictly prohibited in Lynn Canal north of latitude 59°, including Chilkat, Chilkoot, Lutak, and Taiya Inlets.

Chilkat Inlet, the western arm at the head of Lynn Canal, is 9 miles long in a northwesterly direction, from Seduction Point to McClellan Flats at the mouth of Chilkat River. The arm is narrowed to 0.8 mile by Glacier Point, 2.5 miles from Seduction Point; it then expands to 2.5 miles and maintains this width for some distance, narrowing to 2 miles at its head.

Seduction Point is the southeastern extremity of **Chilkat Peninsula** which separates Chilkoot and Chilkat Inlets. Near the end is a knob, then a depression and a gradual rise to another knob, 2 miles from the point. **Dalasuga Island,** small and wooded, lies about 0.3 mile to the northwestward of the point. A rock, which bares 3 feet, lies 1 mile northwestward of Seduction Point.

The eastern shore of Chilkat Inlet is very irregular. The shoreline consists of gravel and boulder beaches with short, rocky sections. There are several bights which furnish fair-weather anchorage for small boats.

Glacier Point, on the west side of the entrance to Chilkat Inlet, is the wooded and grassy moraine of **Davidson Glacier,** which slopes uniformly back from the moraine. A flat which bares and is about 0.2 mile wide borders the western shore for 2 miles southward and the same distance westward of Glacier Point, but at the point it is only 200 yards wide. From the point to **McClellan Flats** the western shore is partly rocky, partly a boulder beach.

A ledge, which bares, extends 0.2 mile southward from the point on the eastern shore of **Kalhagu Cove.**

Kochu Island, about 2.3 miles northward of Glacier Point, is low, small, and thickly wooded. The passage between the island and the eastern shore is obstructed by a ½-fathom spot in midchannel and by a reef which extends about 0.3 mile from the eastern shore in the direction of the ledge, which extends off the southeast end of Kochu Island. **Lehunua Island,** small and wooded, lies eastward of the center of Kochu Island, close to the eastern shore of the passage. A rock, awash at half tide, is close to the northeastern end of Lehunua Island.

Letnikof Cove, on the east shore of Chilkat Inlet, about 1.6 miles northward of Kochu Island, affords anchorage for small craft, exposed to northwesterly winds near the head of the cove, in 6 to 10 fathoms.

The western entrance point to the cove is marked by **Letnikof Cove Light (59°10.4′ N., 135°23.9′ W.),** 25 feet above water, shown from a small white house.

A cannery and wharf are on the south side of the cove near the head. The wharf has a face 30 feet long with a least depth alongside of about 25 feet. Fresh water is available through a pipeline. The cannery maintains a general store and a small machine shop during the season.

Jenkins Rock, with 1¾ fathoms over it, lies 0.2 mile from the northeastern shore, 1 mile northwestward from the entrance to Letnikof Cove. Less water than is charted has been reported on this rock.

Local magnetic disturbance.—Differences of as much as 20° from normal variation have been observed in Chilkat and Chilkoot Inlets.

Pyramid Harbor is the bight in the western shore of Chilkat Inlet, about 5.5 miles northwestward from Glacier Point. The bight appears to have shoaled considerably, and anchorage is not recommended. **Pyramid Island,** midway across Chilkat Inlet from Pyramid Harbor, is grass-covered, and has shelving beaches; a spit, bare at lowest tides, connects the island with the shore a mile to the northeastward. The edge of McClellan Flats, in the mouth of Chilkat River, appears to have moved out to enclose both the harbor and the island.

Chilkat River is a shallow stream about 50 miles long, flowing in a general southeasterly direction, and at its mouth is about 2 miles wide. The mouth is so choked with sand bars as to be practically closed for anything except canoes, and the bar at low water appears as if dry clear across. The village of **Klukwan** (pop. 112; P.O.), about 25 miles from Seduction Point, may be considered the head of boat navigation, though small canoes may go somewhat farther. A highway follows the river starting from Haines.

Chilkoot Inlet, the eastern arm at the head of Lynn Canal, extends 12 miles in a northerly direction from Seduction Point, and then divides; the eastern and principal arm, called **Taiya Inlet,** trends northward for about 13 miles. Chilkoot Inlet has on its east side, and Taiya Inlet on both sides, lofty mountain glaciers in their gorges. The midchannel depths are great throughout. Katzehin River Flat and Indian Rock are the only dangers in Chilkoot Inlet.

Flat (Mud) Bay is a small, shallow cove on the western

shore 4 miles from Seduction Point; from which low land extends across the peninsula to Letnikof Cove, and is connected with Haines by a gravel road.

Katzehin River enters Chilkoot Inlet through a deep valley on the easterly side of Chilkoot Inlet, 14 miles above Eldred Rock Light. From the mouth of the river a flat, which bares to its outer edge, extends two-thirds of the distance across the inlet, and alongshore for 1.5 miles on either side of the mouth. The western edge of the flat is marked by a lighted bell buoy moored in 13 fathoms.

Battery Point, marked by a light, is on the west side of Chilkoot Inlet, 8 miles northward of Seduction Point. **Kelgaya Bay** is a small cove on the north side of Battery Point.

Portage Cove, on the west shore, about 2.5 miles northwestward of Battery Point, affords the best anchorage and shelter in Chilkoot Inlet. The anchorage is about 0.2 mile off the wharf in 12 to 15 fathoms, soft bottom. Northerly winds blow home and bring in some sea. From the anchorage the water shoals gradually to a gravel and boulder beach, which bares some distance out, and the water is shoal 200 yards offshore. A buoy is moored in 38 feet of water off **Nukdik Point,** the north entrance point.

Haines (pop. 392; P.O.) is a small town on the west side of Portage Cove. It is at the southern end of the highway running along the Chilkat River northward through the Porcupine Mining District and connecting with the Alaska Highway. An L-shaped breakwater at Haines provides a small-boat shelter. A light is at the end of the breakwater. Supplies and provisions can be obtained in limited quantities. The Alaska Communication System maintains radiotelephone contact with the other states, points in Alaska, and with western Canada. A small ferry for public use, automobiles, and freight, operates between Haines, Skagway, and Juneau. There is daily airplane service.

Port Chilkoot (pop. 120) is a village on the southwestern shore of Portage Cove, about 0.5 mile southeastward of Haines. A wharf is maintained by Haines Terminal and Highway Company. A T-head oil pipeline berth with 30 feet alongside its 160-foot berthing space, between end dolphins, is about 300 yards south of the wharf. A barge pier with gridiron, the ferry ramp, and float are between the wharf and the oil pier.

Low Point, on the eastern side of Chilkoot Inlet, 2.6 miles northeastward of Haines, is marked by a light, 35 feet above water, shown from a small red house.

Indian Rock, lying 1 mile northwestward of Low Point, is a dangerous reef, about 0.2 mile long east and west, at the eastern end of which is a pinnacle rock, awash at lowest tides. It is marked by a buoy close southward of the rock.

Lutak Inlet, the western arm of Chilkoot Inlet, is 5 miles long. **Taiya Point,** the northeastern entrance point, and **Tanani Point,** the southwestern point, are marked by private seasonal lights. At its head it receives **Chilkoot River,** a short stream which drains **Chilkoot Lake;** at the mouth of this river is a flat nearly 0.5 mile wide. Anchorage with good holding ground for large vessels can be had in a depth of 40 fathoms, about 2.5 miles from the head of the inlet to 20 fathoms about 0.8 mile from the head.

A U.S. Army POL dock, its ends marked by lights, is 0.3 mile northwestward of the light on Tanani Point. The waters in the vicinity of the oil dock have been prescribed as a **prohibited area;** for limits and regulations, see **§ 207.801,** Chapter 2. About 0.5 mile northwestward of the oil dock is a U.S. Army marginal wharf. There is reported to be 37 feet alongside its 1,000-foot face. An elevated tank, a warehouse and office, and a 30-ton stiff-leg crane are on the wharf.

Taiyasanka Harbor, about 5.8 miles northward of Battery Point, is a small harbor at the foot of the **Ferebee River** valley. The harbor has a narrow entrance that is protected from southward but exposed to winter winds drawing down the **Ferebee Glacier.** There is 12 fathoms in the narrow entrance, which is 100 yards wide and close to the west side. A spit extends over half way across the entrance from the west end of the narrow neck of land, which is the bare part of the moraine that nearly closes the entrance. The tidal currents have an estimated velocity of 3 knots in the entrance. Small craft can select anchorage near the southeast end of the basin in 8 to 15 fathoms, soft bottom.

Nahku Bay is the narrow bay between Skagway and the head of **Taiya Inlet.** Good anchorage is available in midchannel in 30 fathoms about 0.5 mile from the head. The bottom is sticky mud; it shoals gradually. During the summer with prevailing southerly winds, there is little protection from the short choppy seas coming in from Taiya Inlet.

Taiya River, at the head of Taiya Inlet, is navigable for small boats and canoes as far as high water can be carried, which is but a short distance above the mud flats. Canoes can be poled or towed by line for a greater distance.

Skagway (pop. 659; P.O.), a city on the delta formed by the Skagway River at the northerly terminus of the Inside Passage to Alaska, is essentially a transfer point between water and rail shipping routes. It is the ocean terminus of the White Pass and Yukon Route (Pacific & Arctic Railway & Navigation Company). It is also the terminus of a branch of the Canol pipeline. The principal commodities handled at the port include petroleum products, building and construction materials, provisions, and general cargo. The deepest draft of any commercial vessel calling at the port in 1959 was 32 feet.

The **Skagway River** originates in White Pass at the boundary between British Columbia and Alaska, and flows southwestward for 14 miles. Because of its shallow depths and swift currents, the river is not navigable. A breakwater extends along the southeast side of the river channel and about 525 yards across the flats.

Skagway Breakwater Light (59°26.9′ N., 135°19.2′

W.), 19 feet above the water, is shown from a skeleton tower on the northwest end of the breakwater protecting the boat harbor.

Channels.—The approach to Skagway is clear and deep. A Federal project provides for a small boat basin, protected by a rubble mound stone breakwater, and also dredging along the middle section of the White Pass and Yukon Railway wharf. In 1959 the controlling depth in the basin and its entrance channel was 11 feet.

Anchorages.—The anchorage is in the northeastern part of the harbor off the railway wharf in 30 to 35 fathoms, soft bottom. The anchorage area is small being limited by the cable area. The wind draws through the valley and anchorage. With northerly gales a vessel is liable to drag anchor because of the steep pitch of the bottom, and under such conditions a safer berth can be had at the wharf. The north side of the anchorage is formed by the flat of Skagway River, the edge of which extends eastward from **Yakutania Point.** Protection from the north can be obtained in Nahku Bay, for vessels under 200 feet in length. Large vessels can anchor in Lutak Inlet.

Tides.—The mean range of tide at Skagway is 14.1 feet and the diurnal range is 16.7 feet.

Currents.—The velocity of the tidal current ranges from 0.3 knot on the flood to 0.7 knot on the ebb. During the ebb, the current sets toward the railway wharf, so that vessels departing from the northerly half of the wharf have difficulty clearing another vessel moored at the southerly end.

Pilotage.—Pilotage is not compulsory.

Quarantine.—Juneau is the nearest quarantine station. The White Pass and Yukon Route maintains a hospital where emergency space is available . A doctor is in attendance at all times.

Customs.—Skagway is a port of entry, but marine documents must be obtained from Juneau.

Immigration and Naturalization.—A suboffice is at Skagway.

Wharves.—The railroad wharf of the White Pass and Yukon Route has a length of about 1,350 feet. In 1959 the middle 700 feet of the wharf had depths of 26 to 40 feet; 20 feet off the face; the outer 350 feet had 20 to 33 feet, and the inner 300 feet had depths of 0 to 26 feet. Float landings are off the outer side of the breakwater and in the boat basin.

Either port or starboard landings can be made at the railroad wharf, but larger vessels customarily favor the latter. Warehouse and railroad freight sheds are maintained on the wharf. Two barge terminals are on the tide flats; the one at the foot of State Street is seldom used and has not been maintained. The other, along the approach to the railroad wharf, is no longer in use, except for launching small boats.

Supplies.—A limited supply of coal is usually kept on hand. Gasoline and oil are available. Water is piped to the wharf. Provisions and some marine hardware can be obtained. A berth for beaching small vessels can be selected on the flats.

Repairs.—There is a fully equipped machine shop operated by the White Pass and Yukon Railroad, which can machine almost anything.

Communications.—The White Pass and Yukon Route is a railroad of 3-foot gage, 111 miles long, extending from tidewater up the Skagway Valley to White Pass and across the international boundary to Whitehorse, the head of navigation on the Yukon River.

Skagway has regular passenger and freight services by vessel to Puget Sound, Canadian, and Alaskan seaports. It is connected by daily plane service to the other Alaskan towns and cities. A small ferry, which hauls passengers, freight, and autos, operates between Haines, Juneau, and Skagway. The Alaska Communication System maintains telephone, radio, and cable connections with points in Alaska, Canada, and the other states.

12. WEST COAST OF BARANOF ISLAND

Chart 8252.—Baranof Island, about 90 miles long with a greatest width of about 22 miles, forms about one-third of the outer coastline of southeastern Alaska between Cape Muzon and Cape Spencer. The west coast from Cape Ommaney at Chatham Strait to Point Kakul at Peril Strait is about 80 miles. **Mt. Katlian** is in the northern part of the island. The greatest elevation is on the southern part of the island. This chapter describes, in addition to the west coast of Baranof Island, the coasts of Kruzof Island and Sitka Sound. The eastern coast of Baranof Island has been described with Chatham Strait.

Prominent features.—Vessels making the land at Cape Edgecumbe in thick rainy weather may be aided in their determination of position by the color of the rocks. The rocks and cliffs northward of Cape Edgecumbe are decidedly black in color as far as Cape Georgiana, and the rocks southward of Cape Edgecumbe are a whitish gray from Biorka Island to Whale Bay. The shore for 3 miles north of Cape Edgecumbe rises in a precipitous cliff of dark brown lava about 200 feet high and forms a prominent landmark. There are numerous large caves or blowholes to be seen in this lava cliff.

From Cape Ommaney, the western coast of Baranof Island trends northwestward to Biorka Island, a distance of 50 miles. For a distance of about 20 miles from the cape there are numerous inlets and indentations in the shoreline which as anchorages, furnish poor protection except to very small craft. The shore is of gray, storm-swept rock. From the headlands and points along the coast, the land rises to peaks and ridges in the interior of the island. The lower slopes are timbered, while the ridges and summits are snow-covered until well into the summer months. The shoreline to the northward of Biorka Island has the same general features but is of a less forbidding appearance. During foggy weather along the coast, it is often clear in Chatham Strait.

Boundary lines of inland waters.—The lines established for southeast Alaska are described in § **82.275,** Chapter 2.

Chart 8253.—Ommaney Bay is an open bight on the west side of Cape Ommaney and is of no importance to navigation. **Eagle Rocks** are a group of bare rocks close off the first point westward of Cape Ommaney.

Bobrovoi Point, about 1.8 miles northwestward of Cape Ommaney, is the southeast point at the entrance to Larch Bay. It terminates in a wooded hummock which may be mistaken for Wooden Island when approaching from northwestward.

Larch Bay is a large open bay with an arm extending in a northeasterly direction. Anchorage may be found in about 20 fathoms in this arm. Small launches use this arm during the fishing season when fair weather prevails. Rocks extend about 500 yards off the western point of the entrance to the bay. There are low depressions between the bay and Chatham Strait.

Little Puffin Bay, about 5.8 miles northwestward of Cape Ommaney, has depths of 21 fathoms at the entrance, decreasing to 7 fathoms about 0.3 mile from the head, and then shoals rapidly. At the head of the bay is a stream and a gravel beach with outcropping rocks. Exposed anchorage for small vessels may be had in 11 fathoms, rock bottom. In entering, favor the northern shore to avoid breakers off the southern shore near the entrance.

Sealion Rocks are a cluster of four dark rocks about 7.5 miles above Cape Ommaney and directly off the entrance to Puffin Bay, with several smaller outlying rocks close-to. The central rock is pyramidal in appearance with steep sides; the others are somewhat more massive. The depths are good on all sides of the rocks, but it is better to pass southward of them in entering Puffin Bay.

Puffin Bay is about 7.5 miles northwestward of Cape Ommaney. On the northwestern shore near the entrance is a massive patch of white rock. Depths in the bay range from 90 fathoms near the entrance to 40 fathoms close to the head. A small bight in the northwest shore, 1 mile within the bay, furnishes temporary anchorage with limited swinging room for small craft. The entrance to the anchorage has a depth of 11 fathoms in a channel about 60 yards wide between shoals extending from both points of the entrance. The cove furnishes little protection from southward. The small cove in the southeastern shore near the head of the bay furnishes anchorage for small craft in 6 to 7 fathoms in the middle of the cove. The very narrow entrance channel has depths of 4 fathoms. Williwaws blow with considerable force during southeasterly gales.

Driftwood Cove is a little bay 1 mile northward of Sealion Rocks; its entrance is obstructed by reefs marked by kelp patches. The cove is exposed.

Big Branch Rock is a massive, dark-colored, round-topped rock, about 1.8 miles northward of Sealion Rocks and about 1.6 miles southeastward of Redfish Point.

Redfish Cape is a narrow peninsula appearing as a comparatively low, wooded ridge, parallel to the coast; it is the only apparent low ridge in the vicinity. Coming from northward a short distance above Redfish Cape, a white, conspicuous cliff is seen in the midst of the timber. A chain of barely separated wooded islets extends 0.5 mile southward from the end of the cape; the southernmost one terminates in **Redfish Point.** Between Redfish Point and Big Branch Rock is the entrance to Little Branch Bay, Big Branch Bay, and Redfish Bay.

Redfish Breaker is 0.1 mile southward of the outer rocks southward of Redfish Point. It breaks except in calm weather. A rocky patch with a least-found depth of 3½ fathoms is about 0.5 mile 124° from the same point.

Little Branch Bay is about 1.9 miles long to the narrows, which are barely 75 yards wide, then widens into a basin. There is an island 0.4 mile southwestward of the narrows, separated from the eastern shore by a channel 100 yards wide. Midchannel depths in the bay range from 85 fathoms near the entrance to 21 fathoms off the island, 12 fathoms in the narrows, and 17 fathoms in the middle of the basin at the head. About 0.8 mile within the entrance, a narrow channel in the southeastern shore, entered only at high water, leads to a lagoon which has depths of 1 to 7 fathoms.

Little Branch Bay Light (56°18.3′ N., 134°50.6′ W.), 109 feet above the water, shown from a small white house, marks the entrance to Little Branch and Big Branch Bays.

Big Branch Bay, separated from Little Branch Bay by a high narrow neck of land, extends in a northerly direction and narrows in width 2.5 miles from the entrance, then widens again. An arm indenting the western shore about 0.9 mile from the western entrance point has depths from 9 to 20 fathoms, where small boats can find good shelter. About 2 miles from the entrance to Big Branch Bay is an islet close to the western shore. The bight on the eastern shore eastward of this islet affords indifferent anchorage in 27 fathoms. Above the narrows, depths up to 60 fathoms are found. Small boats get ice from a glacier on the east shore 0.5 mile from the head of the bay.

Redfish Bay has its entrance between Redfish Cape and **Beavertail Island.** From its entrance the bay extends in a general northerly direction, narrowing in places to 100 yards and in one place to 80 feet. The channels are probably safe but too narrow for safe steering and there is no certainty that dangers do not exist. The use of the bay by other than small craft is not recommended.

Tenfathom Anchorage, within the entrance of Redfish Bay, about 0.6 mile eastward of Redfish Cape, furnishes secure anchorage for small craft. The entrance is about 75 yards wide.

The small bay 2.6 miles northward of Redfish Cape furnishes good shelter for small boats, but the entrance is so narrow and the turns so sharp that a vessel of any size cannot enter, especially if there is any swell.

Byron Bay is 4 miles northward of Redfish Cape, and is apparently clear but too deep for secure anchorage. Indifferent, temporary anchorage may be obtained in 22 fathoms close to the western shore about 0.8 mile within the entrance. Close to the western shore, near the head, is a small island above which small craft can find anchorage. A thin, high waterfall, visible from offshore, empties into a lake northward of the bay. A flat over 100 yards wide is at the head of the bay. In entering, favor the eastern shore, which is bold and steep-to.

Kekur Point, a rounded point backed by a flat-topped ridge, is about 4.5 miles north-northwestward of Redfish Cape. **First Kekur,** a group of black rocks, is off the southern extremity of this point. A breaker over a least-found depth of 2¾ fathoms, surrounded by deep water, is 0.4 mile 306° from the First Kekur.

Chart 8254.—Snipe Bay, about 1.8 miles northward of Kekur Point, is deep and clear except for the rocks close to the shore outside the narrow entrance. The islets off the southeast entrance point are wooded. A group of rocks are close to the northwest entrance point. About 1.4 miles within the entrance in the southeastern shore is a sheltered bight with 35 fathoms in the middle. At the head of the bay are two short branches. A conspicuous waterfall empties into the head of the northwest branch. Depths of 35 fathoms were obtained in the small bight southward of the northeast branch.

Snipe Head, the northwestern entrance point of Snipe Bay, is a conspicuous straight-topped headland.

Sandy Bay, 3 miles northward of Snipe Bay, extends in a northerly direction and divides into two arms 0.8 mile from the entrance, a long narrow arm extending northward and a second arm extending eastward.

Good anchorage may be had in 22 to 24 fathoms at the northeastern head of the eastern arm off the waterfall. About 0.8 mile within the arm a group of islets extends off the northern shore. Pass well southward of these to avoid a 1½-fathom spot, not marked by kelp or showing any surface indication, which is about 0.1 mile southward of the islands. Anchorage may be had either in the bight westward of the islands or in the arm which extends north-northwestward from the northeast arm.

A 7½-fathom spot in the middle of the entrance causes the seas to pile up dangerously in southeast weather. Fish buyers anchor in both Snipe and Sandy Bays during the fishing season. All supplies for fishermen, except fresh water, are obtainable.

The **Third Kekur,** a conspicuous conical rock islet, is 1.6 miles northward of the northwest entrance point of Sandy Bay.

Close Bay consists of an open bight and a lagoon which can only be entered on the flood. Several breakers are off the northwest point of the entrance.

Whale Bay has its entrance between Point Lauder and North Cape. It extends in a northeasterly direction for about 4 miles, where it divides into two arms.

Point Lauder, low and wooded, about 15 miles north-northwestward of Redfish Cape, is the southeastern point of the entrance to Whale Bay.

North Cape, the western point of the entrance to Whale Bay, 4 miles northwestward of Point Lauder, is an island close to shore with three hills on it, the middle one being the highest.

Still Harbor, at the entrance to Whale Bay, is about 1.5 miles northward of Point Lauder. The entrance, about 0.1 mile wide, is northward of **Tikhaia Islands,** the chain of rocky islets which extends northward from Point Lauder. The northeastern shore at the entrance is foul.

About 1 mile from the entrance to Still Harbor, a group of islets and rocks extends from the southwestern shore,

restricting the channel to about 150 yards. A rocky ledge, with a least depth of 5 feet and with 1¼ fathoms at its southerly edge, extends 250 yards from the north shore toward the north point of the 30-foot island which lies close to the southwestern shore, about 1.2 miles from the entrance. The only secure anchorage is at the head of the harbor, and even here the swell is felt in heavy weather; this anchorage is not recommended.

Port Banks, has its entrance 3 miles northeastward of Still Harbor. A sunken rock on which there is a depth of 1¾ fathoms is about 0.5 mile northward off the western point of the entrance; it is reported to break in a moderate swell. Deep water surrounds this rock.

It is recommended that vessels bound for Port Banks steer midchannel courses until clear of the off-lying dangers, then head into Port Banks, favoring the eastern shore. The Makhnati Islands can usually be identified in thick weather; they furnish a good leading mark for clearing the off-lying 1¾-fathom rock. It is reported that breakers extend from this rock to the southwest point of the entrance during very heavy weather; under such conditions it is probably better to make Rakovoi Bay. After passing the 50-foot islet at the entrance to Port Banks the only obstruction is the small rocky islet, 6-foot high, 1 mile from the entrance. Pass to the eastward of this islet. About 0.5 mile beyond, the bay widens and forms a basin which has depths of 16 fathoms. Good anchorage in depths from 8 to 20 fathoms, mud bottom, may be had in Port Banks which is used extensively during the fishing season.

Kritoi Basin, between Port Banks and Rakovoi Bay, affords excellent shelter; but on account of the narrow entrance is used mostly by small craft. It is used extensively during fishing season. The entrance between **Finger Point** and **Krishka Island** is deep and clear but is only about 75 yards wide. Good anchorage in desired depths from 5 to 20 fathoms, mud bottom, can be had in the basin.

Rakovoi Bay is 1.2 miles eastward of Port Banks. An island close to the eastern point makes the channel about 275 yards wide. The channel eastward of the island is foul and suitable only for small boats. Anchorage may be found southward of the island at the entrance in about 18 fathoms or farther up the bay in 20 fathoms.

Great Arm, northeastward of Rakovoi Bay, narrows to less than 0.3 mile 5 miles from the entrance. A small bay indents the eastern shore 3.5 miles from the entrance and another at the narrows; depths of over 30 fathoms are found. Great Arm is clear; depths are too great for anchorage. **Kakovo Island** is off the northern entrance point.

Small Arm extends in a northerly direction. At its head it turns northeastward for 0.6 mile. **Makhnati Islands,** a group of wooded islands, are off the entrance to Small Arm. Anchorage may be found among them but it is exposed and not recommended. The depths in Small Arm are too great to afford anchorage. If the western shore is favored when passing the Makhnati Islands, no obstructions will be encountered throughout the length of the arm.

Necker Bay, 3.5 miles northward of North Cape, has its entrance between the Yamani Islets and the GuibertIslets. **Yamani Islets,** a group of wooded islets about 4 miles northward from North Cape, from the northwestern entrance point of Necker Bay. Good anchorage for small craft can be had northward of the islets in Yamani Cove.

Guibert Islets, consisting of three low, bare, rocky islets and several small rocks, are about 3 miles northward of North Cape and 0.5 mile off the southeastern point at the entrance to Necker Bay. A rocky patch on which 10 fathoms was found, is about 0.5 mile north of the most northerly of the Guibert Islets and in the middle of the bay; it is reported to break in extremely heavy weather. With the exception of the foregoing, deep water is found throughout the bay. About 6 miles from the entrance the bay widens and anchorage can be found in 30 fathoms on the eastern side of the bay.

Two remarkable headlands are about 2 miles northeastward of the Guibert Islets, one on either side of Necker Bay. The rocky outcrop shows well offshore and makes a good landmark.

Toy Harbor, on the southeastern shore about 5 miles from the entrance to Necker Bay, is reported to afford shelter for small boats.

Dorothy Cove, about 6 miles from the entrance to Necker Bay, affords excellent anchorage for small craft in depths of about 6 to 10 fathoms. The entrance is about 125 yards wide.

Secluded Bay is separated from the northern part of Necker Bay by a large island. The southern entrance is extremely narrow, 30 yards at one place, with least known depth of 6½ fathoms. The northern entrance, north of the island, is wider but is obstructed by a ledge which extends eastward about 100 yards from the northern point of the island, leaving a clear channel of about 100 yards with a depth of 3½ fathoms. A large stream enters the northern part of the bay and an extensive flat strewn with boulders makes off the mouth of this stream. Anchorage may be found in 17 fathoms in the northern part of the bay off this stream and small craft can find anchorage in 6 fathoms in the southern part of the bay.

A small bay extends from the head of Necker Bay where anchorage may be found in 20 fathoms.

Slate Islets, a group of rocky islets, parallel the shore between Necker Bay and Crawfish Inlet. One of the southern islets has a few trees on it. Between the islets and the main shore is deep water, but many rocks make navigation without local knowledge dangerous.

Chart 8255.—Crawfish Inlets, with entrances 6.5 to 11 miles northwestward of North Cape, consist of two principal arms connected 5 miles inland by Cedar Pass. The inlets and entrances are deep and clear, but between the two principal entrances are off-lying dangers.

Walker Channel is the southern entrance to Crawfish Inlet, and **Aspid Cape,** low and wooded, forms the southern point at the entrance.

Jamboree Bay, with a depth of 5½ fathoms in the entrance, extends southeastward from the head of Walker Channel. In entering, keep in midchannel, and anchor

near the head of the bay in 10 to 17 fathoms with good holding ground. Southeast winds sweep through the anchorage with considerable force.

Rakof Islands are a group of wooded islands lying between Walker Channel and the entrance to West Crawfish Inlet. **Beauchamp Island,** the largest island of the group, forms the northwestern side of Walker Channel. **Scow Island,** the southwesterly island of the group, is westward of Beauchamp Island.

Scow Bay indents the western shore of Beauchamp Island, and is much used by local fishermen as an anchorage. Favor the southeastern shore throughout, passing southward of all the islands near the entrance. When passing through the narrows leading into the basin at the head of Scow Bay, keep as close as possible to the south shore, especially at low water. There is good anchorage off the cabin on the north shore of the bay in 10 fathoms, mud bottom; also in the basin in 2½ to 3¼ fathoms, mud bottom.

Middle Channel is a passage leading to Crawfish Inlet from the sea, midway between Walker Channel and West Crawfish Inlet. A course from southwestward, passing close to the northwest side of Scow Island, will lead clear of the off-lying rocks up to this entrance. One mile inside this entrance, near midchannel, is a sunken rock with 1½ fathoms over it and marked by kelp, which should preferably be passed to the southward.

Biali Rock, bare and white in color, is the extreme western islet of a chain of bare islets extending westward from Rakof Islands. Foul ground extends for about 1 mile southward and eastward of the rock. **South Rocks** are a group of rocks, awash at high water, lying near the southeastern limit of the foul ground.

An inside passage furnishes protection for small craft bound for Sitka. Pass eastward of Scow Island, avoiding the rock in midchannel, and through **Cameron Pass.** Favor the southeast shore of Middle Channel until up to **Second Narrows.** Pass eastward of a large rock off the point, then favor the south shore and take a midchannel course through the narrows. A shoal of 2½ fathoms is in Second Narrows. Head northward until up to an opening leading northwestward. Favor the east shore of this opening past a rock near the shore avoiding a sunken rock in the center. Then head northward for about 0.5 mile and turn westward around a point, passing in midchannel through **First Narrows.** Cross West Crawfish Inlet and enter Windy Passage.

Crawfish Inlet is deep and clear except for a rock that uncovers 3 feet in midchannel, 8 miles from the entrance. The inlet can be entered from seaward through Walker Channel or Middle Channel, the former being the safer.

Cedar Pass, connecting Crawfish Inlet with West Crawfish Inlet, is suitable only for small craft. In using the pass, favor the west shore up to the narrows then keep a midchannel course. **Lodge Island** is the large island which forms the western side of Cedar Pass.

West Crawfish Inlet extends northeastward for about 8 miles where it divides into two arms. The northern arm, opposite Cedar Pass is clear in midchannel except for a landslide shoal with 4½ fathoms over it which lies off the western shore about 0.8 mile from the entrance. **Shamrock Bay** leads eastward from a point near the head of the inlet. The inlet and bays are too deep for good anchorage.

Necker Islands are a group of low, wooded islands extending northwestward from the entrance to West Crawfish Inlet. Between the islands are many passages. An inside passage for small craft leads through Windy Passage, Dorothy Narrows, and Hot Springs Bay, which lie between the islands and Baranof Island.

The most prominent landmark in the Necker Islands is **The Beehive,** a knob 430 feet high at the southwest end of **Golf Island,** the long narrow island westward of Gornoi Island.

Rachek Island is the fairly large, wooded island at the south end of the Necker Island group. It has high, light-gray cliffs on its seaward side. There is clear water to the southwestward of this island.

North Rock is an isolated, black rock, block-shaped, awash in a heavy sea, 1.4 miles west-northwestward of Rachek Island. Fishermen trawl a great deal southward of this rock.

John Rock is the large, light-gray rock, 2 miles northwest of North Rock. Broken ground, with several isolated breaking shoals, lies between North Rock and John Rock.

Windy Passage is the south approach to Hot Springs Bay from West Crawfish Inlet. A midchannel course is clear.

President Bay is at the southeast end of Windy Passage. Entrance can be made on either side of the wooded islands which lie in the entrance, by keeping in midchannel. Good anchorage is afforded small craft in mud bottom, well toward the head of the bay. A basin at the head of the bay is accessible only to skiffs.

Sevenfathom Bay, the middle bay, affords better anchorage than President Bay. Keep in midchannel until near the head of the bay, then avoid a ledge that uncovers 8 feet which is off the southern shore near the head of the bay, which also has a sand flat 100 yards wide which bares. Good anchorage for small craft in 5½ to 8 fathoms, mud bottom, can be found in the bay.

Big Bay, at the northwest end of Windy Passage, is narrow at the entrance, with greatly increased width inside. Anchorage is good in 5 to 10 fathoms, mud bottom, 0.3 mile off the stream at the southeast end of the bay.

Dorothy Narrows, between Windy Passage and Hot Springs Bay, has ½ fathom of water at lowest tides. Elovoi Island Rock, which uncovers 3 feet in midchannel north of the narrowest part, is marked by a daybeacon. Coming from the south keep midchannel through the narrowest part, then swing right to avoid the rock. When past, swing left to avoid another rock awash at half tide, 250 yards northeastward of the daybeacon. Local knowledge is essential.

The passage between **Gornoi Island** and the group of islands southeastward of it, is clear except for a rocky islet and two rocks awash off the southeastern side of

Gornoi island. To avoid this danger, keep close to the southeast shore. Do not use this passage to reach the outside on account of offshore rocks.

The passage between Gornoi Island and Golf Island is very foul and should not be used.

The passage along the west shore of Golf Island, between this island and the **Jackknife Islands,** has good water close along the shore of Golf Island. A foul area is northeastward of the Jackknife Islands. The shoals westward of the south end of Golf Island break in a slight swell.

The passage between the Jackknife Islands and **Elovoi Island** is clear if vessels keep close to Elovoi Island, passing west and north of the wooded islet 0.3 mile westward of the north end of Golf Island.

The passage between **Legma Island** and **Maid** and **Tava Islands** is clear in midchannel. Small craft can pass between Maid Island and Tava Island with local knowledge.

The passage between **Torsar Island** and **Fragrant Island** is dangerous and should not be used except by those with local knowledge.

These passages are for small craft only and should be used with caution. The only ship route into Windy Passage is through West Crawfish Inlet.

The best route into Hot Springs Bay from the south or southwest is to pass 0.4 mile eastward of North Rock in a northerly direction, passing westward of Elovoi Island and the three small wooded islands 300 yards off its shore and eastward of Fragrant Island. Keep midway between visible objects.

Herring Bay indents Elovoi Island. The approach westward of **Kirbas Island** is not passable. In entering by the approach eastward of Kirbas Island pass westward of a bare 20-foot rock off the east point of the entrance and follow midchannel. Excellent anchorage can be had for small craft in 3 to 4 fathoms, mud bottom.

Biorka Island is the most westerly and largest of the Necker group. **Point Woodhouse,** the southern point of the island, is moderately high and wooded. Rocks and islets are close to the point. Three of the islets are named, **Kaiuchali, Terbilon,** and **Impassable Islands.**

Little Biorka Island is northwest and close to Biorka Island with a narrow passage between. This pass is foul, but in good weather small boats can use it with local knowledge. The southern neck is a bare, rugged rock cliff. The western and northern sides are bare rock cliff. This island is wooded in its center. A bare islet is at the southern point.

Vasilief Rock, awash at high water, is about a mile southward of Point Woodhouse. Breakers are reported visible in this section in rough weather.

Golovni Island has two parts, the inshore half being high and wooded; the outer half being a high, bare, gray rock, rounded on top, with a perpendicular south face.

Jacob Rock, about 0.8 mile southward of Golovni Island, is a large outstanding rock of drak-gray color.

Biorka Channel, southeastward of Biorka Island, furnishes a short route into Sitka Sound from the southwest. Vessels should keep between the 50-fathom curves on entering from southward until past the north end of Wrangell Island, then head north. This channel is clear except for rocks and shoals as indicated on the chart. The velocity of the current is about 0.4 knot. Predictions may be obtained from the Tidal Current Tables.

Gunboat Rock, about 1.2 miles northeastward of Vasilief Rock, which has two pinnacles, and looks like a gunboat when seen from certain directions, makes a good landmark. A small reef, awash, which breaks in all but dead calm weather at high water, is about 0.5 mile 198° from Gunboat Rock. Depths of 3¾ and 8½ fathoms are 0.6 and 0.7 mile southeastward and on the opposite side of the channel from Gunboat Rock. Broken ground with rocks awash extend 0.3 mile northward of Gunboat Rock.

Symonds Bay is the eastern cove indenting the north side of Biorka Island, and is sometimes a convenient anchorage for small vessels deterred from entering the sound by thick weather. **Entrance Islet** is northward of and close to the western point of the entrance.

Hanus Islet is northward of and close to the eastern point of the entrance. The depths range from 20 fathoms at the entrance to 5 to 6 fathoms at the anchorage near the head of Symonds Bay. Dangers in the bay are shown on the chart.

The bay is open northward, but affords anchorage with shelter from southerly winds, sand and shell bottom. The best shelter is near the head inside the ¼-fathom rock in 5 to 6 fathoms, but it is suitable only for small craft. Large vessels should anchor in midchannel just inside the entrance in 12 to 13 fathoms. A small wharf, 16 feet wide and 178 feet long with 5½ feet along the face, is on the west side near the head of the bay.

Biorka Reef is 1.2 miles 282° from the southernmost point of Little Biorka Island. It is a sunken rock, nearly awash, with deep water around it, and breaks in moderate weather; it has no kelp. The channel between the reef and Little Biorka Island is 1 mile wide, clear, and practicable for vessels of any size.

Hot Springs Bay is between the northern Necker Island and Baranof Island. **Torsar Island** marks the northwest point of the entrance to the bay. **Fragrant Island** is the large island southeast of Torsar Island. **Kolosh Island** is the large island on the north side of the bay. An abandoned saltery and small wharf are at the south end of the sand beach on the east side of the island.

Goddard, at the hot springs on the northeasterly side of the bay, has a hotel, and health resort, and regular communication with Sitka. The hot springs have a temperature of about 145° F., and the water contains sulphur, chlorine, iron, and magnesia. The landing float on the north side of the point west of the hotel has a least depth of 25 feet.

Chart 8252.—Sitka Sound has its entrance from sea between Biorka Island and Cape Edgecumbe. It extends in a northerly direction about 14 miles, with a width east and west of 7 to 10 miles. The east and north shores are fringed with numerous islands and rocks and indented

by bays and inlets. At its north end, the sound connects with several bays and estuaries extending northward, and with Olga Strait, which is part of a navigable inland passage connecting Sitka Sound through Neva and Peril Straits with Chatham Strait. The shores are wooded, rendering it difficult to distinguish from a distance the wooded islets when they are close to the land, which usually rises rapidly a short distance from the sea, culminating in broken mountains. The islands are mostly small, low, and sparsely wooded.

Chart 8256.—Cape Edgecumbe, the southwestern extremity of **Kruzof Island,** is formed by a cliff of black lava, about 100 feet high. Foul ground extends 300 yards off the shore of the cape and there are banks with depths of 8 to 9 fathoms, about 0.8 mile southward of the cape, on which the sea breaks in very heavy weather. The rocks and cliffs northwestward of Cape Edgecumbe are decidedly black in color as far as Cape Georgiana, while those southward of Cape Edgecumbe, from Biorka Island to Whale Bay, are whitish-gray, and this characteristic is of considerable assistance in identifying the locality when making the coast in thick weather.

Cape Edgecumbe Light (56°59.9′ N., 135°51.3′ W.), 100 feet above the water and shown from a small red house, marks the north side of the entrance to Sitka Sound. A 19-fathom bank about 4.5 miles 214° from Cape Edgecumbe, on the range, St. Lazaria Islands slightly open of Shoals Point.

Sitka Point, about 1 mile eastward of Cape Edgecumbe Light, is marked by a daybeacon. Foul ground extends about 0.3 mile southward from the daybeacon and for about 0.2 mile westward of Cape Edgecumbe Light. Outside of these reefs the water is clear. Fishing vessels frequently anchor on the eastern side of Sitka Point close inshore and northward of the reef, marked by kelp, extending 300 yards off the eastern side of the point. This anchorage is exposed in easterly or southerly weather.

Mount Edgecumbe, on Kruzof Island, is the prominent landmark for Sitka Sound. From any point seaward, it is easily distinguished by its isolated position, its flat top, its peculiar streaked appearance, and its reddish color. The upper part is a bare volcanic cone, usually snow-covered. Extending down the sides of the cone are numerous deep gullies or ravines, in which the snow lies until late in the summer, giving it a peculiar appearance. The crater is from 300 to 400 feet deep.

St. Lazaria Islands, about 1 mile off the southern shore of Kruzof Island, form the St. Lazaria National Wildlife Refuge. These islands are of a peculiar volcanic formation and are frequently visited by tourists. Deep water is close-to on all sides of the islands except for a reef extending 125 yards off the northeastern point of the easternmost island. Small craft frequently anchor close inshore on the northern side of the island in 8 to 10 fathoms, rocky bottom, which affords protection in moderate southerly weather.

Low Island is a bare flat island surrounded by a large area of shoals and breakers marked by kelp, extending to Shoals Point. The highest part of the island is only 7 feet above high water and is swept by heavy seas in southerly storms. The island is of lava formation partly covered by sand and shells and is difficult to identify at a distance.

Chart 8255.—Vitskari Island is a bare rock about 20 feet high, about 5.4 miles eastward of St. Lazaria Islands and is marked by **Vitskari Island Light (57°00.0′ N., 135°32.6′ W.),** 50 feet above water and shown from a small white house on a skeleton tower.

Vitskari Rocks are a group of bare rocks northward of Vitskari Island. Between the rocks and Low Island is a channel 1 mile wide; however, the channel between the rocks and Kulichkof Rock is always used by vessels bound for Sitka.

Camel Mountain, about 1.5 miles northward from the hot springs on the east side of the sound, is a prominent landmark with two humps at its summit. When seen from westward it shows a perfect cone-shaped outline.

Peisar Island is about 2.5 miles northeastward of Biorka Island. Rocks lie 0.2 to 0.5 mile offshore.

Viesokoi Rock is about 0.7 mile southeastward from the southern extremity of Peisar Island.

Kanga Bay, the entrance to which is about 1.8 miles eastward of Peisar Island, has depths of 11 to 18 fathoms in the inner bay. The channel passes northeastward of the small islet lying about midway between the entrance and the head of the bay. Foul ground extends 0.2 mile in a northeasterly direction from the south point of the entrance to the bay.

Redoubt Bay is northeastward of Kanga Bay. The head of the bay has two arms which are deep. **Redoubt Lake** empties into the eastern arm. The entrance to Redoubt Lake is not navigable by any type craft, as there are the remains of a rock dam across the entrance and the lake level being about 9 feet above high water level of the bay, the three outlets from the lake have very steep rapids. A boat skid has been built along the north side of the northern outlet by which a small boat could be manhandled into the lake.

Islet Passage, in which depths of 11 to 20 fathoms are found, leads from Kanga Bay to Redoubt Bay. **Fankuda Islet** is at the northern end of the passage. Soundings of 18 fathoms were found westward of the islet and 13 fathoms in the channel to the eastward. Various channels lead into Redoubt and Kanga Bays through the numerous wooded islands off the entrances; these are shown on the chart. A daybeacon on a rock awash, about 0.4 mile westward of **Round Island,** marks the west side of **Koka Island Passage** which is part of the inside route for small vessels between Sitka and Hot Springs Bay. **Kita Island** is the outermost of the larger islands of the group off **Povorotni Point,** which is low and wooded.

Many islets and rocks are offshore between Povorotni Point and Cape Burunof. Sunken rocks are nearly 0.5 mile westward of Cape Burunof. The entire area of rocks and islets should be navigated with caution. The latest edition of the chart should be used.

Vasilief Bank, marked by two rocks which uncover 10

feet, 0.5 mile apart and awash at high water, is about 1.5 miles westward of Povorotni Point.

Local magnetic disturbance.—Differences of as much as 4° from normal variation have been observed on **Obsechki Island,** which is about 1.2 miles northwestward of Povorotni Point.

Kulichkof Rock, steep-to and bare, is about 2.2 miles northward of Vasilief Bank. It is a prominent landmark. A small group of rocks, awash at high water, is about 0.2 mile northward of the rock, and 0.2 mile westward is a rock covered 1 foot which breaks in a moderate swell. Rocky patches, marked by some kelp at low water, are charted eastward. A lighted whistle buoy, about 0.5 mile north-northwestward from the rock, marks the east side of the main channel to Sitka.

Zenobia Rock, with 2¼ fathoms over it, is about 2 miles east-northeastward of Kulichkof Rock and nearly 1 mile west-southwestward of **Liar Rock,** the westernmost rock of The Eckholms.

The shoreline from **Caution Island** northward to Deep Inlet is rocky with heavy spruce timber growing to the storm high-water line. Many off-lying islets, and rocks, awash and sunken, are found along this coast, making it dangerous to traverse without local knowledge. A pass, carrying 1 fathom at low water, is used by small boats and fishing craft between Povorotni Point and the islets off it, but should not be attempted without local knowledge.

Three Entrance Bay, the long narrow shallow bay south of Cape Burunof with three entrances, is a protected anchorage for small boats, but is very little used. The north entrance is the best and will carry 1 fathom. In westerly weather all entrances are exposed to the open sound. Caution—do not use without local knowledge.

Pirate Cove, the first cove east of Cape Burunof, is a protected anchorage at the head but is constricted and shoal. Two to three small boats can anchor.

Samsing Cove, the second cove east of Cape Burunof, is a well-protected anchorage for small boats with easy access from the west side and good holding ground of mud and sand in 3 to 8 fathoms.

Sandy Cove, the cove southwest of the entrance to Deep Inlet, is a protected anchorage for small craft in 7 to 9 fathoms, mud and sand bottom.

The Eckholms are a small group of islets and bare rocks; the easternmost islets are wooded. A light, 33 feet above the water and shown from a white wooden house, marks the islets. The **Belknap Islands** are southeastward of The Eckholms.

Deep Inlet, the narrow entrance of which is southeastward of The Eckholms, has no anchorage. A large flat rock with ¾ fathom over it, is on the southern side and partly blocks the entrance.

Aleutkina Bay, northeastward of the entrance to Deep Inlet, offers fair anchorage in 15 to 17 fathoms, mud bottom. The bay has two entrances. The west entrance, between **Emgeten** and **Error Islands,** is clear and a midchannel course will lead to the anchorage. The east entrance is between **Fassett Island** and **Silver Point** and a midchannel course will likewise lead safely to the anchorage.

Leesoffskaia Bay affords anchorage for small vessels in any desired depth. The entrance is about 250 yards wide. Vessels desiring to make use of this well-sheltered anchorage should follow the northern shores close-to in order to avoid the extensive sand and mud flats bordering the southern shores. The bottom is mud in the middle of the bay but rocky near the shores.

Camp Coogan Bay, on the southeastern side of Eastern Channel, has a narrow but clear entrance, and a landlocked anchorage inside for small vessels in 7 to 12 fathoms, mud bottom. Several streams enter at its head, where a flat makes out nearly 0.2 mile. Log storage booms are on the northeast side of the bay near the head and across the head of the bay about 300 yards out.

No Thorofare Bay, north of Camp Coogan Bay, is composed of two landlocked bodies of water connected by narrow, shallow channels. Only small boats can enter and then only at high-water slack because of strong currents in the outer narrows. Shoal depths of ¾ fathom are off the entrance and in the outer narrows, and a rock awash at high water is on the south side of the outer narrows near the inner end.

Tides.—High water occurs ¾ hour later than high water at Sitka; low water occurs 2½ hours later; for high water heights subtract 3.8 feet from the high water height at Sitka.

Birdsnest Bay is a small shoal bay between Camp Coogan Bay and No Thorofare Bay. A small foul passage connects with Camp Coogan Bay, but can be used only by small boats at half tide or more. Caution—use only with local knowledge.

Silver Bay, at the eastern end of Eastern Channel, extends in a northeasterly direction for 0.8 mile, then southeastward for 4 miles. Lights on **Entry Point** on the north side, and on **Sugarloaf Point** on the south side, mark the entrance to the bay.

Sawmill Cove, at the northerly end of the bay, has a large pulp mill with a 600-foot wharf with 35 to 38 feet alongside, and a smaller 200-foot wharf with 38 feet alongside; both wharves are of steel and concrete construction. There is also a railroad ferry landing about midway between the two wharves, and a log elevator at the head of the cove. There is a least depth of 33 feet near the middle of the cove.

Herring Cove is on the north side of Silver Bay, about 1.5 miles within the entrance. A log storage boom surrounds the cove close to shore. Small vessels can find constricted anchorage in the cove in depths of 14 to 15 fathoms, mud bottom, but should pass with caution the 1½-fathom spot in the middle of the entrance.

On the southwest side of the bay, opposite Herring Cove, another log storage boom close to shore extends about 0.6 mile southeastward from the point north of Sugarloaf.

Bear Cove is on the east side of Silver Bay, halfway up the southeastern arm. Anchorage in 23 fathoms can

be had in the cove, but the swinging room is constricted.

Arguello Island is a small island on the south side at the head of Silver Bay. Anchorage in 15 fathoms can be had west of the island. Enter to the west of the island as a 1¼-fathom shoal is in the middle of the passage south of the island. Small vessels can anchor in 16 to 20 fathoms just below the waterfall at the head of the bay.

Chart 8244.—Sitka Harbor and approaches.—The greater part of the approaches to Sitka Harbor covers the northeastern side of Sitka Sound. The area is reef studded, with numerous wooded islands, and isolated shoals. These are charted and, lacking outstanding or prominent features, need no detailed description. The principal islands in the approaches or at the turns in channels are marked by lights; the reefs and shoals in way of the channels are marked by buoys. The harbor is easy of approach and with due attention to the chart and by following the aids, the navigator should have little difficulty in entering in clear weather.

Japonski Island, the largest island in the approaches to Sitka is wooded. Wharves are along the east side of the island. **Mount Edgecumbe** (pop. 1,884; P.O.) is an unincorporated community on the island. There is a hospital of the Alaska Native Service and a large school with the necessary housing for students and staff.

Makhnati, Mogilnoi, Kirushkin, Sasedni, Gold, Virublennoi, Reshimosti, and **Nevski Islands,** all southwestward of Japonski Island, are connected to it by a solid fill. **Charcoal, Alice,** and **Fruit Islands,** on the south side of Japonski Island, have also been connected to it by solid fill, and form the western and southern sides of a shallow basin off the southeastern end of the island. **Harbor Island** and the fill connecting it with Japonski Island form the east side of the basin.

Channel Rock Light (57°03.6′ N., 135°22.1′ W.), 25 feet above the water and shown from a small white house on a skeleton tower on a concrete base, is on the rock which is almost in midchannel, at the north entrance to Sitka Harbor.

Shoal Island Light (57°02.9′ N., 135°20.4′ W.), 19 feet above the water and shown from a small white house on a skeleton tower, is on a concrete base on the northernmost of a group of three rocks, southeastward of Harbor Island. This light marks the southern entrance to Sitka Harbor.

Sitka (pop. 3,237; P.O.), the site of an early Russian settlement and once the capital of Alaska, is on the eastern side of Sitka Sound. Two oil companies, a sawmill, two canneries, and a cold storage plant are here. Sitka also has an Indian industrial school and home, a native village, a National Military Cemetery, and a National Monument.

Channels.—From the sea, three natural channels lead to Sitka among islands and reefs on the northeastern side of Sitka Sound. **Eastern Channel** is the widest and main entrance; the principal dangers are marked by buoys. **Middle Channel** has its entrance between Kayak Islands and Passage Islands; it is not recommended. **Western Channel** is used by vessels entering from the sea and desiring to go alongside a wharf heading southeastward; the channel has its entrance westward of Makhnati Island.

A Federal project provides for a channel 22 feet deep and 150 feet wide on the easterly side of Harbor Rock. The channel marked by lighted buoys on the westerly side of Harbor Rock has a controlling depth of about 26 feet and a width of about 120 feet.

Dangers.—There are numerous rocks, reefs, and shoals in the approaches to Sitka Harbor, all of which are charted; most are unmarked but the principal ones adjacent to or in the three channels are marked.

Passage northward of Simpson Rock and Tsaritsa Rock should be avoided on account of the numerous obstructions southward of Kayak, Whale, and **Bamdoroshni Islands.**

Middle Channel has numerous shoals and dangers and should be used only by small vessels with thorough local knowledge. The passage between Kayak Islands and Whale Island is foul and the bottom very irregular. A ¾-fathom depth is near the center of this passage.

Caution.—After passing Harbor Rock, boulders with 3 fathoms lie 31 yards 281° from the northwestern corner of the Pyramid Packing Company wharf. A boulder with 2¾ fathoms over it lies 66 yards 169° from the opposite corner of this wharf. The boulders are close to and eastward of the courses followed by ships.

Anchorages.—Anchorage in 12 to 14 fathoms, mud bottom, can be had at the **Eastern Anchorage** about 0.25 mile east-northeastward of Turning Island and about 0.4 mile east-southeast of the Standard Oil Company wharf. The swell from outside makes this anchorage uneasy in southerly weather.

Anchorage can also be had at the **Western Anchorage,** eastward of Channel Rock, but it is not very convenient because of its distance from the landing.

During the winter months northeast gales sometimes sweep across the Eastern Anchorage with considerable force and render it rather unsafe. In southerly gales the sea is considerably felt at both the Eastern and Western Anchorages.

Whiting Harbor, westward of Japonski Island, affords anchorage in about 12 fathoms, mud bottom, with the southwest tangent of Japonski Island bearing 110°, distant about 500 yards, and the group of bare, rocky islets of the west shore of Japonski Island bearing 20°. This anchorage is exposed to westerly and northwesterly winds and swells and is seldom used, as most vessels prefer the Eastern Anchorage at Sitka.

Jamestown Bay, about 1.5 miles eastward of Sitka, affords anchorage in 9 to 12 fathoms, mud bottom, about 400 yards offshore and 300 yards westward of the rocks, awash at high water, in the northeastern part of the bay.

There are other anchorages which may be used by large ships, and many others are suitable for small fishing vessels and other small craft, provided local knowledge is obtained regarding off-lying rocks and dangers. One of the best ship anchorages is just off the channel courses

for the northwest approach to Sitka. The average depth is 8 fathoms, mud bottom, with Chanel Rock Light bearing 289°, distant about 0.2 to 0.3 mile.

Tides.—Daily tide predictions for Sitka are given in the Tide Tables.

Currents.—In the open sound the tidal currents are weak and somewhat rotary turning clockwise. Among the islands stronger currents may be expected.

In Sitka Harbor the flood sets northwestward and the ebb southeastward. Velocities are small. In midchannel off the wharves velocities of 0.5 knot were observed. For daily predictions, see the Tidal Current Tables.

Winds.—The following observations relative to winds are from an early report.

When at the anchorage at Sitka, if the winds blow east-northeast and no breakers are visible on Vitskari and Kulichkof Rocks, the wind outside will be found to come from the southeast or northeast, but probably the latter. On the other hand, if the surf be visible on these reefs, when the wind at the anchorage is east-northeast the wind outside and within the sound as far easterly as Vitskari Rocks will be found to proceed from the south or west, and it is not advisable for a sailing vessel to attempt to go to sea.

In the spring and summer, when easterly winds prevail outside, they are nearly always found to blow northwest inside the sound.

Quarantine.—The nearest quarantine station is at Juneau. The Alaska Native Service has a large well-staffed hospital on Japonski Island. These facilities are available to the public for emergency cases.

Customs.—Sitka is a port of entry and marine documents are issued.

Wharves.—The depths at the wharves along the Sitka waterfront vary from 16 to 27 feet and those at the floats vary from 9 to 18 feet. The larger wharf on Japonski Island has a depth of 40 feet alongside. There are small-craft basins on both sides of the harbor. A small boat harbor protected by an L-shaped breakwater, marked by a light, is at the north end of the harbor, about 0.2 mile northward of Harbor Rock. Depths in the boat harbor range from 6 to 30 feet alongside the finger floats.

Supplies.—Provisions, fishing supplies, and a limited amount of marine hardware can be obtained at several stores. Fresh water is available at all the wharves. Diesel oil, gasoline, and lubricating oils are available at the oil wharves.

Repairs.—Limited repair service to machinery of vessels is available. Along the waterfront are several grids where small boats may be repaired. Refer to Chapter 3 for information about marine railways in Alaska.

Communications.—Sitka has regular passenger, express, and freight service by ship to Puget Sound, Canadian, and Alaska seaports and towns. Airlines carrying passengers and mail connect Sitka with Juneau and Ketchikan. The Alaska Communication System maintains radiotelephone and radiotelegraph connections through Juneau with points in Alaska and the other states as well as points in Canada.

The **National Military Cemetery** is about 0.2 mile northward of Crescent Bay.

Sitka National Monument, 57 acres in area, is on the peninsula west of **Indian River.** It is the site of Indian stockade where the Kik-Siti Tribe made their last stand against the Russian settlers.

Chart 8281.—Watson Point is on the eastern side of the northern approach to Sitka Harbor, about 0.9 mile northwestward of Harbor Rock. A rocky ledge extends about 150 yards off the point. When approaching Sitka Harbor from the northwestward, care must be exercised to give this point a berth of about 300 yards, and passing about 50 yards westward of the lighted buoy about 300 yards southward of the point.

Kasiana Islands are a group of islands on the western side of the northern approach to Sitka Harbor. A reef, well marked by kelp, extends about 0.6 mile southeastward of the easternmost island and terminates in a rock awash, which is on a line from the eastern tangent of the islands to the middle of Battery Island and nearly midway between them.

Halibut Point, on the east side of the channel, is about 1.4 miles northwestward of Watson Point.

Old Sitka Rocks are a group of eight rocks which bare at all stages of the tide and extend 0.5 mile from the eastern shore. The northern and largest one has two or three scraggy trees and the rest are bare. The westernmost rock of the group covers only at highest tides and is marked by **Old Sitka Rocks Light (57°06.9′ N., 135° 24.6′ W.)**, 36 feet above the water and shown from a white house on a horizontally slatted skeleton structure. The main channel is westward of Old Sitka Rocks, but a narrow channel lies between them and an island near the shore. The shore from Old Sitka Rocks to Western Anchorage should not be approached closer than 300 yards.

The channel passing westward of Old Sitka Rocks and eastward of Middle Island and Kasiana Islands is the main channel for all vessels southbound for Sitka via the inside route. This route contains deep water and the only danger is a 5-foot rocky shoal, marked by a buoy on its eastern side, about 0.6 mile southwestward of Halibut Point.

Starrigavan Bay (Old Sitka Harbor) is a bight, open westward, on the east side about 1.5 miles northward of Old Sitka Rocks, and just southward of the entrance to Katlian Bay. Some Indian shacks are on the point dividing the two coves on the east side of the harbor. The north cove is filled by a flat, and a rock which bares is 150 yards off the north shore westward of the end of the flat. The anchorage is abreast the south cove, about 400 yards from shore, in 18 to 20 fathoms, soft bottom. Westerly winds and some sea have a fair sweep into this bay.

Katlian Bay has its entrance nearly 2 miles northward of Old Sitka Rocks and extends in a northeasterly direction, curving east near its head. There are no dangers except a flat which extends 0.2 mile from the head of the bay. At 2.5 miles within the entrance to the bay an arm

extends northwestward; fair anchorage can be had in this arm northwestward of the group of islands on the north side in 11 to 20 fathoms, and very small vessels can anchor in **Cedar Cove**, the narrow part at the head of this arm, in 5 to 10 fathoms.

Promisla Bay, on the northwest side of Sitka Sound 2 miles westward from **Siginaka Islands**, indents the southeast shore of Krestof Island. There is a small wooded island in its entrance with a bare rock 0.2 mile eastward of the island. The depths in the bay range from 15 to 20 fathoms, and a fair anchorage can probably be had near its head in 16 fathoms, mud bottom, with good protection in almost any weather.

Olga Strait, between **Krestof** and **Halleck Islands**, is 4 miles long in a northwesterly direction, with an average width of 0.2 mile, and forms a part of the inside route from Sitka to Salisbury Sound. It is in general clear, with a controlling depth of 5 fathoms in midchannel. A vessel can anchor anywhere in its length. On both sides of the channel are small flats where streams empty and the shores are fringed with kelp except off these flats. In Olga Strait the current sets northwestward on the flood and southeastward on the ebb. Off **Creek Point** the velocity is 1.6 knots on the flood and 1.2 knots on the ebb. For daily predictions, see the Tidal Current Tables. About 100 yards off **Eastern Point** is a rock with a least depth of 5 feet. About 0.8 mile within the southern entrance is a shoal about 175 yards across with a least depth of 20 feet, marked by a buoy. It extends about one-third the way across the channel from the western shore. Scattered kelp grows all over the shoal.

Middle Shoal is 2.2 miles from the southern entrance to Olga Strait, midchannel between two small streams, one on each side. It is 400 yards long in the direction of the channel, with lumps having 18 to 22 feet over them. At each end of the shoal is a buoy, the northern one lighted. Kelp grows all over the shoal, but usually shows only at slack water.

Nakwasina Sound separates the east side of Halleck Island from Baranof Island. It extends from the south entrance of Olga Strait in a general northeasterly direction and connects with Nakwasina Passage. The sound is contracted at its southern end to about 0.2 mile by **Crosswise** and **Beehive Islands.** Small vessels can anchor in the cove westward of Beehive Island in 5 to 6 fathoms.

Nakwasina Passage separates the north side of Halleck Island from Baranof Island. It has a northeasterly direction from the northern entrance of Olga Strait. The western part of the passage is about 0.8 mile wide, with 15 to 20 fathoms, affording anchorage. The navigable channel is winding and constricted in places to 30 yards by extensive flats. The limits of the channel are distinguishable at low water. The controlling depth in the best channel is about 10 feet; this passage is suitable only for small craft. In Nakwasina Passage the currents are, in general, too weak or variable to be predicted. However, in the channel about 1.5 miles west of **Allan Point**, the current velocity is 2.0 knots on the flood and 1.6 knots on the ebb. For daily predictions, see the Tidal Current Tables.

Krestof Sound is westward of Krestof Island and connects Neva Strait with Sitka Sound, through Hayward Strait. **Sound Islands** are at the northeastern part of the sound. The sound is out of the line of travel and is of no commercial value. At its northwest end the sound connects by a high-water passage with Sukoi Inlet. At its south end the sound is filled by **Magoun Islands**, with a narrow channel east and west of them and a boat channel through them. **East Channel** is clear in midchannel; the dangers are shown on the chart. **West Channel** should not be attempted except by small craft.

De Groff Bay opens northward of East Channel; its entrance is narrow, has a depth of 3 fathoms 4 feet, is overgrown with kelp, and should only be attempted by small craft. **Port Krestof** is a broad bight on the south side of West Channel; an anchorage can be had in 7 to 15 fathoms, taking care at high water not to get on the flat which fills the south end of the port to a distance of 0.5 mile out to an islet 12 feet high. A better anchorage can be had in **Mud Bay**, west of the Magoun Islands, taking care to avoid the 3-foot shoal about 130 yards off the southeast point of the bay. **Hayward Strait**, connecting East Channel with Sitka Sound, has a good channel through it, but the shores are fringed with rocks and reefs, especially at its south entrance, where they extend almost to midchannel from the western side and well off from the northeast side.

Currents.—The flood current enters Krestof Sound from Sitka Sound through Hayward Strait and from Salisbury Sound through Neva Strait and, when the water has risen high enough, through Sukoi Inlet. They meet somewhere in the sound. For daily predictions for places in the entrance to the sound from Hayward Strait, see the Tidal Current Tables.

Neva Point Reef extends about 75 yards southward from **Neva Point** on the east side of the southeast entrance to Neva Strait. It is marked by **Neva Point Reef Light (57°14.1′ N., 135°33.0′ W.)**, 17 feet above the water and shown from a small white house on a rock awash off the point.

Neva Strait between Baranof and **Partofshikof Islands**, together with Olga Strait, is the inside route between Salisbury and Sitka Sounds. The strait is narrow throughout and foul requiring careful piloting especially in **Whitestone Narrows.**

A Federal project provides for a channel dredged to a depth of 24 feet through ledge rock in Whitestone Narrows. In September 1959 the controlling depth was 24 feet. The channel is buoyed. Slightly greater depths can be found in the old natural channel between the dredged cut and Whitestone Point but this channel has sharp turns which are hard for a long vessel to make when the current is running.

In Neva Strait the flood current sets generally northward and the ebb current southward. The current velocity is 1.5 knots. For daily predictions, see the Tidal Current Tables.

Whitestone Cove, northeastward of **Whitestone Point** is a good anchorage with depths of from 5 to 7 fathoms.

The limits of the channel in Neva Strait are well marked with thick kelp which shows when the current is weak. At low water the limits are best defined by bare rocks and kelp. The dangers in the strait are charted and well marked by aids.

Columbine Rock, about 3 feet high and marked by a daybeacon, is close to the west shore about midway through the strait. A shoal, covered 2 feet, on the opposite side of the channel is marked by a lighted buoy. **Wyvill Reef,** covered at high water, and marked by a lighted buoy, is about midway between Columbine Rock and Highwater Island.

Highwater Island, wooded and prominent, is connected with the east shore at low water. Anchorage for small craft is found south of Highwater Island in 8 fathoms. A rock, with 3½ fathoms over it and marked by a lighted buoy, is midway between the northwest end of Highwater Island and the west shore. The main channel between the island and the buoy is only 125 yards wide.

Entrance Island, small and wooded, is close to **Zeal Point. Entrance Island Light (57°17.5′ N., 135°36.2′ W.),** 30 feet above water and shown from a small red house on the southwest point of the island, marks the northern entrance to Neva Strait.

St. John Baptist Bay is to the eastward of Entrance Island. The north shore is clear and bold for 1 mile, then is irregular with two small bights that are flats at low water. The south shore from Entrance Island to where the bay narrows is irregular with deep water close by the points. A timbered islet is 200 yards off the south shore 0.6 mile east of Entrance Island with rock ledges covered at high water extending to the next point. South of the islet the bight is clear, furnishing good anchorage for small craft in 7 fathoms. After passing this point, the south shore is clear except for flats from small streams.

Anchorages for moderate-sized vessels are near the center of the narrow part of the bay in 12 to 14 fathoms, and on the north side just west of the narrow part in 11 to 14 fathoms. This bay is open to the sea through Salisbury Sound, which gives prevailing northwest winds a clear sweep to the anchorages, and in southeast weather it is said to be subject to severe williwaws, which make the anchorages undesirable.

Gilmer Cove is on the southwest shore 1.2 miles northwestward of Entrance Island. It is 250 yards long by 75 yards wide, with a flat 150 yards wide at the head, and is a fit anchorage only for small craft in 7 fathoms.

Kane Islands are two low and wooded islands with several rocks and reefs close-to, except on the southeast side, where they extend 300 to 400 yards in a direction parallel to the channel. They are surrounded with kelp and there is good water close to their edge. The channel is good on either side of the islands, but the northeast side is always used because it is more direct.

Sukoi Inlet has its northern entrance about 0.8 mile westward of Kane Islands and affords good anchorage. At its head it connects at high water by a canoe passage with Krestof Sound. The inlet is comparatively clear until near its head but the shores are foul. Anchorage may be selected in any place desired, according to depths of water and swinging room required. The best anchorage is about 2.5 miles inside the entrance, opposite a small stream and flat on the west side, in 10 fathoms. Only small craft should go into the narrow part of the inlet beyond this point.

Scraggy Islands are 1.8 miles northwestward of Kane Islands and 0.5 mile from the west shore. The largest island is scantily wooded with two clumps of trees. Ledges with bare heads extend 0.4 mile southward from the island. The channel westward of the island is not recommended. The island is surrounded by ledges which bare to a distance of 100 to 200 yards.

Chart 8256.—The west coast of Kruzof Island trends northward and is indented by Shelikof and Gilmer Bays. Mount Edgecumbe occupies the southern third of Kruzof Island and is an unmistakable landmark for this part of the coast. There are no hidden outlying dangers until Cape Georgiana is reached. Sunken rocks do exist, however, in the bays and bights. The 100-fathom curve is 8 miles from shore abreast Cape Edgecumbe, 12 miles abreast Cape Georgiana, and the soundings decrease regularly to the coast.

The shore from Cape Edgecumbe to Neva Bay rises in a precipitous cliff of brown lava and forms a prominent landmark. Numerous large caves or blowholes are to be seen in this lava cliff. From Neva Bay to Beaver Point the shore is lower and rises in gradual wooded slopes. The shore between Cape Edgecumbe and Beaver Point is fringed with ledges extending 0.1 to 0.5 mile offshore, and shoal water, marked by thick kelp, extends from 0.2 to 0.5 mile offshore. The bottom slopes regularly out to beyond the 50-fathom curve and is uniformly rocky. There are no dangers more than 0.5 mile offshore.

Neva Bay, 2.5 miles northward of Cape Edgecumbe, is open to the sea and the entrance is choked with kelp; it is of no importance to navigation.

Beaver Point, 5.5 miles northward from Cape Edgecumbe, is low and wooded and forms the southern point to Shelikof Bay. A reef, marked by thick kelp and having numerous rocks which bare, extends for 0.8 mile northward of Beaver Point. The open bight close to eastward of the point is full of rocks and kelp.

Shelikof Bay, with depths ranging from 10 to 20 fathoms, is open westward, and is not recommended as an anchorage. Off Beaver Point and along the south shore kelp grows thick out to 6 and 10 fathoms. In the southeast corner there is a sand beach 1.5 miles long. The north side of Shelikof Bay is foul, numerous rocky islets and ledges extending 0.3 to 1 mile offshore.

Port Mary, at the head of Shelikof Bay, has general depths of 3 to 5 fathoms except at its northern end where it is shoaler. A large bare rock, about 20 feet high, lies off the southern entrance point. The only known danger in Port Mary is a rock, which bares at half tide, lying 300 yards off the eastern shore and 0.7 mile northeastward of the southern entrance point. Small craft can

find protected anchorage in southerly weather in the small bight, with a high rock in its center, on the southern side of the port.

Small vessels can find partially protected anchorage in the bight called **Cuvacan Cove**, located on the northern side of Shelikof Bay, about 1.6 miles eastward of Slaughter Island, and lying eastward of a group of islands and westward of a bold, wooded point. To enter the cove, pass southward and eastward of the group of islands and anchor in 3 to 4 fathoms, sand bottom.

Coleta Cove is on the northern side of Shelikof Bay, about 1.1 miles eastward of Slaughter Island. The cove affords protected anchorage for small craft and is much used by local fishermen. A large bare rock lies in the middle of the entrance, and the passage eastward of the rock is choked with rocks and kelp. A rock which bares at half tide lies in the middle of the western passage. To enter, pass very close to westward of the large bare rock and to eastward of the rock which bares at half tide.

Point Mary, the northern point at the entrance to Shelikof Bay, is high and wooded. **Slaughter Island**, lying off Point Mary, is grass-covered and connected with the shore at low water. Rocks which bare at various stages of the tide are off the south end of the island.

Point Amelia, 13.7 miles northward of Cape Edgecumbe, is the northwest point at the entrance to Gilmer Bay, and is the most prominent point between Cape Edgecumbe and Cape Georgiana. The point is the terminus of a peninsula. Two small knolls are at the seaward end; the inner one is wooded and the outer one a cone-shaped rock. Rocks bare at half tide are about 200 yards offshore. In the bight 2 miles northward of Point Amelia is a conspicuous sand beach 0.4 mile long.

Gilmer Bay is on the southeast side of Point Amelia. About 1 mile inside Point Amelia the bay contracts to 0.6 mile; it then expands to 1 mile, and terminates in a narrow arm.

The anchorage for large vessels is in midchannel, halfway up the narrow arm in about 15 fathoms, sticky bottom. In summer the swell does not come much beyond the entrance of the arm, but there is no record of the value of the anchorage in winter gales. The bight on the eastern side of the bay affords the best anchorage for craft up to 150 feet in length. An anchorage. eastward of the reef, has depths of 5 to 6 fathoms, hard bottom.

A sunken rock is on the east side in the approach to the bay, on line from Point Amelia to a white rocky islet about 58 feet high and close to the eastern shore. The rock is about 0.4 mile from the islet, has 2¾ fathoms over it, and shows a breaker at low water with a moderate swell.

Approaching from southward give the eastern shore a berth of over 0.8 mile to clear the sunken rock off Slaughter Island and the sunken rock described above. Otherwise there are no dangers and a midchannel course leads safely through the bay.

Sealion Islands are 3.5 miles northward of Point Amelia. They are five in number, the easternmost about 0.8 mile from shore. The two largest are grass-covered, the eastern one having a number of dead trees. The easternmost of the group is partially covered with grass; the remaining two are bare rocks.

Eagle Rock is about 1.6 miles northward of the westernmost Sealion Islands and 1.2 miles southward of Cape Georgiana. It is dome-shaped and bare.

Sealion Cove is a small cove about 2 miles southward of Cape Georgiana. A sand beach at the head is nearly 1 mile in length. A small peninsula forms its southern point.

13. SALISBURY SOUND AND PERIL STRAIT

Chart 8252.—Salisbury Sound and Peril Strait afford an inside passage from Chatham Strait to Sitka, via Neva and Olga Straits. Weekly scheduled mail and passenger vessels bound from Wrangell, Petersburg, Juneau, or Skagway to Sitka, pass through Peril Strait and Salisbury Sound and then proceed southward through Neva and Olga Straits. Under adverse conditions, when coming southward from Juneau or Skagway, they sometimes pass through Icy Strait and Cross Sound, then outside to Salisbury Sound before entering Neva Strait. Sergius Narrows in Peril Strait is a difficult passage to make under any conditions because of its narrowness and strong tidal currents and eddies. Passage through Sergius Narrows should only be attempted at slack water and preferably at high water slack, and with local knowledge, or with the aid of a pilot. There are no local pilots for Sergius Narrows but one may possibly be obtained at Juneau or Sitka.

Chart 8248.—Salisbury Sound has its entrance from the sea 200 miles northwestward of Dixon Entrance, and connects Peril Strait and Neva Strait with the Pacific Ocean between Cape Georgiana and Klokachef Island. About 1.8 miles from the eastern end, the channel is contracted to 1 mile by Goloi Islands on the north side and Sinitsin Island on the south. Vessels bound for Sitka from Cross Sound, Yakutat Bay, and the coast westward commonly enter through Salisbury Sound, as the distance is less than by way of Cape Edgecumbe and it puts them sooner into smooth water.

The shores of the sound are foul, especially the north side, which is studded with islands, rocks, and reefs with some kelp. It is open to the prevailing wind and sea, and there is generally a southwest swell rolling in and breaking along the northern shore, which sometimes reaches to Baranof Island. There are no dangers through the middle of the sound, but the depths are irregular and the bottom rocky; banks with depths of 6 to 20 fathoms having been found in the middle of the entrance.

The country back of the north shore is steep and rugged. The southern shore is more undulating, though quite high near the ocean, and is covered with trees from the top to the water's edge.

Approaching Salisbury Sound from seaward, especially from westward, it is sometimes difficult for a stranger to recognize the entrance until close-to. The bare, rugged mountains on the north side of the sound are prominent, and the sand beach at the head of Sealion Cove, 2 miles southward of Cape Georgiana, is at times useful in identifying the cape.

Currents.—The current from the sea sets eastward on the flood into Salisbury Sound, Peril Strait, and Neva Strait. The ebb current sets westward. The current velocity is 1.0 knot. For daily predictions for places in the sound, see the Tidal Current Tables.

The **wind** draws through Salisbury Sound, generally from sea. **Fog** sometimes banks into the sound very thick, but frequently disappears at the mouth of Fish Bay and Neva Strait.

Cape Georgiana is the southern point at the entrance to Salisbury Sound. About 0.7 mile eastward of the cape is a rounded hill, and 2 miles southeastward from the cape is **Mount Georgiana,** the first prominent peak which, from southward and westward, seems to rise gradually from the low point by a series of steps. This is a prominent landmark from southwestward for Salisbury Sound.

Sea Rock is an irregular, bare ledge, about 6 feet high, 0.5 mile northwestward of Cape Georgiana. **Morskoi Rock,** 0.6 mile westward of Sea Rock, has 1 fathom over it, not marked by kelp, and over which the sea usually breaks. The rock is marked on its northwest side by a buoy.

A deep channel is between these two rocks, and between Sea Rock and the cape, but neither is recommended. Strong tide rips are found around the cape and these two rocks when the wind is from northwest or northeast, while with southerly wind they are more prevalent around **Point Leo,** on the north side of the entrance to the sound.

Klokachef Island, on the north side at the entrance to Salisbury Sound, is of triangular shape. On its south side bare cliffs, 1,000 feet high, have the appearance of the northern half of an old crater, and are prominent from well out to sea to the southwestward. Bare reefs extend from the south and west sides of the island. At the east point are several bare rocks, and a reef which extends about 0.4 mile southward, and over which the sea generally breaks. From the northwest point of the island the **Fortuna Reefs** extend as a partially submerged reef for 600 yards northwestward to two bare rocks; and thence from these rocks for 0.5 mile westward as a sunken reef, showing some kelp, and on which the sea always breaks. **Klokachef Point,** the south point of Klokachef Island, is the north point at the entrance to Salisbury Sound, and is marked by **Klokachef Island Light (57°24.2′ N., 135°54.3′ W.),** 85 feet above the water and shown from a small white house.

Olga Rock, about 1.2 miles westward of Klokachef Point, on line with Klokachef Point and the north shore of Salisbury Sound, has ½ fathom over it and, except at high water and a very smooth sea, always shows a

breaker. Deep water is between Klokachef Island and the rock.

Kalinin Bay, on the south side of Salisbury Sound 2.5 miles inside the entrance, has anchorage near its head which is considerably used by fishing craft, but its entrance is obstructed by rocks and is narrow. Large craft should favor the southwestern shore in approaching the entrance in order to avoid a 3¼ fathom kelp-marked shoal off the entrance. Favor the western shore in entering until up to the first bend, then steer midchannel courses. A large rock, covered at high water and marked by a daybeacon, is about 100 yards off the eastern shore at the narrowest part of the channel, just before the bay widens to form the main anchorage.

A submerged rock with 1 fathom over it is 100 yards off the western shore and about 100 yards northwestward of the daybeacon. This rock is usually marked by a halibut float during summer months. Strangers should enter at half tide or low water, passing about 30 yards westward of the daybeacon. Well-protected anchorage in any weather can be found near the head of the bay in 4 to 5 fathoms, soft mud bottom. About 0.6 mile inside the bay on its eastern side, a fish buying scow is anchored. Fishermen supplies, including food, diesel oil, and gasoline are available here throughout the year. There is 250 feet of mooring float with sufficient depths for small craft. Fresh water can be had at the float during the summer months. A radio schedule is maintained during the summer months.

Sinitsin Island, low and wooded, is about 0.8 mile eastward of the entrance to Kalinin Bay, and is the farthest projection on the southerly side of Salisbury Sound. It should not be approached closer than 0.2 mile on its northern side and 0.5 mile on its western side. Deep water extends close up to the eastern side of the island. Small craft sometimes pass between the island and Kruzof Island, but strangers should use this passage with extreme care.

Sinitsin Cove, on the south side of Salisbury Sound 1 mile southeastward of Sinitsin Island, has deep water, an irregular, rocky bottom, and its shores are fringed with ledges. In bad weather the swell rolls heavily into this cove.

Goloi Islands, about 6 miles eastward of Klokachef Point and 0.5 mile off the northern shore, are two in number and bare; the northern one is divided at high water; the southern one has the appearance of a flattened cone. There are a number of other islands along and close to the north shore, but these and **Krugloi Islands,** 0.5 mile eastward, are the most prominent. These islands are surrounded by kelp rather close-to, and there is deep water close to the edge of the kelp on their south sides.

Round Island, 1 mile eastward of Goloi Islands, is wooded, and close to the north shore of Salisbury Sound at the entrance to Peril Strait.

Chart 8252.—Peril Strait is important as affording a frequently used passage from Salisbury Sound, and the waters southward to Chatham Strait. Its total length is about 41 miles. From Salisbury Sound it extends in a general northeasterly direction for 12 miles through Kakul Narrows, Sergius Narrows, and either Rose or Adams Channels to Povorotni Island; this part of the strait is narrow, has frequent changes in direction, and strong tidal currents, and strangers, other than small craft, are advised to take a pilot. From Povorotni Island the strait has a general northeasterly direction for about 4.5 miles to Otstoia Island, where it turns southeastward for 16 miles to Lindenberg Head, and then eastward for 7.5 miles to Chatham Strait. Some of the more serious dangers are marked by buoys or lights. A pilot may sometimes be obtained at Sitka or Juneau.

Fog from Salisbury Sound occasionally makes into Peril Strait as far as Sergius Narrows, and at times fills the strait northward of the narrows.

Currents.—The flood current from Salisbury Sound sets northward through Sergius Narrows and Adams Channel and meets the flood from Chatham Strait in the broad part of Peril Strait between Povorotni Island and Otstoia Island; the ebb current sets in the opposite direction. In Peril Strait the strongest currents are in Sergius Narrows, where the velocity is 5.9 knots on the flood and 5.5 knots on the ebb. For other places in the strait, the velocity of the current is between 1.5 and 2.0 knots. For daily predictions for places in Peril Strait, see the Tidal Current Tables.

Chart 8248.—Point Kakul, the southeastern point at the entrance to Peril Strait from Salisbury Sound, is bold and wooded. **Kakul Rock,** with 2 fathoms over it and marked by kelp, is 275 yards westward from the point. A buoy marks the west side of the rock.

Kakul Narrows form the entrance to Peril Strait from Salisbury Sound. The narrows are deep, the dangers are marked by aids, and they are easily navigated. The narrows have been found clear as shown on the chart.

Salmonberry Cove is a small bight on the western side of Kakul Narrows where small craft can find indifferent, and partially protected anchorage.

Brad Rock, with 1¼ fathoms over it and marked on its eastern side by a buoy, is 175 yards from the northwest side of Kakul Narrows, and about 0.2 mile westward of the outer Channel Rock. There are heavy tide swirls through this narrow part of the strait. The buoy tows under when currents are strong.

Channel Rocks extend 250 yards northward from the south point at the north end of Kakul Narrows. The largest rock is about 3 feet high and close-to; north of it are two rocks which cover only at the highest tides. **Kakul Narrows Light (57°22.5′ N., 135°40.9′ W.),** 27 feet above water, is shown from a small white house on a skeleton tower on a concrete pier. A rock which bares, is close northward of the light. There is thick kelp, close-to, north and east of these rocks.

Fish Bay has its entrance on the eastern shore southward of Sergius Narrows. Sand and gravel beaches show along the shores at low water, and at its head is a flat nearly 0.5 mile in extent. **Haley Rock** in the entrance, has ½ fathom over it and is surrounded by kelp. **Haley Anchorage,** 300 yards from the south shore and about 0.3

mile westward of Haley Point, has depths of 18 to 20 fathoms, sand bottom, and affords fair shelter in southerly weather. **Haley Point** is a sand flat terminating in a high-water island.

Schulze Cove, on the north side of Fish Bay, is the best and most convenient anchorage southward of Sergius Narrows for vessels awaiting slack water in the narrows. **Piper Island,** low and wooded, is in the entrance, the navigable channel, about 0.2 mile wide, lying between it and the western shore; the channel on the east side of the island should not be attempted. The cove is free of dangers if the shore be given a berth of over 100 yards. The anchorage is in the middle of the cove in 14 to 16 fathoms, soft bottom, with good protection. Small vessels can anchor at the head of the cove in 7 to 9 fathoms. The only danger in the approach is Haley Rock.

Suloia Bay has anchorage for small craft near its head in 12 to 15 fathoms, rocky bottom. The shores are foul near the anchorage, contracting it somewhat, and it is not recommended. Swirls make well into the bay. **Suloia Islet,** wooded, is in the bay 0.2 mile from the south side with rocks between. **Suloia Rock,** bare, is 400 yards northward of Suloia Islet.

Sergius Narrows is only 100 yards wide between the 3-fathom curves in **Sergius Channel** and has a controlling depth of 9 fathoms. It is advisable for a stranger to carry a pilot when using it. There are no local pilots for Sergius Narrows, though one may possibly be obtained at Sitka or Juneau. Vessels should pass through the narrows only at or near slack water, especially with the large tides, and preferably at high water slack. At the strength of the current it is not safe for any vessel bound either way, especially long ones, between Francis Rocks and Liesnoi Shoal. With the smallest tides those with local knowledge pass through at all stages of the current.

The daily predictions of the times of slack water and the times and velocities of the strengths of current for Sergius Narrows are given in the Tidal Current Tables. Mariners are advised to be on hand at least one-half hour before the predicted times of slack water in case abnormal conditions cause slack water to occur earlier than the stated times. If the current tables are not available, tide tables may be used. In Sergius Narrows the current turns north to south about 1¾ hours before the time of high water at Sitka and from south to north about 1¾ hours before the time of low water at Sitka. These are average times and do not take into consideration variations due to tidal inequalities as do the current tables predictions.

At the strength of the current the water is very much disturbed, heaving up over the West Francis Rock, Prolewy Rock, and Wayanda Ledge in the middle and boiling and swirling in the channel, especially at the end where the water is passing out. The channel is so narrow and the current so variable in direction that if a vessel gets a sheer she may be carried on the ledges or shore before she can be straightened out. With a strong north-flowing current a sharp deflection occurs at Shoal Point, which is dangerous, especially to long vessels bound southward, as it sheers the bow eastward in the direction of Wayanda Ledge, and there is little room to straighten out again on the proper channel line. With a strong south-flowing current a similar sharp deflection occurs westward of West Francis Rock, which is dangerous, especially to long vessels, bound either way, as it sheers the bow in toward the cove on the west side.

Vessels awaiting slack water at Sergius Narrows usually slow down before reaching it. If desiring to anchor, Schulze cove is convenient when south of the narrows; when north of the narrows, Bear Bay is convenient for small vessels. Deep Bay is a much better anchorage but its entrance is narrow.

Rapids Island is a small wooded island near the middle of Sergius Narrows. **East Francis Rock,** 350 yards westward of the southwest point of Rapids Island, has a least depth of 1¼ fathoms. **West Francis Rock,** with 1½ fathoms over it, is 400 yards westward of the west point of Rapids Island, and has depths of 5 to 6 fathoms close-to. It has leaf kelp, which shows only at slack water, and is marked by a lighted buoy northward of it. Vessels pass northwestward of the rock. In this vicinity the swirls and whirlpools are very strong while the current runs south.

Prolewy Rock, 0.1 mile northward of the middle of the north side of Rapids Island, is usually above water, but it is slightly covered at highest tides. **Wayanda Ledge,** within the 3-fathom curve, extends 0.1 mile northward of Prolewy Rock; its northwest edge marked by a buoy is 125 yards from the northwest shore of Sergius Narrows. The depth is ½ fathom over the ledge and it drops off quickly to the 3-fathom curve. The channel is between the buoy and the northern shore, and at its narrowest part is but 100 yards wide between the 3-fathom curves.

Sergius Narrows Light (57°24.5′ N., 135°37.8′ W.), 17 feet above the water, shown from a small white house on a skeleton tower, is on the north side of the narrows.

Liesnoi Shoal, nearly in midchannel 300 yards southward of Midway Rock, has a least depth of 1¼ fathoms and is marked by a lighted bell buoy close to the edge of the kelp between the shoal and **Mountain Head,** and 400 yards from the latter. **Midway Rock** is awash at highest tides.

Bear Bay, on the southeast shore, has anchorage for small vessels only, but is convenient if awaiting slack water in Sergius Narrows. Enter in midchannel and anchor with **Arthur Island** in line with the southwest side of **Bear Bay Island,** bearing northward, in 14 to 16 fathoms, soft bottom. Vessels should not go above the range given to avoid swinging onto the ledge on the southern side of the bay.

Deep Bay, on the northwestern side of the strait between Big and Little Islands, is a good anchorage, and the most convenient for large vessels northward of Sergius Narrows while awaiting slack water in the narrows. **Grasstop Rock,** about 5 feet high, is midway between Big and Little Islands, and is marked by a daybeacon; the best passage into the bay is between the rock and Big Island.

To enter, keep the south side of Big Island aboard at a distance of 100 yards in passing Grasstop Rock; then follow a midchannel course into the bay and anchor 0.2

to 0.8 mile beyond the wooded islet on the north side, westward of Big Island in 10 to 12 fathoms, soft bottom. A bare rock about 10 feet high, is 100 yards southeast of Big Island, and kelp marked rocks extend 100 yards southeastward of the rock.

Middle Point Rock, marked by a light, is 300 yards westward of **Middle Point** with a narrow channel between. The rock is covered at half tide. A ledge with 2¼ fathoms over it lies 350 yards from Arthur Island toward Middle Point.

Yellow Point is about 0.6 mile northward of Middle Point. A rock, bare at half tide and marked by a daybeacon, is 150 yards offshore, 0.3 mile eastward of Yellow Point.

Wooded **Big Rose Island** and **Little Rose Island** are in midchannel 3 miles southward from Pogibshi Point. **Adams Channel** is the passage eastward of them; **Rose Channel** is the passage westward.

Rose Island Rock, bare, and marked by a light is off a bight on the east side of Big Rose Island, about 200 yards from the island.

Rose Channel Rock, marked by a daybeacon, is 250 yards northwestward of Little Rose Island and 400 yards from the west shore. It is awash at highest tides and is a danger only when using Rose Channel.

Povorotni Island, low and wooded, is 500 yards northward of Pogibshi Point and is marked by a light on the northwest end of the island. The island shows against a wooded highland in coming from northward and is not readily seen until fairly close-to. A bare ledge is between the island and Pogibshi Point; the narrow passage between this ledge and the point is suitable only for small craft.

Poison Cove has its entrance on the west side westward of Povorotni Island, and affords anchorage for small craft only. Anchor in the middle, about 300 yards inside the south point of the entrance in 18 fathoms, soft bottom, taking care to avoid the flat at the head.

From Pogibshi Point the shoreline trends in a northeasterly direction for about 5.5 miles to Nismeni Point, about 1 mile beyond Otstoia Island. **Deadman Reach** is the stretch of water off the flat between Otstoia Island and Pogibshi Point, about 2.2 miles from the latter. Anchorage may be made in several places along the shore.

Pogibshi Anchorage, in 22 fathoms, sandy bottom, is in Goose Cove on the northeastern side of Pogibshi Point off the entrance to a small lagoon. **Favorite Anchorage**, in 17 fathoms, is about 1.2 miles southward of Otstoia Island and 0.2 mile from shore. Anchorage may also be made 0.4 mile southwestward of Otstoia Island.

Emmons Island, is about 5 miles northward of Povorotni Island. The channel between Emmons and Chichagof Islands should be used with caution and at low water. The buildings and radio tower of a Federal Aviation Agency Station on Rodgers Point are conspicuous. A float is in the bight south of the point.

Ushk Bay has its entrance on the west side about 2.5 miles southwestward of Emmons Island. A midchannel course will carry safely to a secure anchorage near the head of the bay, in 18 to 20 fathoms, soft bottom.

Hoggatt Reefs are about 2.7 miles northeastward of Povorotni Island and 1.2 miles from the eastern shore. The largest and highest part of the reef at the eastern end is **Hoggatt Island**, a sand islet covered only at highest tides. Ledges, covered at about half tide, are westward of the island; and rocks, covered at ordinary high water, are southward of it.

Dolph Rock, which bares, is about 0.8 mile off the west shore at the entrance to Ushk Bay and 1.2 miles westward of Hoggatt Island.

Ford Rock, which bares only at lowest tides, is about 0.9 mile northward of Hoggatt Island, and 1.5 miles westward of Krugloi Islet, nearly in line between it and the northern point at the entrance to Ushk Bay.

Otstoia Island, low and wooded, with dead trees standing at its northeast end, is 4.5 miles northeast of Povorotni Island. **Otstoia Island Light (57°33.7′ N., 135°26.9′ W.)**, 17 feet above the water, shown from a white wooden house, is at the southern end of the island.

Elovoi Islet, small and wooded, and **Krugloi Islet**, small with a clump of trees in the middle, lie close together about 0.6 mile westward of Otstoia Island.

Charts 8248, 8283.—A flat extends about 300 yards off the **Duffield Peninsula** shore constricting the channel between it and Otstoia Island to a clear width of about 150 yards. A lighted buoy marks the edge of the flat. The channel has a depth of 9 fathoms.

Cozian Reef, with ¾ to 1 fathom over it, extends 0.5 mile northeastward of the northeast end of Otstoia Island. Its eastern extremity is marked by a lighted buoy.

Nismeni Point is low and wooded and lies about 1.1 miles eastward of Otstoia Island. A sunken rock lies 200 yards from the shore and 0.5 mile westward of Nismeni Point. A reef extends 0.5 mile eastward of the point.

Chart 8252.—Hoonah Sound is the prolongation of Peril Strait northwestward of Emmons Island. **Vixen Islets**, a group of small islets, lie about 0.5 mile to the northwestward of Emmons Island. **Moser Island**, about 2.5 miles northwestward of Emmons Island divides Hoonah Sound into two arms, connected at high water at the northwest end of Moser Island.

North Arm is comparatively clear until 2 miles from its head, where there is a bare rock in midchannel southeastward of the eastern end of an island on the northern side, with no safe channel between. A flat extends 0.5 mile from the head. Anchorage can be made near the head of the northern arm above the island in 22 to 25 fathoms.

South Arm is comparatively clear, but the south side should not be approached too closely. On the south side, 1 mile within its entrance, is a small arm, **Fick Cove**, the head and western shore of which are shoal; a wooded islet is just east of the cove. Anchorage can be made in the entrance in 20 to 22 fathoms. Two miles farther westward the southern arm divides; the northern branch connects at high water with the North Arm, and a flat extends 0.8 mile from its head; in the middle, about 1.8 miles within the entrance, is a rock which bares.

Anchorage can be made 300 to 500 yards above the rock in 13 to 16 fathoms. The southern branch, **Patterson Bay,** has shoals fringing its northwestern side, and a flat at its head. Anchorage can be selected near its head in 24 fathoms.

Chart 8283.—Broad Island, 200 feet high and wooded, is 2.1 miles northeastward of Otstoia Island and 0.5 mile off the north shore at the entrance to Hoonah Sound.

On the north shore of Peril Strait, 2.5 miles east of Broad Island, a large landslide extends up the mountain side for several hundred feet.

Nismeni Cove, on the eastern side of Nismeni Point, affords anchorage for small craft, with protection from southerly winds. To enter, keep the south shore aboard at a distance of about 200 yards to avoid the reef off Nismeni Point, and anchor in the middle of the cove about 0.3 mile from the head, in 6 fathoms, fair holding ground.

Peschani Point is a low grassy point on the south side 2 miles northwestward of Rodman Bay.

Rodman Bay, on the south side 6 miles southeastward of Nismeni Point, has a good anchorage at its head. The soundings in the entrance are very irregular, and the shores at the entrance should be given a berth of 0.7 mile. **Rodman Rock,** with 1 fathom over it, and marked by a buoy, is in the bay about 0.5 mile northwestward of the eastern point at the entrance. Vessels should pass westward and northward of the buoy.

Point Benham and **Point Elizabeth,** rounded wooded points, are, respectively, eastward and westward of the entrance to Rodman Bay.

Lauf Islands are on the east side near the head of Rodman Bay. The anchorage is 0.2 to 0.3 mile southwestward of Lauf Islands in 14 to 15 fathoms, soft bottom. Flats extend 0.5 mile from the mouths of streams which enter the southeast and southwest corners of the head of the bay. Southeast winds blow with considerable force through the pass at the head of the bay. A midchannel course leads safely to the anchorage. **Appleton Cove,** on the east side 1.5 miles within the entrance, has numerous rocks and shoals, and affords anchorage for small craft only.

False Island, small and wooded, is close to the northeast shore of Peril Strait, opposite the entrance to Rodman Bay.

Saook Bay has its entrance on the south side of Peril Strait, 4 miles southeastward of Rodman Bay. **Paradise Flats** extend about 0.8 mile from its head. The bay affords a good and convenient anchorage with shelter from all winds. Water can be obtained from small streams.

Saook Point and **Point Kennedy** are the north and south points of the entrance to Saook Bay. A depth of 7½ fathoms has been found about 0.4 mile offshore about 0.5 mile eastward of Point Kennedy; lesser depths may exist.

To enter, take a midchannel course until the second group of small islets on the southeast side is abeam, then keep the southeast shore aboard at a distance of 150 yards to avoid a sand and gravel flat which extends to midchannel from a small stream coming from a ravine in the western shore. The anchorage is in midchannel 0.6 mile southward of this ravine, in 18 fathoms, mud bottom.

False Lindenberg Head, with rocky cliffs and wooded on top, is on the northern side of the strait, 2.5 miles northeastward of the entrance to Saook Bay.

Todd, on the eastern side of the bight in the northern shore of Peril Strait, about midway between False Lindenberg Head and Lindenberg Head, has an inactive cannery and a general store. The cannery wharf is 300 feet in length and has a face of 70 feet with a least depth alongside of about 25 feet. Mail and passenger planes stop here on call.

A rock, covered 2¼ fathoms is about 200 yards off the cannery wharf. A sandspit makes out from the eastern shore southeastward from the wharf. The tidal current is reported to set away from the wharf during the first 1½ hours of flood, and to set on the wharf during the remainder of the tide.

Lindenberg Head is a wooded knoll on a point projecting from the northeastern shore 2.2 miles eastward of False Lindenberg Head.

Lindenberg Harbor is a small cove on the west side of Lindenberg Head and affords protection from northward and eastward. The anchorage is in the middle of the cove in 12 to 15 fathoms, with indifferent holding ground.

McClellan Rock, about 200 yards off Lindenberg Head, with no safe passage between, covers at highest tides. It is marked by **McClellan Rock Light (57°27.2′ N., 135°-01.5′ W.),** 22 feet above water, shown from a small white house on a cylindrical pier.

Hanus Bay is a broad open bight in the south shore southward of Lindenberg Head. At its southeast corner Hanus Bay connects at high water with Portage Arm in Kelp Bay. At the western end of the bay are two coves, the southern one nearly bares; the northern one has anchorage for small craft. Ledges which bare are about 250 yards off the points of this cove. Hanus Bay is not recommended for large vessels on account of its irregular bottom and exposed situation. A temporary anchorage might be made in its entrance. Small craft frequently anchor in the cove at the southeastern side of the bay in 3 fathoms, mud bottom. The anchorage is approached through the entrance eastward of **Dead Tree Island.** It offers no shelter during southeast weather as strong winds draw through Portage Arm and are known to have blown small vessels out of the bay.

Eva Islands, close to the southern shore and about 1.6 miles eastward of **Point Hanus,** have broken ground on all sides. A sunken rock is 600 yards northeastward of the small rocky islets northwestward of Eva Islands. **Svensen Rock,** sunken and sparsely marked by kelp, is 0.5 mile westward of the same islets.

Fairway Island, wooded, and marked by a light on its northeast end, is 2 miles northwestward of Point Thatcher. A rock, with 1 fathom over it and marked by kelp, is 0.8 mile westward of Fairway Island. Ledges, mostly bare at half tide, extend 600 yards eastward of the island. Southward of Fairway Island the bottom is very irreg-

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ular, and there are numerous rocks and reefs, some of which show only at extreme low water, while the sunken rocks are but poorly indicated by kelp.

Midway Reef is about 0.4 mile long in a northerly direction. Its north end uncovers 5 feet and is about 0.8 mile eastward of Fairway Island.

Traders Islands, low and wooded, are 0.5 mile southward of Fairway Island. **Thatcher Channel** is the narrow channel southward of Traders Islands.

Point Thatcher, the southern point at the eastern entrance to Peril Strait, is low and wooded, and terminates in a ledge 250 yards long, with three bare heads. A rock with 2¾ fathoms over it is 0.6 mile 20° from Point Thatcher.

Point Craven, the south point at the entrance to Sitkoh Bay, is 1.4 miles northward from Fairway Island. **Point Craven Light (57°27.8′ N., 134°51.8′ W.),** 35 feet above the water, is shown from a small white house on the outer of two rocky islets off the point.

Point Hayes, the northern point at the entrance from Chatham Strait, is moderately high, but is low at the extremity. Two wooded islets, about 60 feet high, and a bare rock are close to the point.

Morris Reef is a dangerous group of ledges and sunken rocks surrounding Point Hayes to a distance of nearly 1 mile on its east and southeast sides, and extending southwestward of the point halfway across the entrance of Sitkoh Bay. The southeast extension of the reef is broken ground with kelp and depths of 4 to 7 fathoms, possibly less, which extend 0.5 mile farther, and is marked at its southeast end by a lighted bell buoy 1.5 miles southeastward of Point Hayes. On a line between the buoy and Peninsular Point, 1.5 miles northward of Point Hayes, is an extensive reef, marked by kelp, which partly bares.

Sitkoh Bay has its entrance between Point Craven and Point Hayes. The bay is deep throughout in midchannel, but there are several flats at the mouths of streams, and an extensive one, 1 mile wide, at its head.

Chatham (P.O.) on the southwest side of Sitkoh Bay, 2 miles inside the entrance to the narrow part of the bay, has a cannery. The cannery wharf has a face of 200 feet with depths of 30 feet and more alongside. Off its eastern end is a rock which is sometimes marked by a barrel buoy. The oil wharf, westward of the cannery wharf, has about 20 feet at its end. The cannery operates a radio station, machine shop, and a general store during the season. Fresh water can be obtained at the cannery wharf and gasoline, diesel oil, and lubricating oil at the oil wharf. A scheduled air mail and passenger service is maintained. Vessels usually make a port landing at the wharf. Refer to chapter 3 for information about marine railways in Alaska.

Anchorage can be made 0.2 to 0.4 mile from the head of the bight on the northern shore 2 miles from Point Hayes, in 15 to 20 fathoms, rocky bottom, sheltered except from southeast winds. Secure anchorage can be had near the flat at the head of the bay about 1.4 miles above the cannery in 17 to 22 fathoms, soft bottom.

Entering Sitkoh Bay, keep the Point Craven shore aboard distant about 0.3 mile to clear Morris Reef, and then keep in midchannel. The chart is the guide.

14. WEST COAST OF CHICHAGOF AND YAKOBI ISLANDS

Chart 8002.—The west coast of Chichagof Island has a general northwesterly direction for about 37 miles from the west end of Klokachef Island to Cape Cross, and then the coast trends northward for 10 miles to Yakobi Rock. The main shore is formed by **Chichagof Island,** which has numerous mountain peaks. From Klokachef Island to Khaz Bay the 100-fathom curve is about 15 miles offshore. The 50-fathom curve is about 6 miles offshore, and inside of that distance the soundings are irregular and less than 50 fathoms, except a narrow pocket with depths of 50 to 87 fathoms, which extend 5.5 miles 219° from Khaz Bay entrance. From the entrance of Khaz Bay to Cape Edward the coast is formed by numerous islets, rocks, and breakers, which prevent a near approach to the shore.

An inside passage for small vessels extends along the greater part of this coast. From Salisbury Sound this route leads northward through Fortuna Strait and then outside to Khaz Bay. Small craft sometimes enter Slocum Arm through Piehle Passage which lies close westward of Khaz Head. From Khaz Bay the route leads through Ogden Passage and Surveyor Passage to Portlock Harbor, thence through Imperial Passage to the outside coast. Small craft can take the shorter route from Khaz Bay, passing through Ogden Passage and Kukkan Passage and Bay. Small craft with local knowledge can leave Portlock Harbor by Dry Pass. From Portlock Harbor to Lisianski Strait the route leads outside, thence through Lisianski Strait and Inlet to Cross Sound.

This entire coast has been surveyed and is shown on a series of large-scale charts; all known dangers are charted.

Chart 8248.—Fortuna Strait separates Klokachef Island from Chichagof Island. The southeastern entrance is between ledges extending westward from Chichagof Island and **Vincent Reef,** extending southward from the east end of Klokachef Island. A shoal marked by kelp, with a least depth of 2¼ fathoms, is 0.5 mile northward from the eastern end of Klokachef Island. A rock, with ½ fathom over it and marked by kelp, is 350 yards from the north shore on the west side at the entrance to Leo Anchorage.

Fortuna Strait is used, especially by small craft, when bound to Khaz Bay from Salisbury Sound.

Leo Anchorage, on the northeastern side of Fortuna Strait, narrows to the head, where there is a stream and small flat. The anchorage affords a fair shelter from northerly winds, but it is not recommended in southerly weather. With southerly winds there is less swell near the west side. The anchorage is near the middle, in 15 to 20 fathoms, or for small craft near the head in 5 to 7 fathoms. The bottom is hard with sticky patches.

Point Slocum is about 3.5 miles north-northwestward of Klokachef Island. A bare, flat rock, about 30 feet high, is 200 yards southward of the point; inside the rock a boat landing can be made in ordinary weather. A breaker is about 0.5 mile westward of Point Slocum. An isolated breaker is about 0.6 mile southward from this point.

Chart 8280.—Khaz Head, a bold, bluff headland, particularly noticeable from southwestward, is about 7 miles northward of Klokachef Island. It is the northwestern end of **Khaz Peninsula,** a rugged peninsula between Slocum Arm of Khaz Bay and the sea.

Khaz Point, the southwestern point of Khaz Head, shows from the southeast as a conical hill. It is about 2.8 miles northwestward of Point Slocum. The shore between these points forms a shallow bight in which there is much foul ground as well as numerous breakers. Breakers extend 0.8 mile westward of Khaz Point. A rock, awash at high water, at the end of the reef extending southward from the point, is used as a landmark by local motor boats which keep close inshore. The surf shows on this rock at all times.

Piehle Passage is entered close-to, westward of Khaz Point, and leads among the rocks and islets westward of Khaz Head to Slocum Arm. This passage is extensively used by small craft with local knowledge, but is difficult for strangers. The entrance at Khaz Point is closed by breakers in heavy weather. Good protected anchorage for small craft can be had in the bight on the northwestern end of Khaz Head on the southeastern side of Piehle Passage. Anchorage can be selected at the head of the bight in 8 to 10 fathoms, mud and gravel bottom.

From Khaz Head a chain of numerous islands, rocks, and reefs, some wooded and all generally low, extend 3.5 miles northward to Ramp and Deuce Islands, at the entrance of Khaz Bay.

Middle Breaker is on a bare rock about 2 miles northwestward of Khaz Point and nearly 1 mile from the nearest islet to eastward.

Khaz Breakers, marked by a lighted whistle buoy off the western side, are the outer dangers in approaching Khaz Bay from southward, and are on a reef about 1.4 miles westward of Middle Breaker.

Outer Rocks are the southernmost bare rocks on the west side of the entrance to Khaz Bay. They are two in number, about 200 yards apart. Outer Rocks are distinctly darker than the rocks to northward, are mound-

like in appearance, and can easily be identified by strangers.

Black Islet is the highest one of a group of small islets about 3.2 miles northwestward of Outer Rocks. It is the only wooded islet of the group and forms an easily distinguishable landmark. Two bare rocks are about 0.8 mile westward of Black Islet. A group of bare islets and rocks extend 0.8 mile southward of Black Islet. Breakers extend 2 miles westward of the islet.

White Sisters are two outlying large white rock islets, about 2.5 miles northwestward of Black Islet.

Inside the lines joining Outer Rocks, Black Islet, White Sisters, and Cape Edward are numerous bare rocks and reefs, but the four mentioned are the most prominent and easily recognized.

Khaz Bay, about 11 miles northwestward of Klokachef Island, is 2.2 miles wide at its entrance between Ramp Island and Outer Rocks, and extends northward 2 miles to Quit Point. Here it divides into an extensive system of inland passages extending eastward, northward, and westward, and which connects with the sea northwestward of Cape Edward through Kukkan Bay and Portlock Harbor.

The entrance, marked by a lighted whistle buoy off Khaz Breakers, is wide and has deep water but is difficult to recognize on account of the many islets and bare rocks. In the entrance are a number of breakers which show except at high water with an exceptionally smooth sea, and assist in daylight and clear weather in shaping the course. Once in the entrance vessels should have no difficulty in going into Slocum Arm or through Ogden Passage to Kimshan Cove. Klag Bay is difficult except for small vessels at slack water.

Black Rock, about 1.1 miles northeastward of Outer Rocks, covers at high water and is generally marked by a heavy breaker.

Ramp Island, small, about 100 feet high, and scantily wooded, is the westernmost of the islands on the eastern side of Khaz Bay.

Deuce Island is the northwesternmost wooded island on the eastern side of Khaz Bay, and lies about 0.8 mile northward of Ramp Island. At its northwestern end is a round bald knob. **Ninefoot Shoal,** about 0.5 mile northward of Deuce Island, is marked by a buoy.

Quit Point is the south end of the southernmost of the low wooded islands on the north side in the entrance to Khaz Bay, and lies about 1.2 miles northwestward of Deuce Island. The end of the point is bare, and at the timber line is about 90 feet high. This island is somewhat higher than others near it, and from most points shows as two knobs, the southern one the larger and higher, with a saddle between. A bare, rocky islet lies about 0.3 mile westward of Quit Point, and there is foul ground, generally marked by breakers, between this islet, Quit Point, and **Gray Rock** about 0.4 mile southwestward of the point.

Rough Channel, lying westward of Quit Island and Gray Rock, is an entrance to Ogden Passage from Khaz Bay. At its north end there are rocks above and under water which contract it to about 200 yards. There is generally a heavy swell in the channel, and it should be avoided except possibly at low water with a smooth sea. Smooth Channel is the better entrance to Ogden Passage.

Guide Rock, bare and 15 feet high, is about 0.4 mile eastward of Quit Point, and is the easternmost of the bare rocks extending 0.2 mile eastward from the island. It is an important mark for entering any of the arms.

Smooth Channel, the best entrance to Ogden Passage, is protected from the ocean swell by a chain of wooded islands and ledges. From north of Guide Rock it extends in a northwesterly direction, with depths of 7 to 15 fathoms. Smooth Channel also forms the approach to Klag Bay and connecting bodies of water. South of **Vorota Island** is an excellent anchorage for vessels up to 250 feet in length in 20 to 25 fathoms. With heavy southwesterly swells some of the turbulence enters the anchorage but not enough to make it unsafe.

Doolth Mountain, 6 miles northward of the entrance to Khaz Bay is wooded. It stands out from the higher mountains farther inland and is the most prominent one near the coast.

Slocum Arm extends southeastward from Khaz Bay. Its southwest side is formed by the mountainous Khaz Peninsula terminating westward at Khaz Head, and by the chain of wooded islands extending 3.5 miles northwestward from that head to Deuce Island. The arm is free from dangers, with the exception of a rock, bare at half tide, 300 yards from the northeastern shore.

Ford Arm, northeastward of Khaz Head, extending northeastward from Slocum Arm, is constricted in places by islands and rocks. At its head is an expansion about 0.8 mile in diameter, from which arms extend southeastward and northwestward. The southeastern arm has some islets and a flat at its head; there is anchorage for vessels northwestward of the islets in desired depths up to 15 fathoms. The northwestern arm has anchorage for small craft at its head in 6 to 15 fathoms. Small craft can also anchor in **Elf Cove,** the cove north of the north point at the entrance to the northwestern arm, in 5 to 8 fathoms; a ledge bare at half tide is close to the north side of the cove.

The entrance to Ford Arm is marked on the southeast side by a group of small wooded islands, which should not be approached closely. Two miles inside the entrance on the southeastern shore is a projecting point.

Falcon Arm, 1.2 miles southeastward of Ford Arm, extends northeastward and narrows to 350 yards at its head. A rock with 1 foot over it is 0.4 mile inside the bay in the middle. Favor the western shore for 0.5 mile from the entrance to avoid this rock and then keep in midchannel. The depths in the wide part of the arm are 22 to 25 fathoms. A good anchorage is in an expansion above a point on the western side 1.5 miles from the entrance in 13 to 15 fathoms.

Waterfall Cove, about 1.8 miles southeastward of Falcon Arm, is identified by a large waterfall about 1 mile

above its head. Two bights are at the head; the eastern one dries; the western one has 4 to 8 fathoms and affords anchorage for small craft.

Island Cove, about 4.5 miles southeastward of Falcon Arm, has some islands in it near the shore. The anchorage is in the eastern end of the cove in about 16 fathoms. Favor the eastern point of the cove when entering and avoid a flat which extends 300 yards from the north shore of the anchorage.

On the south shore of Slocum Arm, opposite Island Cove, is a small point with a wooded knoll 80 feet high. Anchorage for small craft is in the cove westward of this point in 6 to 10 fathoms.

Flat Cove, on the north side 6 miles southeastward of Falcon Arm, has depths of 25 to 30 fathoms to the flat which extends 700 yards from its head.

Good anchorage is 0.5 to 0.6 mile from the head of Slocum Arm in 16 to 18 fathoms. A flat extends nearly 0.3 mile from its head.

Klag Bay, at the head of Khaz Bay, is cluttered with islands and the shores are foul especially on the east side behind the islands in the bay. The two entrances to the bay lead through narrow crooked channels, with foul shores and strong currents, which are difficult except for small vessels at slack water. Strangers should enter at low water slack when the dangers will show above water or be indicated by kelp. **Chichagof** is an abandoned mining camp on the west side near the head of the bay, where there is a float for small craft.

The main entrance is through **The Gate,** which has its entrance 1 mile northward of Guide Rock. It has a depth of 4½ fathoms and a width of 50 yards at its narrowest part, between a daybeacon on the east side of Vorota Island and a rocky 1-fathom shoal 20 yards off a sparsely-wooded islet on the east side of the entrance. An unlighted range marking the centerline of the channel clears the 1-fathom shoal.

The western entrance through Elbow Passage is marked by **Elbow Passage Light (57°37.1′ N., 136°07.5′ W.),** 14 feet above the water and shown from a small white house on the south side of the entrance. The western part of Elbow Passage has a midchannel depth of 2¾ fathoms and is constricted in places to a width of 75 yards by kelp-marked shoals.

The two entrance channels merge northward of The Gate and the channel then continues through Elbow Passage around the south and east sides of **Klag Island.** The pass west of Klag Island is nearly blocked at the north end and is suitable only for small boats and launches. Northward of Klag Island the bay is comparatively clear though there are a number of islands in it.

Anchorage can be found in the bay above Klag Island in depths of from 3 to 20 fathoms and off the wharf at Chichagof.

Currents.—It is reported that the currents in Elbow Passage, south of Klag Island, are strong and the passage is navigable only near the time of slack water.

Caution.—The last of the ebb sets out of Elbow Passage westward with great velocity through the western entrance, forming heavy swirls, and passage should be attempted only at slack water, preferably low-water slack.

Ice forms in Klag Bay early in January and is a hazard to navigation through February and most of March.

Lake Anna has its entrance through a narrow channel from the east side of the northern end of Elbow Passage. There is anchorage at the south end of the lake in 6 to 15 fathoms. At 1 mile northward of the entrance a ledge with bare heads extends to midchannel from the east side; the channel is westward of it. At the north end of the lake is an anchorage in 5 to 12 fathoms. Lake Anna should only be entered by those with local knowledge because of its narrow entrance and extreme currents except at slack water.

Sister Lake is joined to the northeast end of Lake Anna by a narrow, foul passage 0.5 mile long, navigable only for small boats at slack water. The south end of this lake is only 200 yards from Ford Arm and at the same distance from **Double Cove,** a small bay at the north end of Khaz Bay, with low land between. The lake is reported to be deep, with good anchorage in the coves. The lake should be navigated with caution. The power plant of the Chichagof Mine is here.

Khaz Bay is connected with Portlock Harbor by Ogden and Surveyor Passage, and is a navigable route for small vessels. Another route, partially protected, leads from Ogden Passage through Kukkan Passage and Bay to South Passage, which is the southern entrance to Portlock Harbor. This route is recommended for small craft only. Rough Channel and Smooth Channel have been described previously in this chapter.

Ogden Passage is entered from Khaz Bay through Rough Channel or Smooth Channel, the latter being the best. From Klag Bay it can be entered through the western part of Elbow Passage. The depths in Ogden Passage are generally good and the dangers are charted, but several narrow passages and sharp turns make its navigation difficult for large vessels. The bottom is generally rocky and the only good anchorage is in Kimshan Cove.

Frog Rock is a steep, grassy rock about 35 feet high, and is the outermost of a small group of islets in the east side of the passage. A deserted village is 0.5 mile southeastward of it.

Snipe Rock, about 0.6 mile southwestward of Frog Rock, is a flat, grassy rock about 10 feet high and is part of a long sunken ledge. It is marked by a daybeacon and lies in the entrance to Kukkan Passage which leads through Kukkan Bay to the sea, northward of Cape Edward.

Fitz, Dippy, and **Port Islands** are wooded islets which lie at the junction of Ogden Passage with Surveyor Passage. A daybeacon marks the northwestern side of a reef with ½ fathom over it, which lies in the channel leading to Kimshan Cove between Fitz and Dippy Islands. Boats passing between the daybeacon and Fitz Island should

give the daybeacon a berth of at least 75 yards to avoid the reef. A sunken rock is in the middle of the channel westward of Port Island making it unsafe.

Kimshan Cove, eastward of Fitz Island, has depths of 6 to 11 fathoms. Anchorage can be selected anywhere in the cove; the bottom is mud. The abandoned buildings and wharf of the Hirst Chichagof Mine are on the southeastern side of the cove. Along the face of the wharf is a depth of 9 feet with 3 fathoms about 10 feet off the wharf. There is only a watchman at the wharf and the wharf is in poor condition.

Chart 8258.—Surveyor Passage is the passage extending from Portlock Harbor to Ogden Passage west of Kimshan Cove. Many sunken rocks are in the passage. A daybeacon marks a reef, which uncovers about 7 feet, on the eastern side of the passage 0.5 mile southward of Lydonia Island. A sunken rock is 50 yards off the northern shore in the narrow part of the passage about 0.5 mile southeastward of the daybeacon. **Lydonia Island** is a wooded island in the northern end of Surveyor Passage. The channel westward and southward of the island is foul, and large vessels always use the eastern channel.

Minnie Reef is in the main channel northward of Lydonia Island. The reef, which uncovers about 5 feet, is marked at the northeast edge by **Minnie Reef Light (57° 43.7′ N., 136°10.2′ W.)**, 21 feet above the water and shown from a white square daymark on a mast. The area between the reef and Lydonia Island is very foul.

Black Bay, extending for 1 mile eastward from Surveyor Passage, has two islands obstructing its entrance. The best passage into the bay is between Point Lydonia and the northernmost of these islands, although small boats can pass between them. The shoreline is steep and rocky except at the head where there is a large sand and gravel flat. Strong winds draw through the bay from the head and it is not recommended for shelter.

The **tidal currents** in Surveyor Passage are small. The flood enters the passage from both ends and meets in the vicinity of the entrance to Black Bay.

Chart 8280.—Kukkan Bay is between Edward Islands and Herbert Graves Island. It is poorly protected and is used only as a passage into Ogden Passage through Kukkan Passage. The principal entrance is northward of Edward Islands, but vessels can also enter southward of these islands. Kukkan Bay is connected with Ogden Passage by **Kukkan Passage** and is used by cannery tenders of about 9-foot draft at all stages of the tide, however, the spot shown as 2 fathoms, on the north end of the shoal area off Pole Point, breaks in heavy weather and may have less than 2 fathoms on it. It should be avoided by all vessels. **Pole Point**, on the southern side of the bay, is a bare, bluff point with high, wooded land behind it. **Ittar Rock** is a bare rock 12 feet high in the middle of the entrance to Kukkan Passage.

Tawak Passage extends southward from the western end of Kukkan Passage, and affords a protected, although intricate, passage for small boats along the coast. The northern end of the passage is foul and should not be used without local knowledge. The islands westward of Tawak Passage are called the **Myriad Islands**. **Gig Pass** is a deep, narrow passage leading from the southern end of Tawak Passage to Ogden Passage.

Edward Islands are two groups of prominent, wooded islands about 0.8 mile southward of Cape Edward. Foul ground extends for over 0.5 mile westward of these islands. A brown, bare rock, 16 feet high, is 1 mile south-southwestward from Edward Islands.

Cape Edward, on the western point of **Elkugu Island**, is about 3 miles northward of White Sisters. A rock, bare at high tide, is about 0.5 mile westward of the cape and there are sunken rocks 200 yards northwestward and 50 yards eastward of this rock. **Elkugu Bay**, the eastern side of Cape Edward, is exposed to southward and is of no importance.

Chart 8258.—Portlock Harbor is formed on its seaward side by Hogan and Hill Islands. **Hogan Island** is nearly flat-topped and timbered with scrubby growth. The shoreline is very steep and rocky, with practically no sand beach except for small coves, which are unfit for beaching any size boat. **Hill Island** is well-timbered except in the northwestern portion, which is almost a flat plateau sparsely wooded with scrub spruce. The highest point of the island is near the center. **Herbert Graves Island**, on the south side of the harbor, is sparsely wooded except for a high, wooded hill on the eastern part, which is a prominent landmark. The western half of the island is low and rolling with numerous small lakes and swampy areas. **Mount Lydonia** is on Chichagof Island eastward of the harbor, and is a prominent landmark, being the highest mountain in the vicinity.

Portlock Harbor is used chiefly by boats going through the inside waters to Ogden Passage. It has three entrances from the sea—South Passage, Imperial Passage, and Dry Pass. Imperial Passage is used by most vessels, although South Passage is equally good. Dry Pass is foul and is used only by small boats.

South Passage is between Cape Edward and **Point Hogan**, which is the southern point on Hogan Island. Reefs extend for 0.5 mile southward from Point Hogan.

Imperial Passage, between Hogan and Hill Islands, is the main entrance into Portlock Harbor. The group of islands off the northwestern side of Hogan Island form a good landmark, the outer ones being grass-covered and the inner ones having a few trees. Two reefs, awash, are 500 yards westward of the outer islands. The northern side of Imperial Passage is marked by **Hill Island Light (57°43.7′ N., 136°16.5′ W.)**, 60 feet above water, shown from a white skeleton framework on a house on the southern end of Hill Island.

Peer Islet, a bare rock 20 feet high, is in the passage about 500 yards eastward of the light, and there is a shoal extending southward of this rock with a depth of 1¾ fathoms 150 yards southward of the rock. Several shoal areas are off the entrance to the passage where a heavy sea will break.

Anchorage can be found in Portlock Harbor 300 yards northward of **Sholin Island**, in 7 to 18 fathoms, rocky

bottom. Anchorage can also be had at the junction of Goulding Harbor and Dry Pass in 15 to 18 fathoms. Most of the bays making off from Portlock Harbor are too deep for good anchorage.

Didrickson Bay has its entrance on the eastern side of Portlock Harbor 0.8 mile northward of **Lock Island.** Between sunken rocks and reefs on each side, the entrance is deep and clear. A 6-foot waterfall at the head of the bay can be seen from the entrance. Good anchorage can be had near the head of the bay in 4 to 15 fathoms, mud bottom.

Pinta Bay extends northward for 2 miles from Portlock Harbor. Two small, wooded islands on the western side of the entrance are joined by a reef which bares. Eastward of these islands the entrance is clear.

Goulding Harbor, at the northwestern end of Portlock Harbor, has two branches. **Baker Cove** is the northwest branch. The northeastern branch terminates in a shallow cove, bordered with sand and gravel flats. With local knowledge it is possible to take launches of 4 feet or less draft to the head of the cove where a large stream empties into the bay. A small gold mine is about 1 mile inland. Most boats coming to the mine anchor immediately after rounding the first point of the cove and near the western shore. Soundings taken at the entrance to the northeastern branch show a depth of 1 fathom on a reef of considerable size, extending from the south point of the entrance to the arm.

Dry Pass, the northern passage from Portlock Harbor to the Pacific Ocean, is northward of Hill Island. For 0.3 mile from the western end, the pass is less than 0.1 mile wide and is foul. A narrow channel with depths ranging from 3 to 10 feet passes between rocks at the entrance and to the southward of a rock in midchannel, 0.1 mile from the western end and to the southward of a small rocky islet near the northern shore, 0.1 mile from the east end of this section. The pass then expands into a basin with a group of islets at the southwest end.

Anchorage in Dry Pass is reported in the cove on the northern shore back of a large island in 6 fathoms, sticky bottom, and also in the cove on the southeastern shore in 4 to 7 fathoms.

From the northeast side of the basin the pass continues in a northeasterly direction for about 0.6 mile and then turns southeastward to Portlock Harbor. A small island with Indian graves on the western end and a small rock close to its southern point is at the turn of the pass near the northern shore.

The coast from Imperial Passage to Lisianski Strait is very irregular and characterized mainly by bold cliffs, rocky beaches, and many small islands, inlets, and bays. The immediate shoreline and larger islands are well wooded, but the rolling country back from the beach are stretches of open marsh with lakes or tidal lagoons. Two or three miles inland the mountains rise to elevations of 2,000 to 3,000 feet and are generally bare above 1,200 feet. **North Mountain,** about 1.8 miles to the northward of Mirror Harbor, which is 4.3 miles northward of Hill Island Light, is timebered to an elevation of about 1,600 feet and appears dark against the peaks beyond. As seen from the southward it shows cone-shaped, with a shoulder 220 feet lower extending to eastward. **Mount Douglas,** a rounded double peak, lies about 1.5 miles eastward from Mirror Harbor.

Dangers.—There are many outlying rocks and breakers along this coast and many rocks and shoals extend northward from Cape Dearborn. Several rocks are southward of Skinner Island, and several sunken rocks are southward from Porcupine Islands.

Cape Dearborn, the western extremity of Hill Island, is a bold bluff about 80 feet high and has several small rocky islets close-to.

Little Bay is 1.5 miles northeastward from Cape Dearborn. **Point Weigle,** the north point of the entrance, is 1.5 miles north-northeastward from Cape Dearborn. The entrance to the bay is wide and clear, except near the shores and has a depth of about 11 fathoms decreasing to 2½ fathoms near the head of the bay where it is foul.

Cormorant Island, Shag Rock, Grace Island, Middle Island, and **Snag Island** form a group about 1.7 miles northward from Cape Dearborn. **Fern Rock, Gull Rock,** and a rock awash midway between the two, are 270 yards northward of Grace Island. **Davison Bay,** the bight eastward and northeastward of this group, has depths of 4 to 12 fathoms.

Fleming Island is 2 miles northward of Cape Dearborn. **Mirror Harbor** is northward of Fleming Island and has depths of 3 to 4 fathoms in the middle. The channel leading to the harbor is between Fleming Island and the group to the westward. It is intricate, narrows to about 10 yards, and in places has depths of 1 fathom. Local knowledge is required for safe passage.

Point Shultz is the southern point of Fleming Island, and **Fairway Rock** is 275 yards southwestward from Point Shultz. **West Arm,** northward of **Pluma Island,** is foul.

Skinner Island is the most westerly of the group on the western side of the entrance to Mirror Harbor. A rocky islet is 300 yards westward and breakers and foul ground extend 0.8 mile south-southwestward.

Caution Pass is close eastward of Skinner Island and between it and the islands to the eastward. It is used by small local launches going to Bertha Bay.

Bertha Bay, an open bight about 1 mile wide, extends in a northerly direction from Skinner Island. The bay is rocky at the head and is very foul; it affords little protection from the ocean swell. Even small boats must keep over 600 yards from the shore to avoid rocks and reefs. **White Sulphur Springs** and a few buildings are on the north side of the bight. The beach is rocky, and landings at the hot springs can only be made in smooth weather. A house with a red roof is on the northern side of the bay 0.5 mile eastward of the hot springs.

Porcupine Rock is a prominent bare rock, about 1.4 miles westward of **Beric Island,** the westernmost of the Porcupine Islands.

Porcupine Islands, so named form the shape of the outer one, are three wooded islands, lying 2 miles eastward of Porcupine Rock and about 1 mile offshore. Extensive bare ledges prolonged by breakers extend 0.5

mile southward from the islands. **Winifred Island,** the largest of the group, is used as a fox farm. Two rocky islets are about 0.5 mile northward of Porcupine Islands, and a sunken rock with 2½ fathoms over it and showing a breaker in a moderate sea is nearly 300 yards northwestward of the rocky islets.

Islas Bay extends northward from Porcupine Islands. On its northwestern side are numerous inlets, most of which have shoal water and rocks at the entrances. Ilin Bay and Porcupine Bay branch off from the northern end.

Porcupine Bay is about 0.3 mile in diameter and has general depths of 8 to 12 fathoms. A wooded island 90 feet high is in the western part of the entrance. The entrance southeastward of this island is clear. The western entrance is shoaler and narrower. A waterfall at the northeast end of the bay shows from the entrance. The harbor affords protected anchorage.

Ilin Bay, narrow, rocky, and suitable for small craft only, has its entrance 0.5 mile westward of the entrance to Porcupine Bay. An anchorage in 8 fathoms, mud bottom, is in the upper half of the bay, but this anchorage is exposed to the southward. A more protected anchorage is in **Zhilo Cove,** behind the islands, on the eastern side of the bay in 3 to 4 fathoms, mud bottom. The southern and western entrances between the islands leading to this anchorage are foul, but the northern entrance at the head of the bay is clear.

Chart 8260.—Lisianski Strait, between Yakobi and Chichagof Islands, about 11 miles long and from 0.2 to 0.8 mile wide, follows a general northerly direction and connects Lisianski Inlet with the Pacific Ocean. The waters throughout the strait are generally deep, but the southern entrance is foul. From the southern end northward, the strait is clear until 1.2 miles to the southward of the junction with Lisianski Inlet, where there are two small islets, the northern grass-covered with a lone tree on it, the southern rocky and wooded, with several rocks close-to. Kelp extends from the islets to the Chichagof Island shore.

From the southern entrance the land presents a succession of low, wooded hills, gradually rising to sharp rocky peaks.

Currents.—Outside the rocks and reefs at the southern entrance the current floods to the northward and ebbs to the southward. Near the entrance among the rocks, on the ebb, a set to the southeastward has been experienced. Tide rips are encountered here, with an ebb current against the wind. Swirls are formed in the vicinity of Esther Island, and the current has been reported to exceed 3 knots at times. From Esther Island to about 0.5 mile to the southward of the islands near the northern entrance the current is slight; 0.5 mile to the southward of the islets swirls and eddies are formed. Along the islets a current of 0.5 to 2 knots is found flooding to the north and ebbing to the south. To the northward of the islets the current is small. In the vicinity of Miner Island currents vary from 0.5 to 2 knots. Between Miner Island and Chichagof Island eddies and swirls occur. The currents from Cross Sound and Lisianski Strait appear to meet in the vicinity of Miner Island. An ebb current of 0.5 knot from Stag Bay has been experienced.

The southern entrance channel to Lisianski Strait is about 125 yards wide, with a reef on the eastern side with 2½ fathoms on it and rocks on the western side. Favor the western side, especially if the current is ebbing, as then, there is a southeasterly set.

Point Theodore, on the western side of the southern entrance, is low and wooded, with a background of high mountains. Two wooded islands are within the entrance close to the point. Rocks and reefs, bare at various stages of the tide, extend for 0.5 mile in a southerly direction from the point.

Star Rock, about 0.9 mile southward of Point Theodore, is awash at high water; a bell buoy is moored about 200 yards southwest of the rock.

Point Urey, the eastern point of the southern entrance to Lisianski Strait, is low, flat, and timbered; it has a small sharp knob near the southern end. Rocks and foul ground extend 1.4 miles off the point, the most prominent being Porcupine Rock. Sunken rocks and rocks awash at high water are about midway between Porcupine Rock and Point Urey. **Threenob Rock,** a conspicuous triple-headed rock, is 0.4 mile southwestward from the point.

Urey Rocks, about 0.8 mile westward from Point Urey, are two bare rocks; the eastern rock being longer and wider. Several small rocks close-to, lie to the northward and northwestward. Kelp extends to the shore of Chichagof and Esther Islands.

Esther Island, just within the entrance, is heavily timbered. Near the middle of the island on the eastern side is a bight which almost cuts the island into two parts and where during storm tides the seas nearly wash across. The eastern shore of Esther Island is on the western side of what is known locally as the **Inside Passage.** Rocks awash, extend for about 0.5 mile northward of the north end of Esther Island. **Lisianski Strait Entrance Light (57°50.7′ N., 136°26.0′ W.),** 45 feet above the water, is shown from a small white house on Esther Island. The light, most brilliant on the bearing 044° and diminishing in intensity around the remainder of the horizon, marks the southern entrance to the strait.

Lumber Cove is a small-boat anchorage northwestward of Point Urey. Midway in the entrance is a small steep island which is covered with trees. In entering pass close to the island, leaving it to southward. When clear of the island, pass in midchannel and anchor near the head of the cove in 5 to 6 fathoms, sticky bottom.

Canoe Cove, about 1.5 miles from Point Urey to the eastward of Esther Island, furnishes anchorage for small boats in 4 to 5 fathoms, sticky bottom. The anchorage is small, about 250 yards wide. It has two entrances, known locally as the **North Pass** and the **West Pass;** both are narrow. At low water North Pass bares for a short distance while West Pass has about 1 foot at its shoalest part. At the seaward end of West Pass is a heavy growth

of kelp. A good supply of fresh water will be found on the east side of the cove. Lumber Cove and Canoe Cove are connected at high water by narrow **Canoe Pass.**

Lost Cove, about 1 mile above the light on Esther Island, affords anchorage for small vessels in 11 to 17 fathoms, mud bottom. The anchorage is about 300 yards wide. Midway between the entrance points is a rock which uncovers 5 feet and is marked by kelp during the summer and fall. Fresh water may be had at the head of the arm near the end of the cove.

Stag Bay is on the east side of Lisianski Strait, 6 miles from the southern entrance. The shores are steep and precipitous, the land rising rapidly on each side. The slopes are timbered to an elevation of about 600 feet, and to an elevation of about 1,000 feet with a scrub growth, above which the entire country is generally barren. About 2.5 miles from the entrance on the south side is **Cub Mountain,** a prominent peak, which from the entrance shows steep on the northern side near the summit, with a shoulder on the southern side. At the head of the bay is an extensive tide flat, the greater part of which bares at lowest tides and the approach to which is very steep. Depths within the bay range from 27 fathoms at the entrance to 40 to 70 fathoms inside.

On the north shore 2 miles from the entrance are the ruins of a small wharf on the edge of a flat. Near the ruins is a fair-sized stream. At the head of the bay near the south side is **Stag River** which has a small waterfall that affords facilities for filling small boats. Along each shore are mountain streams at the mouths of which banks have been formed which extend offshore for 100 to 150 yards. In entering follow midchannel courses. There is an anchorage at the head of the bay off the flats in 40 fathoms, with restricted swinging room; this anchorage is not recommended.

Rock Point, at the south side of the junction of Lisianski Strait and Lisianski Inlet, is marked by a light.

Miner Island, at the junction of Lisianski Strait and Lisianski Inlet, is separated from Yakobi Island at high water by a channel about 100 yards wide. It is heavily wooded and surrounded by kelp.

Junction Island, a small wooded island, lies in Lisianski Inlet about 0.5 mile off the Chichagof Island shore and 0.9 mile to the southeastward of Miner Island.

A rocky ledge extends about 200 yards to the northward from Junction Island; kelp extends about 50 yards beyond this. Two rocks, each covered ¼ fathom and marked by kelp, are 0.2 mile and 0.5 mile northward of Junction Island.

Yakobi Island is densely wooded in its lower portions, but contains many high, bare, mountain peaks. The southern and northern parts of the island are low; the interior and eastern parts are high. The western coast of the island is broken by many islands and offlying rocks into numerous bays and bights, forming frequent shelter for small craft.

Between Point Theodore and Squid Bay are numerous small islands, mostly wooded, the outermost and most prominent being **Greentop Island** which is marked by a light. Close to northeastward of Greentop Island is a narrow arm extending in a northeasterly direction. Along its north shore about 0.3 mile from the head, a fish-buying scow anchors each year from May 1 to September 15. All fisherman supplies, including provisions, gasoline, diesel oil, and kerosene, are available. About 200 feet of mooring float is available for small craft. Fresh water can be had at the float. Radio communication is maintained with Pelican.

Enter north of Greentop Island, passing north of the two large islands and the small elbow-shaped island. Favor the north shore of the arm, being careful to avoid the rock near the north shore.

Secure anchorage may be had either north or south of the float in 4 to 7 fathoms, mud bottom. A large anchorage is on the eastern side of the arm. This anchorage has a depth of 5 to 8 fathoms, mud bottom, but there are rocks which bare in the entrance, and caution is required in entering. The other passages among the islands are foul and should not be attempted except by very small craft with local knowledge.

Squid Bay is about 2.5 miles northwestward of Point Theodore. The anchorage here is in 5 to 17 fathoms, soft bottom, exposed to southward. The entrance is clear and is bounded to eastward by the high, wooded shoreline, and to the westward by a large area of foul ground which extends to Point Satchrun. All vessels should keep well away from this foul area. In entering, favor the southeastern shore.

Point Satchrun, on the eastern side of the entrance to Takanis Bay, is bold and wooded. The point can be identified by a prominent cross of white quartz in the dark basalt which forms the point. This cross is about 40 feet above the waterline and close below the tree line.

Takanis Bay has its entrance close westward of Point Satchrun. Several narrow arms make off from the bay in various directions. The bay is exposed to the southward, but small craft can usually find protected anchorage in its branches. The long narrow arm at the head of the bay is clear but has too limited swinging room for anchorage. The western half of Takanis Bay is foul and should be avoided.

The usual anchorage for small craft is in the northwestern branch, which contains a small, wooded island near its head. There is ample swinging room southward of this island in 6½ fathoms, mud and rock bottom. Very small craft anchor northward of this island, which affords more protection but limited swinging room, the best approach being eastward of the island.

Small craft with local knowledge sometimes anchor in the lagoon lying eastward of the upper end of Takanis Bay. The entrance is in the eastern shore of the bay, about 1.2 miles northward of Point Satchrun, and is through a long, narrow arm about 25 yards wide, between bold cliffs. The tidal currents through this arm are very swift, and this passage should not be attempted except at high-water slack and with good local knowledge. Anchorage in 8 fathoms, mud and rock bottom, can be

found in the middle of the bay, about 0.5 mile above the large flat rock on the east side of the bay just inside the entrance.

Cape Cross is about 5.2 miles northwestward of Point Theodore. The point is comparatively low and wooded and identified by a high, rocky islet lying 0.2 mile off the cape, on which is a prominent clump of trees. Two large, bare islets lie northward of this islet and are connected at low water. Foul ground extends for 400 yards westward and for 300 yards southward of the islet.

Between Takanis Bay and Cape Cross are numerous small islands, some of which are wooded. With local knowledge small boats can pass among these islands, but there is much foul ground and there are no protected anchorages. **White Crag Island,** the outermost island, lying about midway between Cape Cross and Point Satchrun, is bare, and has a conspicuous white top which forms a prominent landmark. Foul ground and breakers extend almost a mile southward of the cape.

Between Cape Cross and Surge Bay the coast is rocky and broken with numerous large rocks lying close to shore. The 20-fathom curve follows the coast at a distance of about 0.5 mile, outside of which there are no dangers. Off Surge Bay, however, the 20-fathom curve extends for more than 2 miles offshore, and there are several 8- and 9-fathom spots from 1 to 1.5 miles offshore; but there are no dangers more than 0.5 mile off the general coastline. Two miles northward of Cape Cross is a large bight. Considerable kelp is found here, and there is no protected anchorage even for small boats in the main part of the bight. In the southern part, east of the wooded island, is an inner bight, locally caller **Deer Harbor.** It is entered only on the upper half of the tide.

A bell buoy is moored in 5 fathoms 580 yards north of the northwesternmost extremity of **Takanis Peninsula.** A rock with less than 2 fathoms over it has been reported approximately 200 yards northeast of the buoy. To enter Deer Harbor pass south of the bell buoy and of the large wooded island.

Two fish-buying scows are anchored in Deer Harbor from May 1 to September 15. They each have all fishermen supplies, including provisions, diesel oil, and gasoline. There are mooring floats for small craft and fresh water is obtainable at the floats. Radio communication is maintained with Pelican. Sheltered anchorage may be had in either the north or south arm of the harbor in 4 to 7 fathoms, mud bottom.

Surge Bay, about 4 miles northward of Cape Cross, is an open bight with numerous rocks and is suitable only for small vessels with local knowledge. The small bights on the eastern side of the bay are open westward. The only protected anchorage for larger vessels is at the extreme northern end of the bay, the passage to which leads among numerous small islands and rocks. In about the center of the bay is a high rocky islet, with two grass-covered knolls on it, which is the best mark for the bay. The best entrance to the bay is southward and eastward of the islet; the entrance westward of it is through kelp, and in westerly weather breakers extend clear across the entrance.

Surge Bay Entrance Light (57°58.6′ N., 136°33.5′ W.), 74 feet above the water, is shown from a small white house on a small islet marking the southern entrance to Surge Bay. East of the light and in the protected arm of the bay, southeast of two small wooded islands, a fish-buying scow is moored from May 1 to September 15. All fishermen supplies, including provisions, gasoline, and diesel oil, are available. There is a mooring float for small craft and fresh water is piped to the float. Radio communication is maintained with Pelican.

To reach the scow approach it from the north. Enter the bay north of the island group where the light is located. Only vessels with local knowledge should attempt entrance to the bay and anchorage.

From Surge Bay to Cape Bingham the coast is very broken with many offlying rocks and islets. Most of the coves among these islets are foul and there are no protected anchorages for large vessels. There are no dangers extending more than 0.5 mile off the outermost islets.

Yakobi Rock is about 0.5 mile westward of Cape Bingham, and is the farthest offshore of the numerous rocky islets in the vicinity.

Hoktaheen Cove, a small, open, and exposed cove about 1.2 miles southward of Cape Bingham, is suitable only for small craft, and local knowledge is required for its entry. A small timbered knob is about 0.3 mile southward of the southern shore of the cove, and 1.5 miles southward of the cove are two somewhat sharp knobs.

Bingham Cove, on the south side of Cape Bingham, is open to westward. Its southern arm is well protected, however, and a fish-buying scow is moored there from May 1 to September 15. All fishermen supplies, including provisions, gasoline, and diesel oil, are available. There is a mooring float for small craft and fresh water can be obtained. Radio communication is maintained with Pelican. Local knowledge is essential for entering the cove.

15. CROSS SOUND AND ICY STRAIT

Chart 8202.—Cross Sound and Icy Strait are on the northernmost of the channels connecting the inland passages of southeast Alaska, separating the mainland between Cape Spencer and Point Couverden from Yakobi and Chichagof Islands between Cape Bingham and Point Augusta. The waterway is about 62 miles in length from Cape Spencer at the western entrance to Point Augusta, at its junction with Chatham Strait. It averages from 4 to 7 miles in width, but in places is reduced by islands.

Glacial ice in varying quantities is prevalent in Icy Strait and Cross Sound throughout the year. The ice comes from Glacier Bay, and most of it is usually found at Glacier Bay entrance and from there to Inian Islands. It is quite thick in Cross Sound and ice has been seen 10 to 15 miles seaward of Cape Spencer and as far eastward as Point Augusta. The size of the pieces is sufficient to make them dangerous to navigation. Ice at times piles up heavily along the shore from Point Adolphus to Eagle Point.

Currents.—The current from the sea sets northeastward on the flood into Cross Sound and Icy Strait and meets the flood current in Chatham Strait south of Point Augusta. The ebb current sets in the opposite direction. The velocity varies with the range of tide and width of passage. The ebb velocity is stronger than the flood.

In the wide portions of Cross Sound, the estimated velocity of the current is 2 knots on the flood and 3 knots on the ebb.

Between Inian Islands and Point Wimbledon, the current has a velocity of 1 to 5 knots on the flood and 3 to 8 knots on the ebb. When strongest, heavy swirls occur northwest of the Inian Islands. Daily predictions for times of slack water and velocity of the current in North Inian Pass, are given in the Tidal Current Tables.

South of the Inian Islands, in the narrowest part of the passage between them and Point Lavinia, the estimated velocity of the ebb current is 9 knots, and heavy dangerous rips and swirls occur, especially with an ebb current and westerly or southwesterly winds.

In North and South Passages of Icy Strait, the estimated velocity of the ebb current is 6 knots. There are swirls and tide rips at times off the entrance to Glacier Bay. At Point Augusta the tidal currents usually have little velocity. For daily predictions for places in Cross Sound and Icy Strait, see the Tidal Current Tables.

Strong tide rips occur at the entrance to Swanson Harbor with a slight southerly breeze.

On the south side of Icy Strait between Point Sophia and Point Augusta very little current is encountered. Occasionally, when weather indicates a southeast storm along the outer coast in the vicinity of the entrance to Chatham Strait, a current of 2 or 3 knots may be noted, flowing in a westerly direction along the shore in this locality. Its direction seems to be unaffected by the stage of the tide.

Chart 8304.—Cross Sound is that part of the passage westward of the Inian Islands. Icy Strait is that part eastward of Inian Islands.

The northern shores of the sound are mostly high, formed by the slopes of the Fairweather range. The southern side, formed by the Chichagof group, is comparatively low.

Caution.—From Cross Sound to Excursion Inlet, shoalings amounting to as much as 6 feet in several critical areas were disclosed during 1959. It is probable that these shoalings and others not yet discovered, were due to the major earthquake of July 9, 1958. Accordingly, mariners are urged to use caution in navigating over or near critical depths.

Chart 8260.—Cape Bingham, the northwest extremity of Yakobi Island and the southeastern point at the entrance to Cross Sound, is a low, irregular, rounding, wooded point with a gradual rise for about 1 mile to the interior. Numerous open glades occur in the vicinity. Low timbered islets and points extend offshore for a distance of about 0.4 mile.

From Cape Bingham to Soapstone Point the shoreline is of a very irregular and broken character and presents an almost continuous line of perpendicular cliffs with numerous indentations and inlets, at the heads of which are gradually shelving sand beaches. Numerous column-like pinnacle rocks and small rocky islets mark the entire shoreline.

Soapstone Point, on the western side of the entrance to Lisianski Inlet, is the extremity of a neck of land of bold appearance with a shoreline of steep cliffs. Westward is a small cove open and exposed and with depths of 8 to 9 fathoms at the entrance. Eastward is **Soapstone Cove,** a narrow inlet at the head of which is a valley through which a stream flows. Depths shoal rapidly from 19 to 20 fathoms at the entrance to less than 1 fathom 0.3 mile within the inlet. From the shoreline in the vicinity of the point the land rises rapidly and is generally timbered to elevations of about 1,500 feet. The bottom is very irregular for a distance of 1 mile in a northwesterly direction from this point. Rocks and kelp extend off the point.

Chart 8410.—Cape Spencer, the northwestern entrance point to Cross Sound is a conspicuous headland. Extend-

ing from the cape for about 1.2 miles in a southerly direction is a large shoal area in which there are rocky islets, some of the inner ones wooded, and rocks, the outer ones usually showing as breakers. From the shoreline the cape rises rapidly to timbered ridges.

Cape Spencer Light (58°11.9′ N., 136°38.3′ W.), 105 feet above the water is shown from a 25-foot white square concrete tower on a rectangular concrete building on the outermost large, rocky islet southward from Cape Spencer. A fog signal and radiobeacon are at the light.

Anchorage can be found in the cove about 0.5 mile northwestward of the light. It is entered from westward from the approach to Dicks Arm, passing close westward and northward of the buoy which is on the northwest side of a 2½-fathom spot.

Dicks Arm, a narrow inlet less than 200 yards wide in places, extends in a northerly direction for about 2 miles. From the head of the arm is a gradually rising valley, passing over a saddle to Taylor Bay. A narrow channel, with depths of 5 to 12 fathoms, passes through the offlying rocks and islets to the inlet, where depths of 4 to 7 fathoms are found to within 0.3 mile of the head, where it is shoal. A buoy marks the northwest side of a 2½-fathom spot on the eastern side of the entrance channel. **Zip Rock,** on the west side of the channel, is bare.

Chart 8304.—Taylor Bay, on the northwestern side of Cross Sound, has its entrance about 6 miles northeastward of Cape Spencer. The bay is open to the southeast. **Brady Glacier,** at the head of the bay, has a face about 2 miles long, about 400 feet high, and presents a broken, ragged appearance, with dark streaks. Off the face of the glacier there is an extensive flat which drops off sharply to 3 fathoms, deepening rapidly to 10 and 12 fathoms. The flat at the face of the glacier is extending rapidly down the bay. Vessels proceeding up the bay should use caution and keep sounding. Extensive shoaling has been reported in the upper half of the bay with bare spots in some places. The bottom is mud. The west side of the bay is shoal for 0.5 mile offshore.

Taylor Island, high and hummocky, forms the east side of the bay for 2.8 miles from the entrance with a bare rock 0.3 mile off the south end of the island and small rocky islets closer inshore. From Taylor Island a chain of reefs extend northwestward. There is no navigable channel between the reefs and the shore. Northwestward of Taylor Island is a small bight having depths of 3 and 4 fathoms.

Fern Harbor, the inlet on the eastern side of Taylor Island, extends about 1 mile in a northwesterly direction and is about 0.3 mile wide. Depths of 25 fathoms were found at the entrance and depths of 9 to 11 fathoms, sticky bottom, within the cove. A boulder reef closes the head of the bay except a narrow high-water channel near the Taylor Island shore. The harbor affords anchorage for small craft.

Chart 8260.—Lisianski Inlet follows a general southeasterly direction for 21 miles. There is temporary anchorage for vessels up to 150 feet in length off the eastern side of Miner Island in 20 fathoms, rocky bottom, poor holding ground. The vessel swings to the current and the effects of wind drawing through the channel are felt. Good anchorage and shelter may be had at the head of Lisianski Inlet in 15 fathoms, soft, sticky bottom. Small boats anchor alongshore where the depths are not too great, particularly in Mite Bay, off Miner Island, and off the flats alongshore.

Currents in Lisianski Inlet are reported slight and set fair with the channel.

In entering favor the southwestern shore until inside the entrance then follow midchannel courses. The chart is the guide.

If bound for Lisianski Strait, round Miner Island at a distance of about 300 yards. This passes close to an 8-fathom spot surrounded by deep water.

If bound for the head of the inlet, pass northeastward of Miner and Junction Islands, follow midchannel courses for about 5 miles beyond Junction Islands, then favor the southwestern shore until past the flats off the northeastern shore at Pelican and the 5-foot rock almost in midchannel 0.6 mile beyond. Follow midchannel courses until near the head of the inlet, then favor the southwestern shore through the narrows and proceed in midchannel to anchorage.

Column Point, the northeastern headland of Lisianski Inlet, receives its name from the column-line masses of rock that extends from its shores. The shoreline is rough and broken and is marked by steep cliffs 20 to 100 feet high. The land eastward rises rapidly and is timbered to elevations of about 1,500 feet. Small rocky islets and rocks awash, marked by kelp, extend about 0.4 mile offshore, just inside the entrance to Lisianski Inlet. The western extremity of the foul area is marked by a bell buoy.

Lisianski Inlet Light (58°05.9′ N., 136°27.9′ W.), 65 feet above the water and shown from a small white house, marks the western side of the entrance to Lisianski Inlet.

The western shore of Lisianski Inlet is bold but broken by a number of small bights. **Mite Cove,** 2.5 miles from the entrance, is the best anchorage for small craft. **Mite Islet** is off the northwestern point of the entrance. Kelp and rocks extend for about 50 yards offshore of the island. Depths of 13 to 20 fathoms were obtained in the channel eastward of the island, while to the southward depths of 5 and 6 fathoms were found. Protected anchorage may be had in 11 to 12 fathoms, soft bottom, in the center of the cove. There are several fresh-water streams, and at the head of the cove and on each side sand and gravel beaches. **Mite Head,** the southeastern point of the entrance is marked by a light.

A rock awash is 350 yards off the western shore about 5.8 miles from the entrance to Lisianski Inlet. There is deep water between it and the western shore.

Nose Head, on the east shore 6 miles in from Lisianski Inlet Light, is marked by a light.

The northeastern shore of Lisianski Inlet from inside the entrance to opposite Miner Island is clear. The beach is rocky, and the land rises rapidly to mountain ridges,

timbered to an elevation of about 1,500 feet. To the head of the inlet the shoreline is generally rocky with several islands and points with flats extending short distances offshore. The slopes of the ridges are moderate and heavily wooded. On the southwestern side the slopes are steep and the peaks are bare.

Pelican (pop. 135; P.O.), on the northeastern shore about 4.5 miles southeastward of Miner Island, is a customs port of entry. The port has a cannery, cold storage plant, general store, small sawmill, restaurant, hotel, school, and bank. Airmail and passenger service with Sitka and Juneau are maintained daily during the summer and 3 days each week in the winter.

A Federal project provides for a small boat basin dredged to a depth of 12 feet between the wharves on the north and a breakwater 1,000 feet long on the south.

Pelican Entrance Light (57°57.3′ N., 136°13.6′ W.), 20 feet above the water and shown from a small white house on a skeleton tower with a white square slatted daymark, is 150 yards off the end of the breakwater. Two rocky islets and rocks awash are south of the light and off the flat extending from the shore south of the breakwater.

The most westerly of three wharves in the bight, at the cold storage plant, is about 140 feet long, with a least depth of 20 feet. The middle wharf, at the cannery, has a face 100 feet long and least depth of 15 feet. The easterly one, an oil company wharf, has a least depth of 13 feet along its 62-foot face. A T-shaped mooring float for small craft is anchored in deep water beyond the oil wharf, and has berthing space of 800 feet. A landing float for planes is maintained. The wharves and basin are partially protected from southeast winds by the breakwater and the rocky islets. Supplies, fresh water, minor repairs facilities, and all petroleum products are available.

About 1.5 miles from the head, Lisianski Inlet is narrowed to a width of 0.1 mile by **Soloma Point,** a grassy point projecting from the northeastern shore. Beyond this the inlet widens to about 0.3 mile. At the head of the inlet is a flat which bares for about 0.5 mile. Two streams empty here, the northern about 60 yards wide and of considerable volume; the current is swift but the water is shoal. Beyond the flat is a grass-covered area, the western end of a large valley.

Chart 8304.—Port Althorp, on the southern side of Cross Sound, between Point Lucan and Point Lavina, with Three Hill Island and George Islands across the entrance, narrows to an inlet about 0.2 mile wide near the head. Three passes lead to Port Althorp.

Point Lucan, 3 miles northeastward of Column Point, is a prominent wooded headland. From Column Point to Point Lucan the shoreline consists almost of unbroken precipitous cliffs 50 to 100 feet high, with the exception of a narrow strip of sand beach 0.5 mile south-southwestward of Point Lucan. Heavy masses of kelp extend offshore for 0.2 to 0.5 mile. A small rocky islet is 0.4 mile offshore 1.2 miles northward of Column Point. From the shore the land rises rapidly and the slopes are heavily timbered.

Three Hill Island, northwestward of Point Lucan, has three prominent wooded hills separated by low saddles; the southeastern summit is somewhat flat; the northwestern summit appears conical. The southwest shore is fringed with rocks and rocky islets. Off the southeastern extremity of the island are two small rocky islets close together, about 25 feet high. A light is on the westerly islet. Between the light and the rocky islet off Point Lucan is a deep water channel 0.2 mile wide.

George Islands a group of four islands at the entrance of Port Althrop, are about 8 miles northeastward of Cape Bingham. The larger islands are sparsely wooded. The two northern islands are small with off-lying rocks extending about 0.1 mile in a northerly direction. A light is on an islet off the northeasternmost island.

The westernmost and largest of the George Islands is irregular in shape with a deep indentation. **Granite Cove,** on its southern side is open to the southward. The sides of the cove are irregular cliffs while the head is a shingle beach. A shoal point extends for about 150 yards from the rock off the point on the western shore of the cove where the shoreline turns westward.

Local magnetic disturbances.—Differences of as much as 3° from normal variations have been observed on George Islands at the head of Granite Cove.

From a low depression in the center of the island, at the head of Granite Cove, the land rises to the southward to an elevation of about 300 feet, steep and with rocky cliffs on the southern side; northward of the depression the land rises less steeply to an elevation of over 200 feet. The western and southern shores are fringed with rocks and kelp.

The easternmost island, separated from the western island by a narrow channel with a depth of 3¼ fathoms, rises to an elevation of over 100 feet; the shores are fringed with kelp and rocks, and kelp lies off the southern end, close-to. On the southern side of the island is a white grave stone 4 feet high and 30 feet above water cemented to the bare rock outcrop.

Gaff Rock is about 0.4 mile westward of the southern end of the western George Islands. There is no safe passage between the rock and the island; kelp surrounds the rock, and there is a kelp patch to the eastward.

Currents.—Current observations in the entrance eastward of George Islands indicate that the current usually flows northward with a varying velocity which reaches a strength of about 2 knots 2¼ hours before flood strength in North Indian Pass; see the Tidal Current Tables.

Point Lavinia, about 10 miles eastward of Cape Spencer, is the northern headland at the entrance to Port Althorp. The point appears to form a little bluff at its extremity with rather low land behind it, rising in a southeast direction. It is wooded and depths of 2¼ to 5¼ fathoms extend 200 yards off the point. A light is shown from Point Lavinia.

Elfin Cove is a narrow inlet in the northeast shore of Port Althorp southeastward of the eastern George Islands. An islet is in the middle of the entrance to the

cove with channels on either side of it. The main entrance channel, south of the islet, is marked by **Elfin Cove Light (58°11.7′ N., 136°21.0′ W.)**, 48 feet above the water, shown from a small white house on the southern entrance point. The channel then continues between rock ledges and through a narrow cut into the inner harbor.

A Federal project provides for dredging depths of 10 feet in the outer entrance channel and 8 feet in the inner cut.

The principal danger in the approach to the cove is a 1¾-fathom rock, marked by kelp, about 520 yards north-northwest of Elfin Cove light. The rocky ledges on the side of the entrance channel are marked by daybeacons.

The harbor affords protected anchorage in either of the two basins in the inner harbor and is extensively used by small fishing vessels.

Elfin Cove (P.O.), a village on the northeast side of the harbor, has two trading posts and two oil stations with floats. There are a number of small landings along the shore. The village has scheduled mail and passenger air service and radio schedule is maintained with Alaska Communication System.

Althorp Rock, about 15 feet high and marked by a light, lies in the middle of Port Althorp, about 1 mile eastward of Three Hill Island. Several rocks which cover lie close-to. A group of rocks, several of which show at high water, are westward of Althorp Rock; kelp usually marks the rocks. Deep water is found between the patches, but the use of these channels is not recommended.

On the eastern shore of Port Althorp, about 5 miles southward of Point Lavinia, is a cove with a small island near the northern shore and a small islet with rocks close-to near the eastern shore. Depths of 18 fathoms near the head to 29 fathoms in the middle were obtained. From the northern part of the cove an inlet extends eastward for about 0.3 mile to a bight about 0.3 mile in diameter; flats extend for a considerable distance off the northern shore. Depths of 1 fathom were found in the bight and in the channel.

There are some cannery buildings on the southwest shore of Port Althorp, about 1.5 miles from Point Lucan. In 1960, only wreckage and a few piles remained alongside the cannery piers. Anchorage may be had in 15 to 20 fathoms, mud bottom at the head of Port Althorp. Small craft anchor closer in, near the head in 5 fathoms, soft bottom. In entering, the channel eatstward of the islet is preferred. At the head of the bay is a flat with a stream emptying into the southeast corner.

The **Inian Islands,** consisting of five principal islands, five smaller islets, and a few rocks, lie between Point Wimbledon and Point Lavinia and separate Cross Sound from Icy Strait. They are close together, mountainous, and wooded. The northwestern island rises to a conical peak with a shoulder on the southeastern side. **North Inian Pass Light (58°16.3′ N., 136°24.0′ W.)**, 64 feet above the water, is shown from a small white house on the northwestern point of the northwest island.

South Inian Pass, connects Cross Sound and Icy Strait southward of the Inian Islands. Two shoal spots lie off the point on the southern side of the pass at the eastern entrance; the northern one, a rock awash, is marked by a lighted bell buoy; the southern spot is covered by 2 fathoms.

South Rock, at the entrance to the bight in the south side of the pass, and **Dad Rock,** at the entrance to the irregular indentation in the northern side of the pass, bare, and are marked by kelp. There are no dangers in South Inian Pass proper and no anchorages.

The **current** is stronger than in North Inian Pass, approaching 9 knots on the ebb at times. The flood is considerably weaker. Severe tide rips and swirls occur, especially at the western entrance, with an ebb current and westerly or southwesterly wind.

Coming from the eastward and rounding into Port Althorp, Point Lavinia should be given a berth of not less than 225 yards to avoid the 2¼-fathom spot northwestward of the point. Ice is occasionally encountered.

Earl Cove is the indentation about 400 yards wide in the eastern side of Inian Islands. It is clear, and a small vessel may anchor here temporarily in 10 to 15 fathoms, but it is exposed eastward, and generally has considerable ice.

North Inian Pass is between the northern coasts of the Inian Islands and Point Wimbledon. A rock awash is about 0.6 mile northeastward from the northeast entrance point of Inian Cove, and about 0.2 mile offshore; a sunken rock is between this shoal spot and the shore.

Point Wimbledon, about 3 miles eastward from the southern extremity of Taylor Island, is a bold headland rising sharply to about 0.8 mile off the beach, then with less slope to higher peaks to the northwest. It is thickly wooded and presents a continuous shoreline of gray cliffs about 50 feet high. In the bight between Taylor Island and Point Wimbledon is a rather prominent headland off which a shoal extends for about 0.6 mile. Ice from Glacier Bay is frequently encountered.

Inian Cove, on the north side of Inian Islands, is a secure anchorage with a clear width of 600 yards. Its entrance is about 0.8 mile eastward of the northeastern point of the westernmost Inian Island. A small grassy islet with steep rocky sides is off the north point of the entrance. Kelp grows in deep water on both sides in the entrance. Ice drifts into the cove, usually along the south side, but is not considered dangerous to vessels at anchor. An abandoned fox farm is near the head of the cove. Fish-buying barges moor in the cove during the fishing season.

Approaching from eastward pass northward of foul ground extending 0.2 mile off Inian Islands, 0.5 mile eastward of the entrance to the cove. From westward the approach is clear. Enter in midchannel and steer eastward so as to keep the north shore aboard, distant 100 yards, in the narrowest part of the cove. Anchor in the wide part of the cove in 7 to 9 fathoms, soft bottom.

Chart 8202.—Icy Strait extends from Inian Islands in an easterly direction for about 16 miles to Point Adolphus, where it takes a southeasterly direction for about

27 miles to its junction with Chatham Strait. It averages 6.5 miles in width but in places this is reduced by islands.

Glacial ice from Glacier Bay is prevalent in the strait in varying quantities throughout the year. The size of the pieces is sufficient to make them dangerous to navigation.

Chart 8304.—Point Dundas, the eastern point of the entrance to Dundas Bay, on the north shore of Icy Strait to the northward of Inian Islands, is bold, steep, and wooded. There is deep water close to the point, the 50-fathom curve being less than 0.2 mile offshore.

Dundas Bay has its entrance on the northwest side of Icy Strait, northward of Inian Islands. The main bay is about 2 miles wide and 4 miles long in a northwesterly direction. The northern end of the main bay is filled by flats to a distance of 1.3 miles from its head, between which is a channel of very deep water leading northward toward the mouth of the **Dundas River** at its head. Westward of the flats is a channel along the southwest shore of the bay leading into the narrow crooked inlet which extends 5 miles in a northwesterly direction, and then turning abruptly southward, reaches to within 1 mile of Taylor Bay, with low land between.

Anchorage in 8 to 12 fathoms, sticky bottom, can be had about 0.3 mile off the western shore, opposite a wooded islet, about 3 miles northward off Point Wimbledon. The only danger is the flat about 0.6 mile eastward of the islet. The anchorage is exposed southeastward, and heavy ice drifting with the current is sometimes troublesome. At the anchorage the tidal currents have an estimated velocity of 2.5 knots.

Idaho Inlet has its entrance on the southern shore southeastward of Inian Islands. A shoal extends nearly 0.2 mile westward from the eastern point at the entrance to Idaho Inlet. Anchorage can be made in 15 fathoms in the entrance to **Gull Cove,** on the eastern shore of the inlet just south of this point. At low water a small vessel can select an anchorage closer in, with better shelter from northerly winds in depths of 15 fathoms. The mail boat from Juneau makes weekly calls. A fish trap with a small building is offshore in 16 fathoms in the northwest part of Gull Cove. A fishermen's settlement is on the eastern shore of Idaho Inlet about 2.5 miles south of Gull Cove.

Shaw Islands, two in number and wooded, are on the western side nearly 2 miles inside the entrance. The islands are connected by a ledge, but a good channel is on each side of them. A midchannel course leads safely to the head of the inlet, where there is anchorage in 18 fathoms, mud bottom, in the middle about 0.4 to 0.5 mile westward of two wooded islets. Small craft find anchorage closer to the head of the bay in 5 to 10 fathoms. A marker at the head of the bay marks a trail which extends inland for about 6 miles to the head of Tenakee Inlet. The trail is maintained by the Forest Service.

Lemesurier Island lies in the middle of Icy Strait, 4 miles eastward of the Inian Islands. **Lemesurier Island Light (58°19.2′ N., 136°02.3′ W.),** 42 feet above the water, is shown from a small white house on the northeast point of the island. The island is heavily timbered, and has several summits. A small wooded island lies about 200 yards off the northwest shore. A shoal extends 0.4 mile offshore from the eastern side of the island about 0.4 mile from the northern point; a reef extends about 0.2 mile from the southeast point of the island. **Willoughby Cove** on the southeast side of Lemesurier Island, affords anchorage in 8 to 10 fathoms in the eastern part of the cove about 0.2 mile off the beach; a strong eddy sweeps in icebergs and its use is not recommended.

North Passage and **South Passage,** northward and southward of Lemesurier Island, are clear. North Passage is more often used, furnishing a more direct passage to the sea. The southern shore of South Passage should be given a berth of at least 0.8 mile to avoid the reef and sunken rocks off Goose Island.

Local magnetic disturbance.—Differences of as much as 7° from the normal variations have been observed in North Passage.

From the eastern point at the entrance to Idaho Inlet the shoreline is low and wooded and trends to the eastward for 4 miles to **Mud Bay. Mud Bay River** empties through the sand spits at the head of the bay, off which flats extend for 0.6 mile. On the western side of the bay are three wooded islands, separated from the mainland by a narrow channel which bares. Foul ground, bare in places, extends 0.5 mile offshore from the northwestern point of **Goose Island,** the largest of the wooded islands. There is a depth of 5 fathoms 2 miles 077° from **Quartz Point,** the northeastern point of Goose Island.

Anchorage may be had in 6 to 9 fathoms, 1 mile from the head of Mud Bay, but is exposed from north to west, and at times considerable ice is encountered. In entering from the westward, the northern shore of Goose Island should be given a berth of at least 0.8 mile and Quartz Point a berth of 0.5 mile.

Point Adolphus, marked by a light, is the northernmost point of Chichagof Island. It is a bold prominent point covered with timber and rising to a rounded summit. About a mile southward is another rounded peak. The shoreline between Mud Bay and Point Adolphus is fairly regular. **Pinta Cove,** the bight on the east side of Point Adolphus has been used as a temporary anchorage, but it is not recommended.

Flynn Cove is on the south side of Icy Strait, about 7 miles southeastward of Point Adolphus southeastward of **Eagle Point.** It furnishes anchorage in its southeastern part in 6 to 8 fathoms. A shoal extends 300 yards northwestward from the northwestern extremity of **Burger Point,** the high wooded peninsula forming the northeast side of the cove. **Harry Island,** small and wooded, is in the entrance 600 yards northwestward of this point. A half-tide reef is 0.3 mile westward of Harry Island. A sunken rock is reported to be about 50 yards southeastward of Harry Island.

The best entrance into Flynn Cove is between Harry

Island and Burger Point, favoring Harry Island. At low water the entrance from westward may also be used, passing in midchannel westward of the half-tide reef.

Pleasant Island, on the northern side of Icy Strait about 4.5 miles northeastward of Point Adolphus, is comparatively low. **The Knob,** near the middle of the southern shore, is a prominent wooded knob. **Noon Point** is the eastern extremity of Pleasant Island. Rocks and kelp extend 0.4 mile off the point.

Icy Passage Light (58°23.2′ N., 135°37.6′ W.), 22 feet above the water and shown from a small white house on a square concrete foundation off the north shore of Pleasant Island, marks the south side of **Icy Passage,** the channel between Pleasant Island and the northern shore. Mud flats extend off the northern shore to within 0.5 mile of the northern shore of Pleasant Island. The shallow cove on the north shore of Pleasant Island, southeast of the light, offers fair shelter in 2 to 10 fathoms, mud bottom. Several mooring piles are in the cove.

Gustavus (P.O.) is a settlement on the north shore at the mouth of **Salmon River.** A lighted buoy marks the edge of the flat eastward of the river entrance.

Pleasant Island Reef is an extensive reef, 1 mile southward of Pleasant Island. A lighted bell buoy marks the southern edge of the reef. Between the reef and the south shore of Pleasant Island is a 3¼-fathom spot; between this spot and the reef is a narrow channel.

Charts 8302, 8304.—Porpoise Islands, a group of four islands, are off the eastern end of Icy Passage, about 2 miles eastward of Noon Point, Pleasant Island. The southernmost and largest island is high and wooded, and has a prominent yellow cliff 300 feet high on the southern side. The northwestern end of the island is a long low point, terminating in a clump, beyond which, a sand spit extends almost to the next island. An aviation light is shown from the summit of the largest island.

Foul ground extends off the island in places for almost 0.2 mile. Anchorage may be had in about 15 fathoms, mud bottom, off the west side of the island, with the tangents of the largest island bearing 031° and 125°

Excursion Inlet, a deep, clear, narrow inlet in the northern shore of Icy Strait, has its entrance northward of Porpoise Islands. About 2.5 miles northeastward of the western entrance point is an extensive area of low land on the eastern side of the inlet. The inlet divides into two arms 4.5 miles inside the entrance.

A cannery on the eastern shore of Excursion Inlet, about 2 miles below the dividing point, has a wharf with a 130-foot face. Vessels usually stem the current, making either a port or starboard landing. The flood current is reported to set about parallel with the face of the wharf; the ebb sets off the wharf, particularly during the first part of the ebb. At low water, large vessels will ground at the bilge keel next to the wharf in soft mud, but will have 25 to 30 feet at the keel line, the shoalest water being at the southern corner of the wharf. The oil wharf, 165 feet southward of the cannery wharf, has a least depth of about 20 feet at the face and a length of 40 feet. The cannery operates a general store during the season. Fresh water can be obtained on the wharf. Gasoline, diesel oil, and fuel oil are stored for cannery use.

Vessels will find indifferent anchorage near the head of the east arm, 0.2 mile from the eastern shore, in about 30 fathoms, 0.6 to 0.8 mile above an abandoned cannery. Small craft can select anchorage in about 10 fathoms in the coves at the head of the west arm.

Charts 8202, 8304.—Glacier Bay has its entrance on the northern side of Icy Strait between Point Gustavus and Point Carolus. It is about 37 miles long to the head of Muir Inlet and 56 miles to the head of Tarr Inlet, its northwest arm, at the Canadian border. From Point Gustavus to Willoughby Island the eastern shore, including Beardslee Islands, is low and quite shelving, and the western shore is low for a short distance back; above Willoughby Island both shores of the bay are steep and foul, and should be avoided. All the shoals of less than 6-fathom depth are covered with kelp part of the year, but this kelp cannot be depended upon to indicate the dangers as the strong current tows the kelp under most of the time.

Glacier Bay National Monument, 3,590 square miles in area, comprises all of Glacier Bay. It contains over 20 tremendous glaciers and many others almost equally impressive. They illustrate all stages, from actively moving ice masses to those that are nearly stagnant and slowly dying. Transportation facilities are limited, and there are no public accomodations. Canadian cruise ships enter the bay weekly during the summer season.

The **tidal currents** from Point Gustavus to Willoughby Island at times attain a velocity of 6 knots or more. Heavy tide rips and swirls occur abreast Beardslee Islands, especially off the channel southeastward of the northwest island of the group. From this channel the ebb current sets across the bay and meeting the direct current coming down on either side of Willoughby Island produces heavy swirls and rips during large tides, especially dangerous when the ice is thick. The ice in the swirls moves in all directions with varying speed, and it is nearly impossible to get through without striking if the ice is thick. The water is shallow enough to ground the largest bergs, forming temporary dangerous obstructions in places. The floating ice rushes past these grounded bergs with great velocity. Above Willoughby Island the currents have little velocity. For predicted times and velocities of the current see the Tidal Current Tables.

Ice.—Numerous discharging glaciers enter the bay, and glacial ice is always present, sometimes in enormous quantities. Large icebergs have been observed floating out of Muir Inlet. The quantity of ice discharged from Glacier Bay varies for different years. Those familiar with the locality report that earthquakes or earth tremors in the vicinity are concurrent with the periods of greatest discharge. When the ice falls from the faces of the glaciers, it may create waves 30 feet high. Therefore, small boats should not approach closer than half a mile to active glaciers. Icebergs also should not be approached

closely because, if disturbed by swell from the small boat passing, they may roll over.

Beginning in January, Glacier Bay is at times frozen in its upper reaches and in the bays and inlets where much fresh water is discharged. The greatest amount of float ice is found in the spring, and it lessens as the season advances. In June the ice in front of the glaciers, as seen from mountains farther down, appears to be solid at the head of the bay. More ice comes down the bay on the large tides than the small, and winds also exert a marked influence on the ice movements.

Usually the great mass of ice from Muir Glacier is congested in Muir Inlet and out into the bay to South Marble Islet, leaving the southwest shore from Willoughby Island to Hugh Miller Inlet comparatively free of ice.

The ice from Lamplugh, Reid, Johns Hopkins, Grand Pacific, and Margerie Glaciers is generally so scattered that vessels usually have little difficulty in passing through. Ice may be thick in Johns Hopkins Inlet.

Caution.—The navigation of Glacier Bay is not considered safe without local knowledge. The shoals are usually marked by grounded ice. Glacier Bay has not been completely surveyed above the line Francis Island to Tlingit Point, the western entrance Point of Muir Inlet, and the depths shown on the chart are from preliminary examinations.

Point Carolus, the western point at the entrance to Glacier Bay, is a low gravel and boulder point, back of which it is low and timbered; high land lies westward and northward.

An extensive reef and several rocks are off the point. Vessels in rounding Point Carolus should give it a berth of over 1 mile in order to stay outside the dangers. A small cove, into which a stream empties, is about 1 mile southwestward from the point.

Point Gustavus (58°23′ N., 135°55′ W.), the eastern entrance point to Glacier Bay, is low and wooded and does not exceed 200 feet in elevation. The beach is of gravel and boulders. It is advisable for all vessels to stay well outside Ancon Rock when rounding Point Gustavus. Old pilings of fishtraps lies in the area eastward of the point. A ¾-fathom spot is 1 mile northward of the point and the bottom in this locality is broken and uneven.

Ancon Rock, awash, is 0.5 mile southwestward of Point Gustavus. Broken ground, with depths of 3¾ to 5¾ fathoms and a possibility of less, extends 1.2 miles southward of Point Gustavus; it should be avoided. A rock which uncovers 2½ feet is about 0.4 mile west-southwestward from Point Gustavus.

Bartlett Cove, 4 miles northward of Point Gustavus, formed by the mainland on the southeast and Lester Island on the northwest, is large and affords good anchorage. It is open to the southwest but the holding ground is good. Occasionally ice gets into the bay and is at times troublesome to vessels at anchor. The best anchorage in the cove is about 0.2 mile off the southeast side in 7 to 10 fathoms, mud bottom, care being taken not to approach too close to the head of the cove. In southerly weather small boats can anchor close inshore on the southeasterly side of the cove, where there is a 300-foot T-head pier of the U.S. Park Service. There is 15 feet alongside the 115-foot head with two dolphins 30 feet off the ends. A mooring float with 13 feet alongside and an airplane float at the end is on the northeast side of the pier. The water on the northwest side of the cove is deeper; anchorage for large vessels is recommended in the center of the cove in 8 to 16 fathoms. Fresh water can be obtained at the mouth of the stream inside the bight.

extends for about the same distance off the west point of Glacier Bay at a distance of 1 to 1.5 miles for 4 miles from Point Gustavus to the entrance of the cove, and enter in midchannel. No dangers exist that are not connected with the shore except at the head of the cove and off the east and west entrance points. The reef making off the east entrance point is particularly dangerous. Foul ground extends for about the same distance off the west point of the entrance and is marked at times by kelp.

Beardslee Islands, low, hilly, and sandy, 4.5 miles above Point Gustavus, extend northward along the eastern shore and should be given a good berth. The southwest and west sides are quite shelving, and there are detached shoals northward of them for a considerable distance. Beyond these islands the eastern side of the bay has shoals and sand dunes formed by the glacial debris from the head of the bay; many of these shoals show only at low water.

Beardslee Entrance is the approach to the areas among the Beardslee Islands. The shoals at the entrance, although they have comparatively deep water over them, cause numerous swirls and tide rips. Among the islands are a number of anchorages, but local knowledge is necessary for their approach.

Sita Reef is about 0.5 mile northward of the northern side of **Strawberry Island.**

A group of reefs about 5.2 miles northward of Strawberry Island consists of coarse gravel and scattered boulders and is considered the northern extremity of the Beardslee Islands. The tidal currents in Sitakaday Narrows between **Rush Point** and the Beardslee Islands at times reach an estimated velocity of 5 knots.

Berg Bay is on the southwest side of Glacier Bay, 10 miles above the entrance. Two channels enter the bay. The passage northward of Netland Island is not recommended as rocks constrict the Glacier Bay end and low water the Berg Bay end of the channel. The controlling depth is 5 feet. The main entrance is between **Lars** and **Netland Islands.** A shoal, on which there is a ½-fathom spot, obstructs the channel at the Glacier Bay end. In entering Berg Bay, a vessel should pass midway between the ½-fathem spot and the low water line on the north side of the channel. The controlling depth is 22 feet. Care should be taken until past the shoal area making out from the southern shore. It is advisable to make passage at or near high water. Kelp grows in about 6 fathoms, but the strong currents make the kelp tow under most of the time except during slack water.

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A narrow, tortuous channel leads into the southeastern arm of Berg Bay but its use is not recommended as the bottom is rocky with many boulders. The currents are strong except for a short time immediately preceding and following high water. Below half tide there is a divided gradient between Berg Bay and the water in this arm.

Heavy ice grounds at the entrance to Berg Bay at times render it impracticable to enter or leave. With continued easterly winds the bay is filled by the smaller bergs. Ordinarily the bay is comparatively free from ice, and it is considered to be less troublesome to vessels at anchor than in Bartlett Cove.

Approaching from southeastward, **Lars Island**, on the southeast side at the entrance, shows detached from the shore and is readily identified.

There is good anchorage in about 18 fathoms about 1 mile inside the entrance. Small craft can anchor farther inshore for protection from southerly winds. Good anchorage, with protection from northerly winds, can be had in the northerly arm. There is also good anchorage for small craft in the westerly arm.

Willoughby Island is a mountain of bare rocks and three small islets are close to its north end. **Johnson Cove,** the small indentation at the northeast extremity of Willoughby Island, is partially protected from the ice by the small islands and affords some protection for small boats in all but southeasterly weather.

The main channel of Glacier Bay passes about 1 mile eastward of the Willoughby Island shore. **Whidbey Passage,** a well-defined and deep channel, separates Willoughby Island from the mainland to the westward.

Francis Island is a densely wooded islet, 1.4 miles northwestward of Willoughby Island, with a deep channel between. **Drake Island,** similar to Willoughby Island is densely wooded. The shores are rocky and steep, with short stretches of gravel beach.

Marble Islets, high and bare, and weathered to a slate color, are 1.4 miles apart; the southern one lies 3 miles northeastward of Willoughby Island. Just off the south end of South Marble Islet are some rocks awash, and relatively shoal water extends in a narrow ridge some 750 yards southeastward. A shoal marked by kelp, with a least depth of 1¼ fathoms, lies midway between **North** and **South Marble Islets** and make passage dangerous between them. Shallow water extends northwestward from the north end of North Marble Islet. Near the northern extremity of the shoal, 470 yards from the island, is a rock which bares 6 feet.

Leland Islands, the two islands lying about 1.5 miles eastward of the Marble Islets, are low, thickly wooded, and have an extensive area of shoal water surrounding them and a large reef to the southward. The channel between these islands and the Marble Islets is navigable but caution is necessary.

Beartrack Cove, which indents the eastern shore of Glacier Bay about 13 miles northward of Point Gustavus, is very deep throughout and the bottom slopes steeply from the shore. **Beartrack River,** a stream of considerable size, empties into the upper end of the cove. To anchor in 20 fathoms or less a vessel must lie about 175 yards off the low water line. Strong westerly winds bring swells into the cove.

A deep channel passes northward between the Leland Islands and the mainland, and then between North Marble Islet and Sturgess Islands. It affords good passage from Beartrack Cove to Sandy Cove and Muir Inlet.

Sturgess Islands, bare and higher than the Marble Islets, are 3 miles northward of North Marble Islet. The largest island has a longitudinal ridge which rises from the water with an even slope. A chain of islets extends southeastward from Sturgess Islands. A 5-fathom shoal is about 0.5 mile southwestward of Sturgess Islands. There are shoal areas in the western half of the strait between the Sturgess Islands and the large island to the eastward, but deep water is found if the eastern shore is favored.

Sandy Cove, between the mainland and the two islands about 1 mile eastward of the Sturgess Islands, affords anchorage in 5 to 10 fathoms, good holding ground and good protection from winds from any quarter. Ice rarely drifts into the cove. Two channels lead into North Sandy Cove; the north channel with 30 fathoms, is better because it is wide and deep. The south channel has a controlling depth of 4½ fathoms and is used to some extent by local fishing vessels and seal hunters.

Spokane Cove is 1 mile south of Sandy Cove. In entering care must be taken to pass southward of the rock off the northern shore and to avoid the boulders which fringe the shore of the mainland. The entrance channel has a depth of 10 fathoms. This cove is used by fishing boats with local knowledge but is open to winds from the northwest. Anchorage can be had in 5 to 8 fathoms, mud and sand bottom.

There are two rocks 0.5 mile off the southern entrance point. The southern one uncovers 12 feet and the northern one 2½ feet.

Muir Inlet extends northward for a distance of over 18 miles from the northern side of Glacier Bay. At its entrance the shores are steep and timbered but at the upper end of the inlet the shore is an area of terminal moraine with numerous shifting glacial streams. A number of glaciers empty into the inlet. Good depth is found in midchannel.

Muir Glacier, at the head of Muir Inlet, discharges bergs continuously as does Burroughs Glacier, and the presence of ice makes navigation precarious.

Tlingit Point, on the western side of the entrance, is rock outcrop. **Sebree Island,** close to the western shore, is heavily wooded, and is connected to the mainland by gravel and mud flats. Small vessels can anchor in **Sebree Cove,** between Tlingit Point and the southern part of Sebree Island; the holding ground is good. The cove is exposed to southerly winds but ice seldom drifts in.

Caroline Shoal, on the west side of Muir Inlet 2 miles above Tlingit Point, is a gravelly spit which is barely awash at high water. The northern side of the shoal is usually marked by grounded icebergs.

Garforth Island, 85 feet high and densely wooded except at the north end, is on the east side of Muir Inlet, about 2.8 miles northeastward of Sebree Island. The

channel between the island and the eastern shore of the inlet has a controlling depth of 6 fathoms. There is considerable kelp in the shoal part of the channel.

Adams Inlet, an indentation in the eastern shore of Muir Inlet, is deep at the entrance. It is reported dangerous to enter because of strong tidal currents and a large submerged rock near the center of its narrowest part, 2.7 miles from the entrance. **Adams Glacier,** which was at its head, has completely melted and ice no longer flows out of the inlet. Large bergs are frequently encountered in the inlet and it should not be entered without local knowledge.

Hunter Cove on the west side, 9 miles above the entrance, is a bight formed by the recession of **Plateau Glacier;** the cove is a good temporary anchorage. When using this bight care must be taken to avoid two rocks, which uncover 2 feet, close eastward of the bold point at the north entrance.

Wachusett Inlet is on the west side of Muir Inlet, about 6 miles northward of Adams Inlet, at the base of **Burroughs Glacier.** A shoal with a depth of 3¾ fathoms is near the middle of the entrance; icebergs frequently ground on this shoal. A reef, which uncovers 9 feet, is about in the middle of the inlet and about 500 yards from the southern shore. Vessels should favor the northern shore. Waves and surges, dangerous to small boats close to shore, are set up by the discharges of large masses of ice from Burroughs Glacier.

Sealers Island, a small rocky island with steep sides, is close to the eastern shore of Muir Inlet and about 6 miles northward of Adams Inlet. Small fishing vessels can anchor in **Goose Cove,** the small cove eastward of the island. The cove is narrow and shoal but generally free from ice during the summer.

The northwest arm of Glacier Bay has a northwesterly direction, with a width of 2 to 5 miles. **Lone Islet** has a rocky, precipitous shoreline and lies in midchannel about 3.4 miles northwestward of Drake Island. **Geikie Rock,** 6 feet high is off **Geikie Inlet,** 1.8 miles southward of Lone Islet. The grounded ice in the vicinity indicates a shoal of some extent. A large rock, which uncovers 11 feet, has been located 900 yards 042° from Geikie Rock.

Reconnaissance soundings have been made in Geikie Inlet and it is recommended that vessels navigating the inlet steer a midchannel course. **Hugh Miller Inlet** is shoal.

A line of soundings through Glacier Bay, favoring somewhat the north side, gave depths of 80 to 120 fathoms to **Composite Island,** which lies on the north side 13 miles northwestward of Lone Islet.

Johns Hopkins Inlet has a general southwesterly direction for 9 miles to **Johns Hopkins Glacier,** at the head. From the entrance of Johns Hopkins Inlet, it is about 10 miles to **Grand Pacific Glacier** at the head of **Tarr Inlet.** No sounding has been done. The north side of Glacier Bay, above Tlingit Point, is reported to be shoal to **Russell Island,** the large island 21 miles above the point.

Rendu Inlet, about 15 miles above Tlingit Point, has a north-northwesterly direction with depths of 75 to 100 fathoms.

Queen Inlet, 13 miles above Tlingit Point, has a northerly direction with depths of 40 to 75 fathoms. Mud flats are encountered eastward of **Triangle Island,** 3.5 miles above Composite Island. There are depths of 35 to 45 fathoms westward of Composite Island; no sounding has been done eastward of the island.

Chart 8304.—Port Frederick, on the south side of Icy Strait, between Crist Point and Point Sophia, has no known dangers other than those charted. It offers several very good anchorages with good holding ground and shelter.

Small craft approaching from westward use Gedney Channel. This channel is not recommended for large vessels on account of the unmarked dangers. Large vessels use midchannel courses between Point Sophia and Inner Point Sophia to eastward, and Pinta Rock and Halibut Rock to westward.

If bound for Hoonah, give Inner Point Sophia and the shore to eastward a berth of 200 yards or more. The approach is clear.

Crist Point, the western point at the entrance, is marked by two islands about 0.6 mile off its north side. **Hoonah Island,** the northwestern and larger one, is 270 feet high and wooded; a reef with 2 fathoms over it extends about 0.3 mile northward off the northwest end of Hoonah Island. **Scraggy Island,** 40 feet high and sparsely wooded, is about 0.8 mile southeast of Hoonah Island; a rock, which uncovers about 8 feet, is midway between Hoonah Island and Scraggy Island. **Pinta Rock,** awash at extreme minus tides and marked by kelp for about two-thirds of its length, is about 0.8 mile southeastward of Scraggy Island.

Gedney Channel lies southwestward of Hoonah and Scraggy Islands. Shoal spots are at the edge of the channel.

Halibut Island on the west side, 1 mile inside the entrance to the port, is wooded and foul ground extends 0.3 mile eastward from it. **Halibut Rock,** which uncovers, about 8 feet, is about 0.6 mile southward of Halibut Island. There is kelp for a distance of about 100 yards west and southwest of the rock, but none on its east side. A ½-fathom rock is midway between Halibut Island and the western shore.

Point Sophia shows from eastward as a wooded hill, somewhat bluff at the water's edge; southward of the hill is a V-shaped saddle, from which it rises to high land. From Point Sophia to Inner Point Sophia the shore is free of dangers.

Inner Point Sophia, on the east side of Port Frederick, 2 miles westward of Point Sophia, is similar in appearance to Point Sophia, but lower. **Inner Point Sophia Light (58°07.9′ N., 138°27.8′ W.),** 29 feet above the water and shown from a small white house on a skeleton tower, marks the entrance to Port Frederick. A cannery and wharf are a short distance inside of Inner Point Sophia.

The wharf is reported to have a face 54 feet in length with deep water alongside. A native village is located on the point.

Hoonah Point, 0.8 mile southward of Inner Point Sophia, is a rocky bluff, wooded on top. About 0.8 mile southward of Hoonah Point is **Pitt Island,** the northern one of several islands near the eastern shore. The island is wooded.

Hoonah Harbor is eastward of Hoonah Point and between Pitt Island and the northern shore. The anchorage is between, or a little inside, the western end of Pitt Island and the western end of the village, in 12 to 14 fathoms, soft bottom. The anchorage is not well protected from southwest, but the holding ground is good. Broad gravel beaches extend from the north side of Pitt Island and off the village. A bar, with about 1 fathom over it, connects the east end of Pitt Island with the main shore eastward.

Hoonah (pop. 686; P.O.) is a city on the northern shore of Hoonah Harbor. There are two general stores where provisions and fishermen supplies can be obtained. Gasoline and oils can be obtained from two oil companies which have wharves on the waterfront. The Standard Oil Company wharf, the northern wharf, has a least depth of 18 feet alongside its outer face. A float landing is on each side of the wharf. The Union Oil Company wharf, the southern wharf, has a depth of 18 feet off the northern corner, 14 feet off the center, and 9 feet off the southern corner. A float landing is on each side of the wharf. The municipal pier and float landing, about 135 yards northward of the Union Oil Company wharf is 200 feet long and has a reported depth of 12 feet alongside. A small grid is at each of the oil company wharves. A machine shop where minor repairs can be made is here. There is daily air and passenger service with Juneau and radio communication with Alaska Communication System.

Eastward of Hoonah is a small inlet, divided by a low wooded point. Mud flats, which uncover, and marsh grass fill the inlet. **False Point** is the low, wooded point southward of Pitt Island. **Long Island,** 0.6 mile southwestward of Pitt Island, is wooded, and connected with the eastern shore of the bay by flats on which there are islets and rocks. A small wooded island, with a reef extending about 0.2 mile off its western end, is between Pitt Island and Long Island, 0.2 mile northward of the latter.

Game Point, about 3 miles southward of Inner Point Sophia, is low and wooded. A narrow neck of land extends about 0.2 mile in a northeast direction from which flats stretch to Long Island. **Game Creek,** a large salmon creek, empties into the flats.

Humpback Creek empties into the northern end of a bight filled by flats on the western shore, about 2 miles southwestward of Game Point.

From Game Point the shore trends in a southwesterly direction for about 2.2 miles to a wooded point which extends about 0.3 mile in a northerly direction. In the inlet, eastward of the point, are depths of 12 fathoms at the entrance, shoaling to 2 fathoms near the head.

Burnt Point, 3.3 miles southwestward of Game Point, is wooded and rises rapidly to higher ground to the southeastward. **Grassy Rock,** a small grass-covered rock, is about 0.2 mile off Burnt Point. In the bight eastward of Grassy Rock are depths of 40 fathoms at the entrance to 13 fathoms near the head. Flats extend off the eastern side of the bight for 350 yards. **Seagull Creek,** about 1.8 miles southward of Burnt Point, has flats extending offshore 0.5 mile from its mouth.

Chimney Rock, about 0.5 mile off the southern point of the entrance to Neka Bay, is a small wooded islet. A reef extends from Chichagof Island shore almost to Chimney Rock, leaving a channel about 100 yards wide with a depth of ¾ fathom. There is a small islet on this reef.

Midway Island, small and wooded, is about 3.3 miles southward of Burnt Point. **Midway Rocks,** 0.5 mile west-northwestward of Midway Island, are two rocks, about 0.1 mile apart, which uncover 4 feet. A reef extends from the western shore, inside the rocks, for a distance of about 300 yards.

Anchorage may be had in 5 to 17 fathoms in a bight which indents the northern shore, about 3 miles westward of **The Narrows.**

The head of Port Frederick is divided into two inlets by a low, wooded, peninsula with rocks awash off its northeast end and extending to **Bell Island** which is low and wooded. Depths of 26 fathoms are found at the entrance to the northern inlet, shoaling to 11 fathoms near the head.

The southern inlet is long and narrow with several bends and has depths of 6 to 11 fathoms in the widest part, except near the shores. The channel to the two arms at the head of this inlet leads between the point and the rock and has depths of 5½ fathoms. Tide flats fill the northwestern arm, which extends to a canoe portage 70 yards wide to Tenakee Inlet. Depths of ½ fathom are found at its entrance. The southeastern arm has depths of 3 to 5 fathoms, sticky bottom.

Salt Lake Bay, at the southern end of Port Frederick, inside The Narrows, extends in a southerly direction, with depths of 47 fathoms at the entrance to 11 fathoms off the flats, which extend about 0.2 mile from the southeast corner. The bay then extends southwestward through an opening less than 150 yards wide and 0.2 mile long, with depths of 1 fathom, to a basin which has 12 fathoms in the middle.

Neka Bay, on the west side of Port Frederick about 9 miles from the entrance, extends in a westerly direction. It is divided into three arms by two low, wooded peninsulas. **Neka Island** is 0.2 mile eastward from the extremity of the northern peninsula. A sunken rock with 1 foot over it and unmarked is in midchannel southward of Neka Island.

From Neka Island, the north arm follows a west-northwesterly direction, narrowing to 0.3 mile; thence the arm follows a westerly direction, terminating in a large basin. The greater part of the basin is navigable at high water

for vessels of 2- or 3-foot draft; it dries at low water. On the southern side of the channel, 0.3 mile from the entrance to the narrow part, is a small wooded island with a bight to the southward. A depth of 2¾ fathoms was found in the southern channel leading to the bight; a rock is in the western channel.

North Bight, the middle arm of Neka Bay, with the entrance to the southward of Neka Island, has depths of 6 to 12 fathoms, sticky bottom. At the head it narrows to a small, irregularly shaped bight, shoal with the exception of a very narrow channel with depths of 3 to 6 fathoms.

The entrance to **South Bight** is constricted to a width of about 100 yards by a long narrow point which projects from the southern shore.

Chart 8302.—The Sisters, lying near the middle of Icy Strait, about 5 miles east-northeastward from Point Sophia, consist of two islands connected by a sand beach. The northern island is heavily wooded. The southern island is very narrow, with a clump of trees at each end, giving the group the appearance of three islands. There is a 1¼-fathom spot, 0.4 mile southeastward from the southeast end of the southern island.

The Sisters Light (58°10.7′ N., 135°15.4′ W.), 25 feet above the water, is shown from a small white house on the north end of the northern island. An aero light and radiobeacon are on the south end of this island.

Sisters Reef, 1.1 miles westward of the north end of The Sisters, uncovers two heads and has no kelp. At times the tidal current has a velocity of 2 or 3 knots over the reef.

Spasski Island, marked by a light on its northern side, is 2 miles southward of The Sisters. The island is small and divided at high water; the larger part has several trees on it. A reef, showing well in places at low water, extends 0.4 mile southward from it. A detached bare rock is about 0.6 mile southeastward of the island. Shoal spots exist on the following distances and bearings from the light: 0.7 mile 301°, 5¼ fathoms; 0.5 mile 277°, 1¾ fathoms; 0.8 mile 134°, 5¼ fathoms.

Spasski Bay is on the south shore to the southward of Spasski Island. **Neck Point,** the western point at the entrance, is a high, rocky, wooded peninsula, connected with the main shore by a low narrow neck. It is reported that the cannery tender EXCURSION struck a sunken rock about 700 yards northward from Neck Point. In the eastern end of the bay are extensive sand flats, and behind the low point is a grassy flat covered at high water. **Pulizzi Island,** a small triangular-shaped, wooded island, with rocks 0.1 mile off the northeast end, lies off the eastern end of the bay. The shores of the bight at the western end of the bay are wide sand and gravel beaches, with a flat covered at high water near the eastern point of the bight.

The anchorage, exposed to the northeast, is in 9 to 10 fathoms in the middle of the western end of the bay, with Neck Point bearing northeast.

The shore eastward of Point Sophia and the reef northwestward of Neck Point should be given a berth of 0.8 mile.

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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., and its district offices and sales agents which are listed semiannually in the Notice to Mariners.

District Office.—Seattle District, Room 705, Federal Office Building, Seattle 4, Wash. The State of Alaska is in the Seattle District.

United States Coast Pilots:

1, Atlantic Coast, Eastport to Cape Cod, 1960.
2, Atlantic Coast, Cape Cod to Sandy Hook, 1960.
3, Atlantic Coast, Sandy Hook to Cape Henry, 1961.
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, Pacific Coast, Alaska, Dixon Entrance to Cape Spencer, 1962.
9, Alaska, Cape Spencer to Arctic Ocean, 1954.
Distances between United States Ports, 1961.

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 (1960).
San Francisco Bay (1947).
Puget Sound, Northern Part (1952).
Puget Sound, Southern Part (1961).

Coast and Geodetic Survey Sales Agents.—Agents marked with an asterisk (*) also handle certain U.S. Navy Hydrographic Office publications; those marked with a dagger (†) also handle certain U.S. Coast Guard publications, and those marked with a double dagger (‡) also handle the Canadian Hydrographic Service publications:

Washington:

Anacortes: † Marine Supply and Hardware; † Transmission Supply, 902 Commercial St.
Bellingham: †‡ Griggs, Stationers & Printers, 120 E. Holly St.; Ira Yeager's Marina, 3101 Northwest Ave.
Bremerton: Bremerton Marine Supply, Inc., 851 Sixth St.
Everett: ‡ Black and King, 2944 Colby Ave.; Robinson Marina, 19th & Norton St.
Friday Harbor: †‡ Friday Harbor Drug Co.
Hoquiam: Industrial & Marine Supply Co., 701 Levee St.
Kelso: Cowlitz Marina, 85 Catlin
Neah Bay: ‡ Washburns General Merchandise.
Oak Harbor: Chuck Dann's Sporting Goods, Inc., 1150 W. Pioneer Way.
Olympia: Capital Towing & Marina, Columbia & B St.
Port Angeles: †‡ Willson Hardware Co., 111 W. First St.
Seattle: Coast & Geodetic Survey District Office, 705 Federal Office Building; †*‡ Max Kuner Co., 1324 Second Ave.; †*‡ Metsker Maps, 1020 Third Ave.; †*‡ Northwest Instrument Co., Inc., 1403 West 45th St.; †*‡ Shrock, The Compass Adjuster, Fishermans Dock and 1117 E. Northlake Ave.
Tacoma: †*‡ Metsker Maps, 111 South 10th St.

British Columbia:

Prince Rupert: ‡ Prince Rupert Fishermen's Supply Co., Ltd.
Vancouver: †*‡Bovey Marine 1952, 1117 W. Pender St.; *‡ Frederick Goertz Ltd., 1328 W. Pender St.; ‡ Sounder Sales & Service, Ltd., 752 E. Hastings St.; *‡ Western Marine Supply Co., Ltd., 528 Powell St.
Victoria: *‡ Ship Chandlers (McQuades), Ltd., 1252 Wharf St.

Alaska:

Anchorage: Miller-Dalton Co.
Cordova: Cordova Drug Co.
Craig: J. T. Brown's Store.
Homer: The Sporter Arms Co.
Juneau: † J. B. Burford Inc.; † Northern Commercial Co.
Ketchikan: †*‡ Service Electric Co., Inc., 744 Water St.
Kodiak: † Donnelly and Acheson.
Pelican: Pelican Cold Storage Co.
Petersburg: The Trading Union, Inc.
Port Protection: B.S. Trading Post.
Sand Point: Aleutian Cold Storage Co.
Seldovia: H. S. Young Merchantile Co.
Seward: Durant's Hardware, Box 737.
Sitka: Sitka Arts & Crafts.
Tenakee Springs: Snyder Mercantile Co.
Valdez: Valdez Drug Co., Inc.

Wrangell: Campbell & Hay, Inc.
Yakutat: Mallott's General Store.

PUBLICATIONS.—A résumé 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 (Atlantic Coast), and Part II (Pacific Coast)—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 its sales agents.

Radio.—Radio Navigational Aids (H.O. Pub. No. 117, formerly No. 205); Radio Weather Aids (H.O. Pub. No. 118, formerly No. 206); Weather Station Index (H.O. Pub. No. 119, formerly No. 207); and International Code of Signals, Volume II—Radio (H.O. Pub. No. 104, formerly 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. Pub. No. 9), and International Code of Signals, Volume I—Visual (H.O. Pub. No. 103, formerly 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: Part I (port administration and services) published by Maritime Administration. U.S. Department of Commerce; Part II (port conditions and facilities) published by Corps of Engineers, U.S. Army. Both parts are for sale by the Superintendent of Documents.

CORPS OF ENGINEERS, U.S. ARMY.—The Alaska District consists of the State of Alaska. District Office: Anchorage, Alaska.

COAST GUARD.—Commander, 17th Coast Guard District, Community Building, P.O. Box 2631, Juneau, Alaska. Coverage: Alaska.

Captain of the Port, U.S. Coast Guard Base, Ketchikan, Alaska. All navigable waters and contiguous land areas in the southern part of Alaska northward of the United States-Canadian boundary to the 56° N. parallel.

CUSTOMS DISTRICT.—The first port listed in the district is the headquarters port. An asterisk (*) precedes the names of ports authorized to issue documents:

Alaska District: The limits are the State of Alaska.

Ports of entry: * Juneau, Anchorage, Cordova, * Ketchikan, Pelican, Petersburg, Sand Point, * Sitka, Skagway, * Wrangell, and Kodiak.

PUBLIC HEALTH SERVICE.—Quarantine Stations where supervision of quarantine and medical examination of aliens are performed:

Anchorage: Anchorage International Airport. Contract offices are at Juneau, Ketchikan, Seward, and Whittier.

Hospitals: There are no Public Health Service hospitals in Alaska; the nearest is at Seattle, Wash.

Outpatient offices: Juneau, Franklin St. & 2nd Ave.; Nome, Maynard-MacDougall Memorial Hospital; Ketchikan, Koel Bldg., 325 Dock St.; Seward, Seward General Hospital; Cordova; and Petersburg.

IMMIGRATION and **NATURALIZATION.**—Offices of these services are in the following places in Alaska:

District Office: Anchorage, 545 E. 4th St. Suboffices: Haines; Juneau, Federal Office Bldg; Ketchikan, 208 Federal Office Bldg., Mission and Stedman Sts.; Skagway.

FEDERAL COMMUNICATIONS COMMISSION.—District field offices:

Anchorage: U.S. Post Office and Courthouse.

Juneau: Shattuck Bldg.

WEATHER BUREAU.—Barometers may be compared with standards at the following offices:

Anchorage: Anchorage International Airport.

Juneau: Juneau Airport.

Radiotelephone broadcasts by Coast Guard.—Scheduled marine information broadcasts of notices to mariners, hydrographic information, storm warnings, small craft warnings, advisories, and other important marine information are broadcast by radiotelephone at the scheduled times (local standard) and indicated frequencies preceded by an initial call on 2182 kc. Safety and urgent broadcasts are made on 2182 kc. upon receipt.

NMJ, Ketchikan, 2670 kc., 6:30 a.m., 10 a.m., and 10 p.m.

NOJ, Kodiak, 2670 kc., 9 a.m. and 9 p.m.

Radiotelegraph broadcasts by Coast Guard.—Scheduled marine information broadcasts of notices to mariners, hydrographic information, storm warnings, advisories, and other important information are broadcast by radiotelegraph at the scheduled times (local standard) and indicated frequencies, preceded by an initial call on 500 kc. Urgent broadcasts are made on 500 kc. upon receipt and repeated during the last 15 seconds of the first silent period after receipt. Urgent broadcasts are preceded by the Urgent Signal (XXX).

NMJ, Ketchikan, 466 kc., 9:30 a.m. and 9:30 p.m.

Radiotelephone broadcasts of weather information.—Regular broadcasts of weather forecasts, storm warnings, and other information are made on local standard time in plain language by the following radiotelephone stations:

ALB, Anchorage, 2312 kc., 8 a.m. and 7 p.m. daily.

ALB66, Cold Bay, 2312 kc., 10 a.m., 1 and 4 p.m. daily (seasonal).

ALB44, Cordova, 2300 kc., odd hours, 9 a.m. to 5 p.m. weekdays; odd hours, 11 a.m. to 1 p.m. Sundays and holidays in summer.

ALF, Juneau, 2784 kc., 6:30 and 8:30 a.m., 1, 6:30, and 8:30 p.m. daily.

ALE, Ketchikan, 2300 kc., 10:15 a.m., 4:15 and 10:15 p.m. daily.

ALB77, King Salmon, 2312 kc., 8:30 a.m., 2:30 and 7 p.m. daily (seasonal).

ALB99, Kodiak, 2784 kc., odd half-hour, 9 a.m. to 6 p.m. weekdays.

ALF44, Sitka, 2312 kc., 11 a.m., 2 and 5 p.m. weekdays.

ALD33, Unalaska, 2312 kc., 9 a.m. weekdays; 8 a.m. and 12 noon Saturdays.

Weather broadcasts by commercial radio stations.—Taped or direct broadcasts of forecasts and storm warnings are made by commercial radio stations in the areas covered by this Coast Pilot. These usually are put on the air at least twice daily; broadcast times are published in local newspaper radio program schedules, and in the Coastal Warning Facilities Charts issued annually by the U.S. Weather Bureau. The charts are on sale, 10 cents each, by Superintendent of Documents, Washington 25, D.C.

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.

ANNETTE, ALASKA (Annette Airport) 55°02' N., 131°34' W.; Elevation (ground) 110 feet. WB-1960

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): 4:00 p.m. PST	10:00 p.m. PST	Wind (knots): Mean speed	Prevailing direction	Fastest mile 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)				13	13		13	13	13	13	12	12	10		13	13	13	13	13	13	13	13
Jan.	38.6	30.5	34.6	60	2	9.40	4.01	12.7	75	77	12.0	ESE	50 SSE		7.7	5	3	23	19	4	*	*
Feb.	40.7	31.4	36.1	55	2	7.30	3.50	11.7	74	80	12.0	SE	43 SSE		8.0	4	4	20	19	3	0	*
Mar.	43.2	32.9	38.1	58	1	8.68	3.66	11.0	70	80	10.9	SE	41 SSE		7.8	5	4	22	20	3	0	1
Apr.	48.6	36.6	42.6	73	21	8.13	4.75	1.3	67	79	10.9	SE	52 SE		7.7	4	6	20	17	*	0	
May	55.6	42.4	49.0	80	32	4.49	4.29	T	68	82	8.9	SSE	38 SE		7.9	4	5	22	17	0	0	2
June	60.8	47.7	54.3	89	39	4.69	2.74	0.0	70	83	8.7	SSE	38 SSE		8.1	3	6	21	15	0	*	2
July	62.5	51.0	56.8	86	44	5.59	2.40	0.0	73	86	7.6	SSE	30 SSE		8.0	3	6	22	14	0	*	3
Aug.	64.1	51.8	58.0	90	41	5.26	4.68	0.0	74	87	8.0	SSE	35 SSE		7.8	4	6	21	14	0	*	3
Sep.	58.6	47.6	53.1	77	37	9.60	5.04	0.0	76	88	8.9	SE	43 SE		7.7	4	6	20	17	0	*	4
Oct.	51.2	42.6	46.9	63	29	14.38	7.59	0.3	80	85	11.6	SE	48 SSE		8.7	2	4	25	24		*	2
Nov.	44.8	36.6	40.7	63	12	10.22	5.19	2.9	80	82	12.5	SE	44 SSE		8.5	3	3	24	23	2	*	1
Dec.	40.3	31.9	36.1	57	2	9.11	5.20	9.2	80	81	12.7	ESE	50 SSE		8.6	2	4	25	23	3	*	*
Year	50.8	40.3	45.6	90	1	96.85	7.59	49.1	74	83	10.3	SE	52 SE		8.0	43	57	265	221	16	2	18

PETERSBURG, ALASKA (Weather Bureau) 56°49' N., 132°57' W. Elevation (ground) 100 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)		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)	21	21	21	21	21	21	21	21				19							21			
Jan.	34.0	23.1	28.6	55	-19	9.73	3.77	28.5				SW							20			
Feb.	36.2	24.4	30.3	64	- 7	7.09	4.42	22.5				SW							17			
Mar.	41.4	28.1	34.8	59	0	7.18	3.16	11.9				SW							19			
Apr.	48.7	32.8	40.8	72	10	6.98	2.54	0.9				SE							19			
May	56.7	38.8	47.8	78	27	5.60	2.83	T				SE							17			
June	62.2	44.8	53.5	81	29	4.71	2.35	0.0				E							15			
July	63.5	47.9	55.7	84	37	5.44	2.86	0.0				E							17			
Aug.	63.4	47.0	55.2	79	32	7.49	3.55	0.0				E							16			
Sep.	58.1	43.7	50.9	81	26	11.48	4.49	0.0				E							19			
Oct.	49.8	38.1	43.9	72	19	16.97	5.70	0.7				SW							23			
Nov.	41.1	30.7	35.9	63	4	12.31	3.64	10.1				SW							22			
Dec.	35.8	26.3	31.1	59	- 9	10.10	3.24	22.0				SW							22			
Year	49.2	35.5	42.4	84	-19	105.08	5.70	96.6				SW							226			

JUNEAU, ALASKA (Juneau Airport) 58°22'N., 134°35'W. Elevation (ground) 17 feet. WB-1960

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): 4:00 p.m. PST	10:00 p.m. PST	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)				17	17		17	17	17	17	17	17	15	15	17	17	17	17	17	17	17	17
Jan.	31.2	21.1	26.2	57	-19	4.48	2.74	17.9	77	80	7.3	N	59 SE	29	7.9	5	2	24	18	6	0	2
Feb.	32.7	21.9	27.3	48	-12	3.46	2.37	18.9	73	80	7.3	ESE	57 SE	32	8.0	4	3	21	17	5	0	2
Mar.	38.5	27.0	32.8	52	-11	3.47	1.81	15.7	68	80	7.7	E	43 SE	37	7.9	5	3	23	18	4	0	2
Apr.	46.7	32.3	39.5	71	7	2.98	1.57	4.1	63	80	7.6	ESE	50 SE	37	8.1	3	4	23	17	1	0	1
May	55.7	38.3	47.0	82	25	3.19	1.39	T	61	79	6.9	ESE	41 SE	34	7.8	4	4	23	17	0	0	1
June	62.8	44.3	53.6	84	31	3.18	1.92	0.0	60	75	6.7	N	39 SE	34	7.8	4	4	22	15	0	*	*
July	62.4	47.0	54.7	84	36	4.65	1.67	0.0	68	79	6.6	N	28 SE	27	8.3	2	5	24	17	0	*	*
Aug.	62.3	46.0	54.2	83	27	5.16	2.38	0.0	71	83	6.5	N	29 SE	30	8.0	4	4	23	18	0	0	1
Sep.	55.6	42.3	49.0	72	26	6.92	3.17	T	75	88	6.8	N	42 SE	24	8.5	3	3	24	20	0	*	3
Oct.	47.2	36.6	41.9	61	16	8.47	4.66	1.3	79	87	8.0	ESE	53 SE	17	8.7	3	2	26	23	*	0	3
Nov.	37.7	28.5	33.1	56	-3	5.92	3.34	10.5	82	85	7.6	ESE	51 SE	21	8.5	3	2	25	21	4	0	3
Dec.	32.1	23.0	27.6	54	-21	4.17	3.56	22.1	81	83	8.0	ESE	43 SE	18	8.5	3	2	26	22	6	0	2
Year	47.1	34.0	40.6	84	-21	56.05	4.66	90.5	72	82	7.3	N	59 SE	30	8.2	43	38	284	223	26	*	21

HAINES, ALASKA (Weather Bureau) 59°14'N., 135°26' W. Elevation (ground) 100 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):		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)	28	28	28	28	28	28	28	27				27							27			
Jan.	29.1	17.3	23.2	54	-15	6.61	3.62	34.8				W							16			
Feb.	31.1	19.7	25.4	53	-16	4.10	2.95	21.9				W							13			
Mar.	37.6	25.5	31.6	63	-6	4.75	2.63	17.9				W							15			
Apr.	46.7	31.8	39.3	70	6	3.40	2.72	3.0				SE							14			
May	56.8	39.9	48.4	83	26	2.12	1.62	0.4				SE							11			
June	64.3	46.2	55.3	88	30	1.43	2.07	0.0				SE							8			
July	65.5	49.7	57.6	90	35	1.94	2.10	0.0				SE							11			
Aug.	63.9	48.2	56.1	86	32	2.75	2.75	0.0				SE							11			
Sep.	57.0	43.4	50.2	76	24	6.38	3.60	T				SSE							25			
Oct.	46.4	35.9	41.2	65	8	11.63	5.64	4.0				SE							20			
Nov.	36.2	26.3	31.3	58	-11	8.60	3.92	19.9				W							18			
Dec.	30.1	19.8	25.0	57	-14	6.93	3.68	30.7				W							17			
Year	47.1	33.6	40.4	90	-16	60.64	5.64	132.6				SE							179			

HOURS OF OPERATION OF FOG SIGNALS
(U.S. Coast Guard)

Light station	11 Calendar Years - 1950 thru 1960														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				
Tree Point 58°48.2'N., 130°55.9'W.	37	56	49	14	17	35	56	70	69	58	24	38	523	976	263	45	710
Mary Island 55°06.0'N., 131°10.8'W.	113	105	100	57	53	50	91	114	105	125	91	134	1138	2021	246	46	895
Guard Islands 55°26.8'N., 131°52.8'W.	112	104	84	43	37	18	52	82	98	115	100	98	943	2914	198	44	744
Lincoln Rock 56°03.4'N., 132°41.8'W.	143	105	120	57	41	32	52	75	93	114	101	127	1060	1659	187	45	651
Cape Decision 56°00.1'N., 134°08.1'W.	62	85	61	47	72	76	138	138	114	82	87	91	1053	2605	607	18	1150
Five Finger 57°16.3'N., 133°37.8'W.	84	73	48	16	14	21	30	42	42	37	55	59	521	1005	358	46	751
Point Retreat 58°24.7'N., 134°57.2'W.	102	104	96	38	10	9	29	34	40	33	48	96	639	1064	309	26	665
Sentinel Island 58°32.8'N., 134°55.3'W.	163	173	144	43	25	14	52	76	95	92	122	177	1176	2267	423	47	975
Eldred Rock 58°58.3'N., 135°13.2'W.	101	133	121	37	11	4	15	23	31	45	75	116	712	1099	443	43	916
Cape Spencer 58°11.9'N., 136°38.3'W.	106	109	107	53	47	113	183	144	104	69	100	107	1242	2312	671	23	1059
Cape St. Elias 59°47.8'N., 144°36.3'W.	99	96	76	72	84	71	97	107	99	71	85	89	1046	1668	511	32	2103
Cape Hinchinbrook 60°14.3'N., 146°38.8'W.	67	80	89	51	40	62	101	96	58	46	40	68	798	1180	660	38	1521
Scotch Cap * 54°23.8'N., 164°44.6'W.	120	143	153	136	109	150	261	251	171	86	85	70	1735	2808	1085	20	1715
Cape Sarichef 54°36.0'N., 164°55.7'W.	35	45	38	48	48	115	207	199	59	25	20	34	873	1776	442	19	981

* 10 Calendar Years - 1951 thru 1960

MEAN SURFACE WATER TEMPERATURES AND SALINITIES

Station	Years	Jan.		Feb.		Mar.		Apr.		May		June		July		Aug.		Sept.		Oct.		Nov.		Dec.		Mean	
		Temp. °F	Sal. ‰	Temp. °F	Sal. ‰	Temp. °F	Sal. ‰	Temp. °F	Sal. ‰	Temp. °F	Sal. ‰	Temp. °F	Sal. ‰	Temp. °F	Sal. ‰	Temp. °F	Sal. ‰	Temp. °F	Sal. ‰	Temp. °F	Sal. ‰	Temp. °F	Sal. ‰	Temp. °F	Sal. ‰	Temp. °F	Sal. ‰
Ketchikan	39	41.3	28.5	41.0	29.3	41.7	29.5	43.6	29.3	48.3	27.8	54.3	26.0	56.9	25.4	57.2	25.1	53.9	25.6	49.0	25.2	44.8	25.1	42.4	26.8	47.9	27.0
Sitka	19	40.4	30.2	39.7	30.7	39.9	30.3	42.5	29.8	47.8	26.7	52.3	25.1	56.1	24.8	57.1	25.5	53.8	25.6	48.7	27.2	44.7	28.1	42.2	29.1	47.1	27.8
Juneau	24	36.2	28.4	35.8	29.3	37.1	29.5	40.1	27.8	45.7	19.3	50.7	14.2	51.6	12.6	51.1	13.6	48.5	15.6	43.8	19.1	40.3	23.7	37.8	27.1	43.2	21.7
Haines	2	34.6	30.7	30.4	30.8	37.2	31.4	39.8	30.3	47.8	27.1	54.6	18.4	55.0	9.4	54.8	8.0	51.0	10.6	44.2	23.9	38.1	28.2	35.2	30.1	43.6	23.2
Skagway	17	36.6	31.0	36.1	31.4	36.3	31.4	38.0	31.1	44.9	22.5	50.7	9.9	51.1	5.4	50.0	4.8	48.0	11.2	43.7	21.4	39.9	27.7	37.8	29.8	42.8	21.5
Yakutat	20	38.9	29.9	38.4	30.2	39.0	30.1	41.8	29.5	46.4	28.1	51.7	26.1	55.4	23.5	55.4	23.5	52.3	25.4	47.8	27.5	43.8	28.8	40.6	29.5	46.0	27.7

For sea water temperature and salinity data in greater detail, see Coast and Geodetic Survey Publication 31-3, Surface Water Temperature and Salinities, Pacific Coast, North and South America and Pacific Ocean islands.

Table 27

DISTANCES IN STRAIT OF JUAN DE FUCA AND STRAIT OF GEORGIA

CAPE FLATTERY, WASH., TO SEATTLE, WASH., AND VANCOUVER, CANADA

February 21, 1959

Figure at intersection of columns opposite ports in question is the nautical mileage between the two. Example: Port Angeles, Wash., is 69 nautical miles from Seattle, Wash.

	CAPE FLATTERY, WASH. 48°26.0'N., 124°47.0'W.	SWIFTSURE BANK, WASH. 48°31.0'N., 125°00.0'W.	Neah Bay, Wash. 48°22.4'N., 124°36.5'W.	Port Angeles, Wash. 48°07.5'N., 123°26.4'W.	Victoria, Canada 48°25.0'N., 123°23.5'W.	Port Townsend, Wash. 48°06.8'N., 122°45.2'W.	Port Ludlow, Wash. 47°55.3'N., 122°41.0'W.	Port Gamble, Wash. 47°51.3'N., 122°34.7'W.	Everett, Wash. 47°59.3'N., 122°13.2'W.	Point Wells, Wash. 47°47.1'N., 122°23.7'W.	Seattle, Wash. 47°36.2'N., 122°20.3'W.	Eagle Harbor, Wash. 47°37.2'N., 122°30.7'W.	Bremerton, Wash. 47°33.5'N., 122°38.0'W.	Tacoma, Wash. 47°16.0'N., 122°26.0'W.	Olympia, Wash. 47°03.1'N., 122°54.3'W.	Roche Harbor, Wash. 48°36.6'N., 123°09.1'W.	Friday Harbor, Wash. 48°32.2'N., 123°00.9'W.	Anacortes, Wash. 48°31.4'N., 122°36.7'W.	Bellingham, Wash. 48°45.1'N., 122°29.0'W.	Blaine, Wash. 48°59.5'N., 122°45.9'W.	Nanaimo, Canada 49°10.1'N., 123°56.0'W.	New Westminster, Canada 49°12.0'N., 122°54.5'W.	Vancouver, Canada 49°17.4'N., 123°06.6'W.
10																							
10	20																						
61	71	54																					
62	71	55	19																				
86	96	79	32	34																			
100	110	93	46	48	16																		
104	114	97	50	53	21	10																	
117	127	110	63	66	34	26	28																
111	121	103	56	59	27	19	21	16															
124	134	116	69	72	40	32	34	30	14														
123	133	115	68	71	40	32	34	29	14	8													
131	141	124	77	80	48	40	42	38	23	14	13												
143	153	136	89	91	59	52	53	49	34	25	25	29											
168	178	160	113	115	84	75	78	73	59	50	50	50	34										
83	92	76	36	25	41	54	58	71	64	77	76	85	96	121									
87	96	80	37	30	30	44	48	62	54	67	67	76	86	112	12								
93	102	86	42	36	30	43	47	49	54	66	66	74	86	110	27	18							
108	117	101	54	50	43	57	61	63	68	80	80	88	100	124	37	28	17						
112	121	105	65	55	59	72	76	80	83	95	95	104	115	139	35	37	36	38					
145	154	138	99	89	97	111	115	118	121	134	134	142	154	177	66	69	76	75	55				
139	148	132	93	82	91	105	109	114	116	128	128	137	148	171	60	60	70	71	48	48			
141	150	133	95	83	92	106	110	115	117	129	129	138	149	173	62	62	71	72	48	36	41		

Table 29

ALASKA DISTANCES

July 1, 1961

Figure at intersection of columns opposite ports in question is the nautical mileage between the two. Example: Anchorage is 383 nautical miles from Valdez.

	SWIFTSURE BANK 48°31.0'N., 125°00.0'W.	DIXON ENTRANCE 54°28.0'N., 132°52.0'W.	CAPE DECISION 55°59.4'N., 134°08.1'W.	Sitka 57°03.1'N., 135°20.5'W.	CAPE SPENCER 58°10.0'N., 136°38.3'W.	Yakutat 59°32.9'N., 139°43.9'W.	Cordova 60°33.4'N., 145°45.3'W.	Valdez 61°06.7'N., 146°16.3'W.	Whittier 60°46.8'N., 148°39.6'W.	Latouche 60°03.3'N., 147°54.1'W.	Seward 60°06.0'N., 149°26.3'W.	Seldovia 59°26.5'N., 151°43.0'W.	Anchorage 61°14.2'N., 149°53.3'W.	Kodiak 57°47.1'N., 152°25.1'W.	Uyak 57°38.6'N., 154°00.0'W.	Chignik 56°17.8'N., 158°24.0'W.	Unga 55°10.6'N., 160°29.8'W.	False Pass 54°51.4'N., 163°24.0'W.	UNIMAK PASS 54°20.0'N., 164°45.0'W.	Dutch Harbor 53°52.7'N., 166°31.8'W.	Kuluk Bay 51°51.6'N., 176°37.6'W.	Kiska 51°58.3'N., 177°34.5'E.	Alcan Harbor 52°43.8'N., 174°04.1'E.	Massacre Bay 52°48.9'N., 173°15.6'E.	St. Paul Island 57°07.6'N., 170°17.9'W.	St. Michael 63°32.4'N., 161°54.8'W.	Nome 64°29.0'N., 165°26.0'W.	Barrow 71°18.0'N., 156°48.0'W.	Barter Island 70°09.0'N., 143°40.0'W.
SWIFTSURE BANK 48°31.0'N., 125°00.0'W.																													
DIXON ENTRANCE 54°28.0'N., 132°52.0'W.	500																												
CAPE DECISION 55°59.4'N., 134°08.1'W.	588	106																											
Sitka 57°03.1'N., 135°20.5'W.	681	192	95																										
CAPE SPENCER 58°10.0'N., 136°38.3'W.	739	259	162	85																									
Yakutat 59°32.9'N., 139°43.9'W.	869	402	295	231	141																								
Cordova 60°33.4'N., 145°45.3'W.	1087	621	527	465	387	274																							
Valdez 61°06.7'N., 146°16.3'W.	1100	634	539	478	400	287	77																						
Whittier 60°46.8'N., 148°39.6'W.	1107	642	547	485	407	295	99	92																					
Latouche 60°03.3'N., 147°54.1'W.	1076	617	527	467	395	286	86	84	64																				
Seward 60°06.0'N., 149°26.3'W.	1100	642	553	494	422	312	147	145	125	61																			
Seldovia 59°26.5'N., 151°43.0'W.	1167	718	636	580	514	411	258	256	236	172	147																		
Anchorage 61°14.2'N., 149°53.3'W.	1294	845	763	708	641	538	385	383	363	300	274	139																	
Kodiak 57°47.1'N., 152°25.1'W.	1124	687	613	564	505	414	287	285	265	201	175	115	242																
Uyak 57°38.6'N., 154°00.0'W.	1200	762	689	628	571	480	340	337	317	254	228	138	264	80															
Chignik 56°17.8'N., 158°24.0'W.	1301	874	811	772	717	636	503	501	481	418	392	302	428	245	180														
Unga 55°10.6'N., 160°29.8'W.	1394	953	892	865	811	730	597	595	574	511	485	395	521	338	273	122													
False Pass 54°51.4'N., 163°24.0'W.	1473	1084	1016	980	926	844	711	709	689	626	600	510	636	453	388	236	135												
UNIMAK PASS 54°20.0'N., 164°45.0'W.	1510	1120	1064	1027	987	897	763	761	742	678	652	562	688	505	440	289	187	86											
Dutch Harbor 53°52.7'N., 166°31.8'W.	1585	1195	1139	1102	1062	972	838	836	817	753	727	637	763	580	515	364	262	161	75										
Kuluk Bay 51°51.6'N., 176°37.6'W.	1973	1583	1527	1490	1450	1360	1226	1224	1205	1141	1115	1025	1151	968	903	752	650	549	463	407									
Kiska 51°58.3'N., 177°34.5'E.	2182	1792	1736	1699	1659	1569	1435	1433	1414	1350	1324	1234	1360	1177	1112	961	859	758	672	616	235								
Alcan Harbor 52°43.8'N., 174°04.1'E.	2315	1925	1869	1832	1792	1702	1568	1566	1547	1483	1457	1367	1493	1310	1245	1094	992	891	805	749	368	157							
Massacre Bay 52°48.9'N., 173°15.6'E.	2343	1953	1897	1860	1820	1730	1596	1594	1575	1511	1485	1395	1521	1338	1273	1122	1020	919	833	777	396	185	33						
St. Paul Island 57°07.6'N., 170°17.9'W.	1764	1374	1318	1281	1241	1151	1017	1015	996	932	906	816	942	759	694	543	441	340	254	239	387	526	604	632					
St. Michael 63°32.4'N., 161°54.8'W.	2221	1831	1775	1738	1698	1608	1474	1472	1453	1389	1363	1273	1399	1216	1151	1000	898	797	711	724	900	984	1017	1040	529				
Nome 64°29.0'N., 165°26.0'W.	2156	1766	1710	1673	1633	1543	1409	1407	1388	1324	1298	1208	1334	1151	1086	935	833	732	646	659	835	919	952	975	470	110			
Barrow 71°18.0'N., 156°48.0'W.	2665	2275	2219	2182	2142	2052	1918	1916	1897	1833	1807	1717	1843	1660	1595	1444	1342	1241	1155	1167	1343	1427	1460	1483	982	672	566		
Barter Island 70°09.0'N., 143°40.0'W.	2938	2548	2492	2455	2415	2325	2191	2189	2170	2106	2080	1990	2116	1933	1868	1717	1615	1514	1428	1440	1616	1700	1733	1756	1255	945	839	274	

Table 30

INSIDE - PASSAGE DISTANCES

Seattle, Wash. to Cape Spencer, Alaska

July 1, 1961

Figure at intersection of columns opposite ports in question is the nautical mileage between the two. Example: Ketchikan, Alaska, is 220 nautical miles from Juneau, Alaska.

	Seattle, Wash. 47°36.2'N., 122°20.3'W.	Victoria, Canada 48°25.0'N., 123°23.5'W.	DIXON ENTRANCE, ALASKA 54°28.0'N., 132°52.0'W.	Hyder, Alaska 55°54.2'N., 130°00.6'W.	Cape Chacon, Alaska 54°40.6'N., 131°59.7'W.	Metlakatla, Alaska 55°07.8'N., 131°34.2'W.	Ketchikan, Alaska 55°20.5'N., 131°38.7'W.	Craig, Alaska 55°28.7'N., 133°09.2'W.	Wrangell, Alaska 56°28.2'N., 132°23.2'W.	CAPE DECISION, ALASKA 55°59.4'N., 134°08.1'W.	Port Alexander, Alaska 56°14.8'N., 134°38.8'W.	Petersburg, Alaska 56°48.9'N., 132°57.8'W.	Sitka, Alaska 57°03.1'N., 135°20.5'W.	Pelican, Alaska 57°57.6'N., 136°13.8'W.	Juneau, Alaska 58°17.9'N., 134°24.7'W.	Haines, Alaska 59°13.8'N., 135°26.1'W.	Skagway, Alaska 59°26.8'N., 135°19.3'W.	Gustavus, Alaska 58°23.3'N., 135°43.6'W.	CAPE SPENCER, ALASKA 58°10.0'N., 136°38.3'W.
Seattle, Wash. 47°36.2'N., 122°20.3'W.																			
Victoria, Canada 48°25.0'N., 123°23.5'W.	72																		
DIXON ENTRANCE, ALASKA 54°28.0'N., 132°52.0'W.	664	612																	
Hyder, Alaska 55°54.2'N., 130°00.6'W.	690	638	169																
Cape Chacon, Alaska 54°40.6'N., 131°59.7'W.	640	588	34	136															
Metlakatla, Alaska 55°07.8'N., 131°34.2'W.	660	608	66	148	32														
Ketchikan, Alaska 55°20.5'N., 131°38.7'W.	659	608	79	144	45	16													
Craig, Alaska 55°28.7'N., 133°09.2'W.	716	664	77	212	76	109	121												
Wrangell, Alaska 56°28.2'N., 132°23.2'W.	749	697	157	234	123	104	89	111											
CAPE DECISION, ALASKA 55°59.4'N., 134°08.1'W.	788	737	126	273	125	143	129	49	75										
Port Alexander, Alaska 56°14.8'N., 134°38.8'W.	812	761	150	297	149	167	153	73	99	24									
Petersburg, Alaska 56°48.9'N., 132°57.8'W.	771	719	180	256	146	126	112	113	40	76	100								
Sitka, Alaska 57°03.1'N., 135°20.5'W.	883	832	221	368	220	238	224	144	170	95	82	159							
Pelican, Alaska 57°57.6'N., 136°13.8'W.	989	937	332	464	331	334	320	255	248	206	186	207	79						
Juneau, Alaska 58°17.9'N., 134°24.7'W.	879	827	288	364	254	235	220	206	148	157	140	108	162	123					
Haines, Alaska 59°13.8'N., 135°26.1'W.	950	898	359	435	325	305	291	253	219	204	186	179	176	136	88				
Skagway, Alaska 59°26.8'N., 135°19.3'W.	962	910	371	447	337	317	303	264	231	215	198	191	187	148	100	14			
Gustavus, Alaska 58°23.3'N., 135°43.6'W.	938	886	290	423	289	293	278	213	208	164	147	166	136	45	82	96	108		
CAPE SPENCER, ALASKA 58°10.0'N., 136°38.3'W.	976	924	319	451	318	321	307	242	235	193	173	195	85	18	110	124	136	32	

Distances to Sitka are partly outside.

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).

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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
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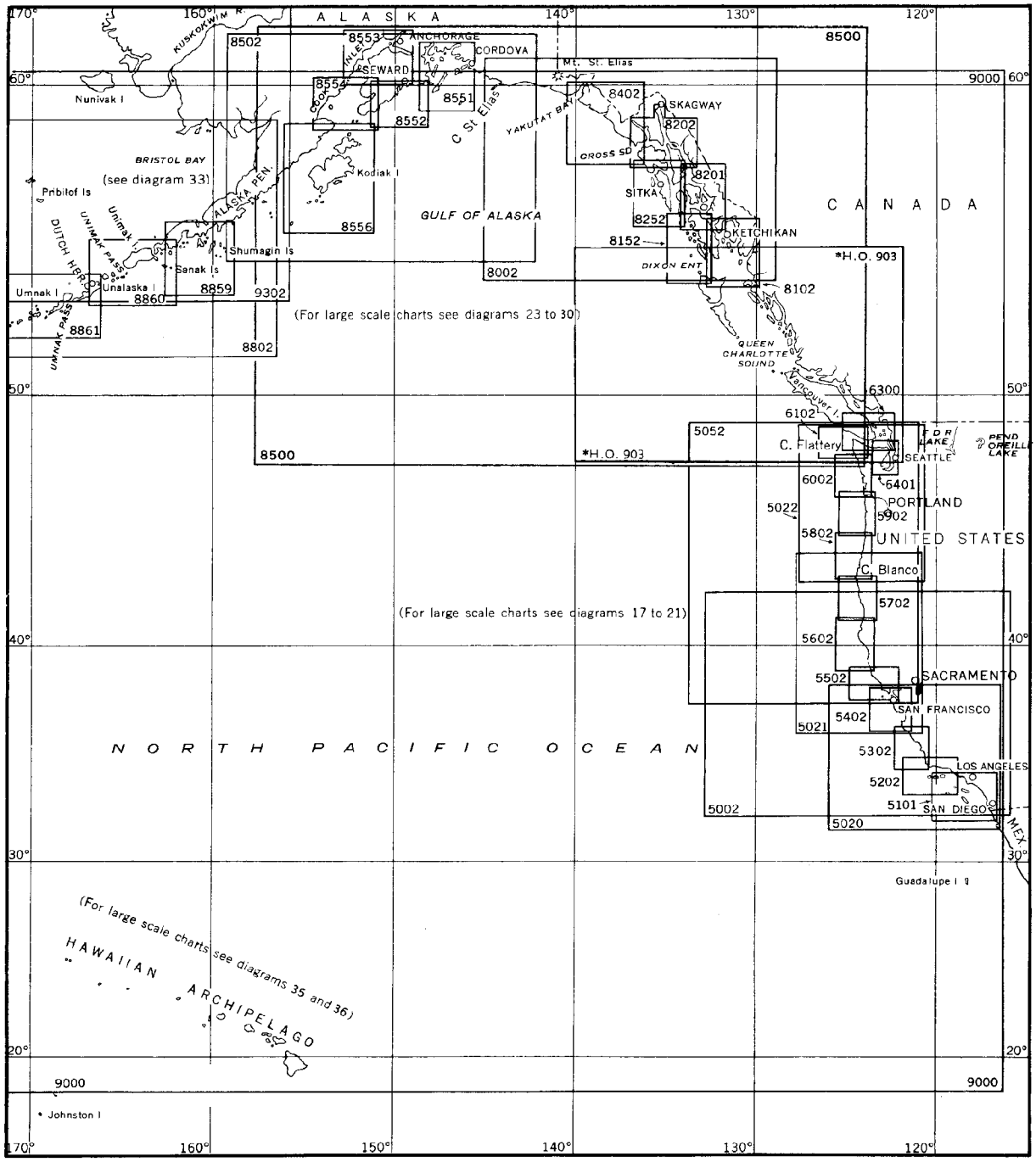
Diagram No.16

SAILING AND GENERAL CHARTS - PACIFIC COAST

October 1961



SAILING AND GENERAL CHARTS—PACIFIC COAST

No.	Price	TITLE	State	Scale	Paper size (inches)
		SAILING CHARTS			
5002	$1.00	San Diego to Point St. George		1:1,412,349	34X43
†5020	1.00	San Diego to San Francisco Bay		1:868,003	36X44
†5021	1.00	Monterey Bay to Coos Bay		1:811,980	33X45
†5022	1.00	Cape Blanco to Cape Flattery		1:736,560	33X42
5052	1.00	San Francisco to Cape Flattery		1:1,200,000	35X43
†8002	.75	Dixon Entrance to Cape St. Elias		1:969,756	33X42
†8500	1.00	Gulf of Alaska—Strait of Juan de Fuca to Kodiak Island		1:2,100,000	33X44
†8502	1.00	Cape St. Elias to Shumagin Islands		1:969,761	35X44
†8802	1.00	Alaska Peninsula and Aleutian Islands to Seguam Pass		1:1,023,188	36X43
†9000	1.00	San Diego to Aleutian Islands and Hawaiian Archipelago		1:4,860,700	36X44
†9302	.75	Bering Sea—eastern part		1:1,534,076	31X40
		GENERAL CHARTS			
5101	1.00	San Diego to Santa Rosa Island	California	1:234,270	35X50
5202	1.00	Point Dume to Purisima Point	"	1:232,188	33X48
5302	1.00	Point Conception to Point Sur	"	1:216,116	33X46
†5402	1.00	Point Sur to San Francisco	"	1;210,668	33X42
†5502	1.00	San Francisco to Point Arena	"	1:207,840	34X42
†5602	1.00	Point Arena to Trinidad Head	"	1:200,000	33X48
†5702	1.00	Trinidad Head to Cape Blanco	Calif. & Oregon	1:196,948	33X43
†5802	1.00	Cape Blanco to Yaquina Head	Oregon	1:191,730	33X48
†5902	1.00	Yaquina Head to Columbia River	Oreg. & Wash.	1:185,238	33X44
†6002	1.00	Columbia River to Destruction Island	"	1:180,789	33X41
†6102	1.00	Approaches to Strait of Juan de Fuca—Destruction Island to Amphitrite Point	Wash. & B.C.	1:176,253	35X44
6300	1.00	Strait of Georgia and Strait of Juan de Fuca	"	1:200,000	31X44
6401	.75	Admiralty Inlet and Puget Sound	Washington	1:150,000	32X41
8102	1.00	Hecate Str. to Etolin I., including Behm & Portland Canals	Alaska	1:229,376	34X43
8152	1.00	Dixon Entrance to Chatham Strait	"	1:229,376	33X45
8201	1.00	Etolin Island to Midway Islands, including Sumner Strait	"	1:217,828	34X45
8202	1.00	Midway Islands to Cape Spencer, including Lynn Canal	"	1:209,978	34X45
8252	1.00	Coronation Island to Lisianski Strait	"	1:217,828	35X45
8402	.75	Cross Sound to Yakutat Bay	"	1:300,000	33X42
8551	1.00	Prince William Sound	"	1:200,000	36X46
8552	.75	Point Elrington to East Chugach Island	"	1:200,000	31X39
8553	1.00	Cook Inlet—northern part	"	1:194,154	35X44
8554	1.00	Cook Inlet—southern part	"	1:200,000	34X42
8556	1.00	Kodiak Island	"	1:350,000	35X46
8859	1.00	Shumagin Islands to Sanak Islands	"	1:300,000	35X42
8860	1.00	Unimak and Akutan Passes and approaches	"	1:300,000	35X44
8861	1.00	Unalaska I. to Amukta I.	"	1:300,000	36X48

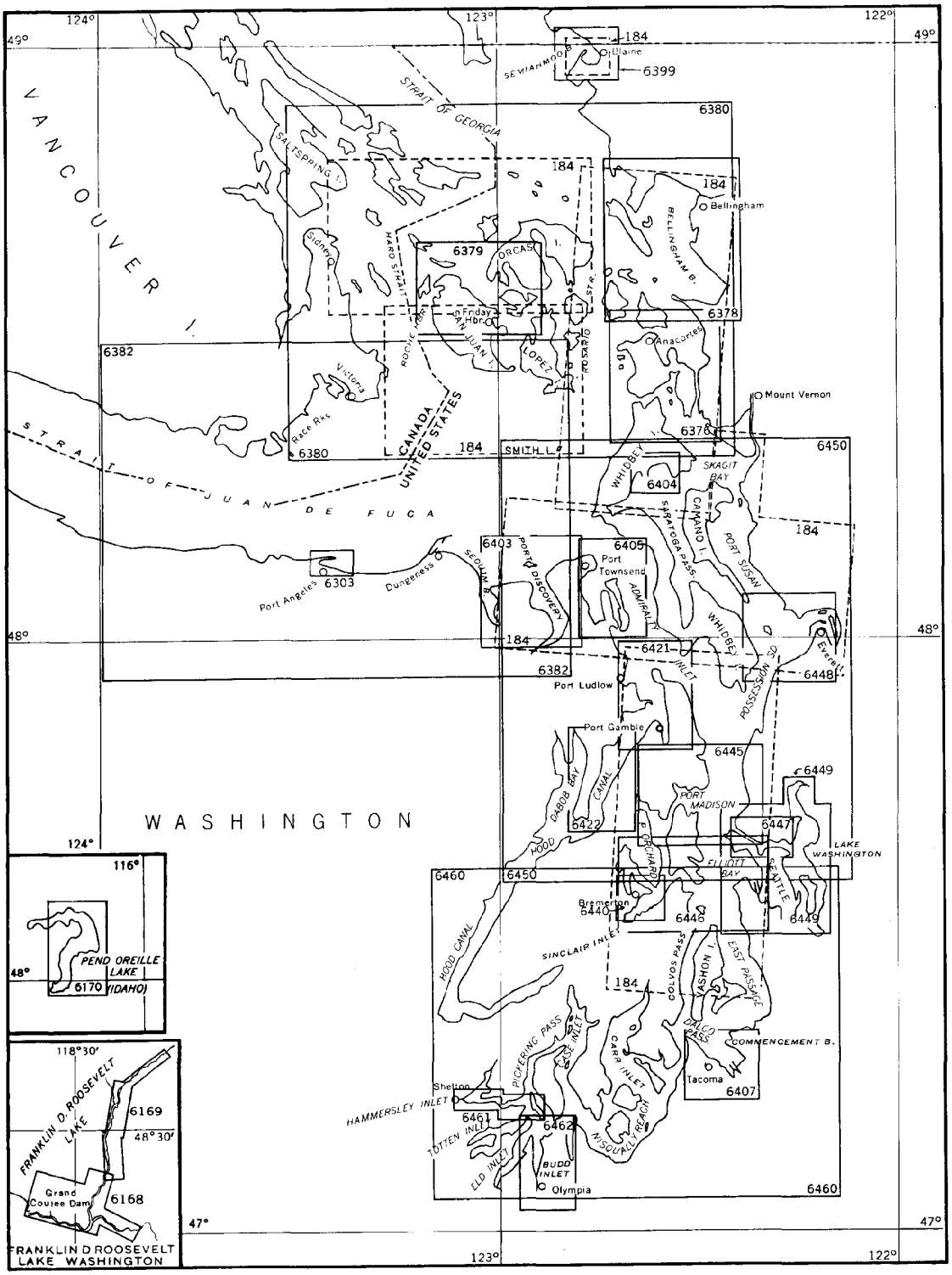
* H.O. 903 For sale by the U.S. Navy Hydrographic Office, Washington 25, D.C., and its sales agents.

† Includes Loran Lines of Position

GENERAL, COAST AND HARBOR CHARTS - PACIFIC COAST

PUGET SOUND AREA

Diagram No. 21
February 1962



GENERAL, COAST AND HARBOR CHARTS—PACIFIC COAST

PUGET SOUND AREA

No.	Price	TITLE	State	Scale	Paper size (inches)
		COAST CHARTS			
6380	$1.00	Strait of Juan de Fuca to Strait of Georgia	Wash. & B.C.	1:80,000	36X44
6382	1.00	Strait of Juan de Fuca—eastern part	"	1:80,000	34X46
6450	1.00	Admiralty Inlet and Puget Sound to Seattle	Washington	1:80,000	35X44
6460	.75	Puget Sound—Seattle to Olympia	"	1:80,000	34X41
		HARBOR CHARTS			
6303	.50	Port Angeles	Washington	1:10,000	22X29
6376	1.00	Anacortes to Skagit Bay (shows Swinomish Slough and connecting waterways on large scale)	"	1:25,000	35X41
6378	.50	Bellingham Bay	"	1:40,000	28X33
6379	.75	San Juan Channel—Friday and Roche Harbors	"	1:20,000	34X48
6399	.25	Semiahmoo Bay	"	1:30,000	17X18
6403	.25	Port Discovery and Sequim Bay	"	1:40,000	21X24
6404	.75	Oak and Crescent Harbors	"	1:10,000	33X38
6405	.75	Port Townsend	"	1:20,000	28X38
6407	.75	Tacoma Harbor	"	1:15,000	28X38
6421	.75	Hood Canal—Port Ludlow to South Point	"	1:20,000	30X40
6422	.75	Hood Canal—South Point to Bangor	"	1:20,000	30X40
6440	.50	Sinclair Inlet	"	1:10,000	25X34
6445	.75	Puget Sound—Apple Cove Point to Keyport	"	1:25,000	34X41
		Agate Passage		1:10,000	
6446	1.00	Puget Sound—Seattle to Bremerton	"	1:25,000	32X48
6447	.75	Lake Washington Ship Canal—Puget Sound to Lake Washington	"	1:10,000	33X46
6448	.25	Everett Harbor and approaches	"	1:40,000	19X23
6449	1.00	Seattle Harbor and Lake Washington	"	1:25,000	34X43
6461	.75	Puget Sound—Hammersley Inlet to Shelton	"	1:10,000	30X38
6462	.50	Olympia Harbor and Budd Inlet	"	1:20,000	22X39
		INLAND CHARTS			
6168	1.00	Franklin D. Roosevelt Lake, southern part	Washington	1:50,000	35X45
6169	.75	Franklin D. Roosevelt Lake, northern part	"	1:50,000	31X35
6170	.75	Pend Oreille Lake	Idaho	1:50,000	26X40
		SMALL-CRAFT CHART			
184	2.00	Bellingham to Seattle	Washington	1:80,000	Folio

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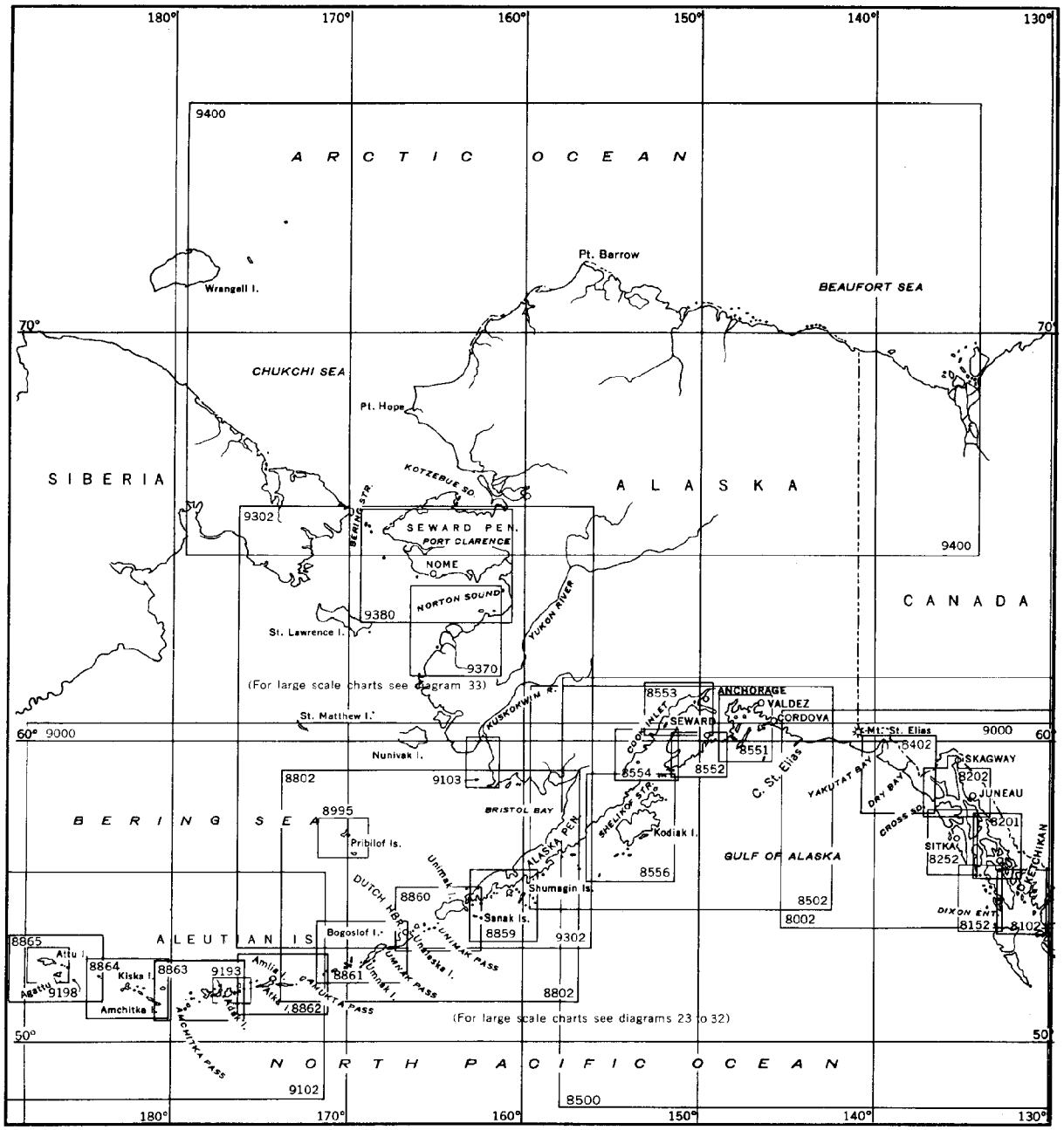
Diagram No. 22

March 1962

SAILING AND GENERAL CHARTS - ALASKA



SAILING AND GENERAL CHARTS—ALASKA

No.	Price	TITLE	Scale	Paper size (inches)
		SAILING CHARTS		
†8002	$0.75	Dixon Entrance to Cape St. Elias	1:969,756	33X42
†8500	1.00	Gulf of Alaska—Strait of Juan de Fuca to Kodiak Island	1:2,100,000	33X44
†8502	1.00	Cape St. Elias to Shumagin Islands	1:969,761	35X44
†8802	1.00	Alaska Peninsula and Aleutian Islands to Seguam Pass	1:1,023,188	36X43
†9000	1.00	San Diego to Aleutian Islands and Hawaiian Archipelago	1:4,860,700	36X44
†9102	1.00	Aleutian Islands—Amukta Island to Attu Island	1:1,126,321	35X48
†9302	.75	Bering Sea—eastern part	1:1,534,076	31X40
9400	.75	Arctic Coast	1:1,587,870	28X45
		GENERAL CHARTS		
8102	1.00	Hecate Strait to Etolin Island, including Behm and Portland Canals	1:229,376	34X43
8152	1.00	Dixon Entrance to Chatham Strait	1:229,376	33X45
8201	1.00	Etolin Island to Midway Islands, including Sumner Strait	1:217,828	34X45
8202	1.00	Stephens Passage to Cross Sound, including Lynn Canal	1:209,978	34X45
8252	1.00	Coronation Island to Lisianski Strait	1:217,828	35X45
8402	.75	Cross Sound to Yakutat Bay	1:300,000	33X42
8551	1.00	Prince William Sound	1:200,000	36X46
8552	.75	Point Elrington to East Chugach Island	1:200,000	31X39
8553	1.00	Cook Inlet—northern part	1:194,154	35X44
8554	1.00	Cook Inlet—southern part	1:200,000	34X42
8556	1.00	Kodiak Island	1:350,000	35X46
8859	1.00	Shumagin Islands to Sanak Islands	1:300,000	35X42
8860	1.00	Unimak and Akutan Passes and approaches	1:300,000	35X44
8861	1.00	Unalaska I. to Amukta I.	1:300,000	36X48
8862	1.00	Amukta Island to Igitkin I.	1:300,000	36X47
8863	1.00	Igitkin I. to Semisopochnoi I.	1:300,000	36X48
8864	1.00	Rat Islands—Semisopochnoi I. to Buldir I.	1:300,000	36X42
8865	1.00	Near Islands—Buldir I. to Attu I.	1:300,000	36X48
8995	.75	Pribilof Islands	1:200,000	32X38
9103	.50	Kuskokwim Bay	1:200,000	25X39
9193	1.00	Andreanof Islands—Atka Pass to Adak Strait	1:120,000	34X48
9198	1.00	Near Islands—Ingenstrem Rocks to Attu Island	1:160,000	33X45
9370	.75	Cape Romanzof to St. Michael	1:300,000	35X38
9380	1.00	Norton Sound	1:400,000	35X42

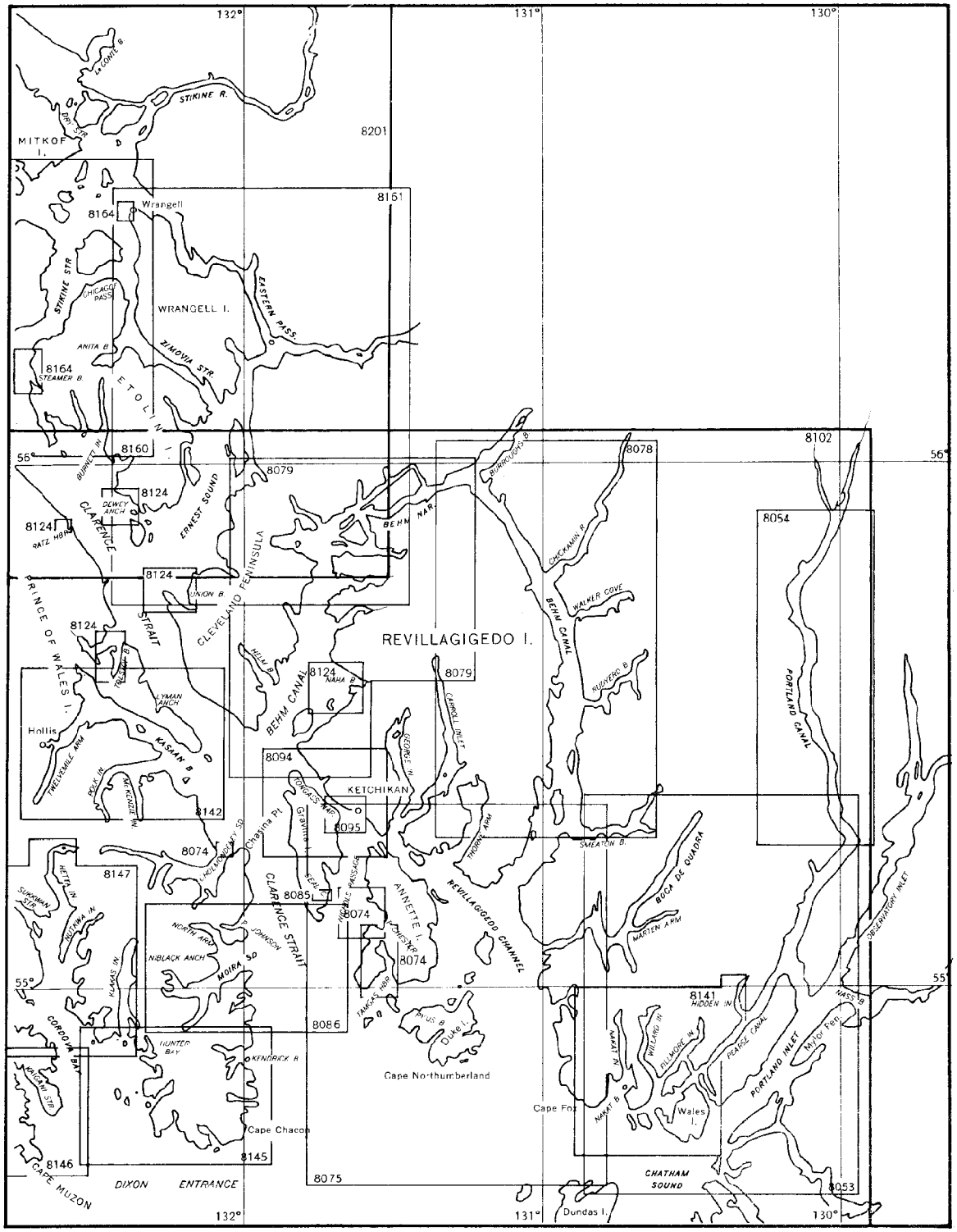
†Includes Loran Lines of Position

COAST AND HARBOR CHARTS-ALASKA

CLARENCE STRAIT

Diagram No. 23

October 1961



COAST AND HARBOR CHARTS — ALASKA

CLARENCE STRAIT

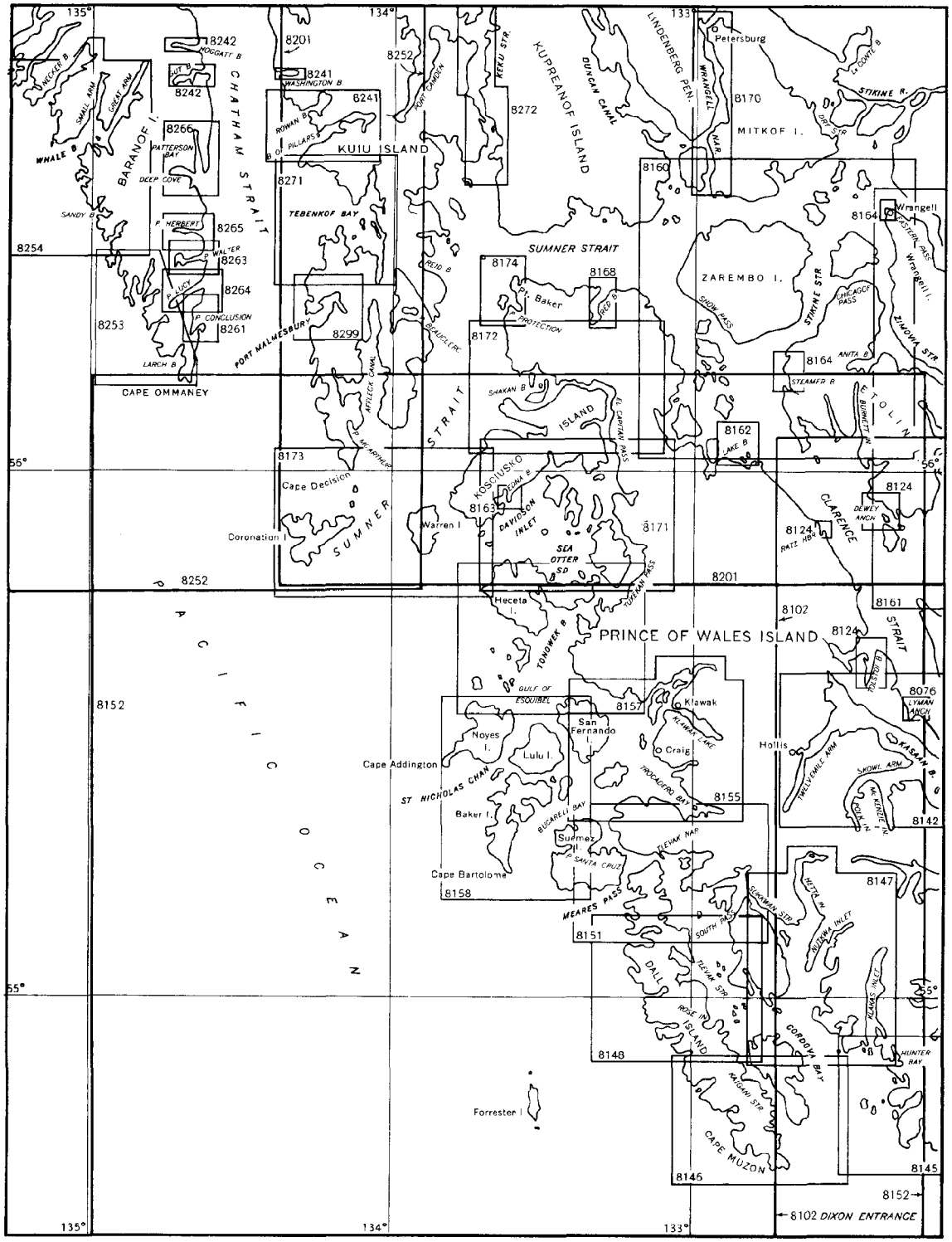
No.	Price	TITLE	Scale	Paper size (inches)
		GENERAL CHARTS		
8102	$1.00	Hecate Strait to Etolin Island, including Behm and Portland Canals	1:229,376	34X43
8201	1.00	Etolin Island to Midway Islands, including Sumner Strait	1:217,828	34X45
		COAST CHARTS		
8053	1.00	Portland Canal—Dixon Entrance to Hattie Island	1:80,000	33X45
8054	.25	Portland Canal—North of Hattie Island	1:80,000	15X41
8075	1.00	Revillagigedo Channel	1:80,000	35X44
		Ryus Bay, Duke Island	1:20,000	
8078	.75	Behm Canal—eastern part	1:80,000	26X46
8079	.75	Behm Canal—western part	1:79,334	29X37
		Yes Bay	1:40,000	
8160	.75	Zarembo Island and approaches	1:80,000	31X36
		Burnett Inlet, Etolin Island	1:20,000	
8161	1.00	Ernest Sound—Eastern Passage and Zimovia Strait	1:80,000	33X46
		Zimovia Strait	1:20,000	
		HARBOR CHARTS		
8074	.75	Harbors in Clarence Strait (4 plans)		25X40
		Chasina Anchorage, Prince of Wales I.	1:10,000	
		Port Chester, Annette Island	1:20,000	
		Tamgas Harbor, Annette Island	1:40,000	
8085	.25	Seal Cove, Nichols Passage	1:5,000	19X24
8086	1.00	Clarence Strait and Moira Sound	1:40,000	33X46
8094	.75	Tongass Narrows	1:30,000	34X38
		Ward Cove	1:10,000	
8095	.75	Ketchikan Harbor	1:10,000	33X38
8124	.50	Harbor Charts—Clarence Strait and Behm Canal (5 plans)		30X30
		Dewey Anchorage, Etolin Island	1:20,000	
		Ratz Harbor, Prince of Wales Island	1:10,000	
		Naha Bay, Revillagigedo Island Tolstoi Bay, Prince of Wales Island	1:40,000	
		Union Bay, Cleveland Peninsula	1:40,000	
8141	.75	Portland Inlet to Nakat Bay	1:40,000	34X40
8142	1.00	Kasaan Bay, Clarence Strait	1:40,000	35X45
		Hollis Anchorage, eastern part	1:10,000	
		Lyman Anchorage	1:10,000	
8145	1.00	Kendrick Bay to Shipwreck Point, Prince of Wales Island	1:40,000	33X44
8147	1.00	North end of Cordova Bay and Hetta Inlet	1:40,000	35X43
8164	.25	Steamer Bay, Wrangell Harbor and Highfield Anchorage (2 plans)		22X31
		Steamer Bay, Etolin Island	1:20,000	
		Wrangell Harbor and Highfield Anchorage	1:10,000	

COAST AND HARBOR CHARTS-ALASKA

Diagram No. 24

DIXON ENTRANCE TO SUMNER STRAIT

October 1961



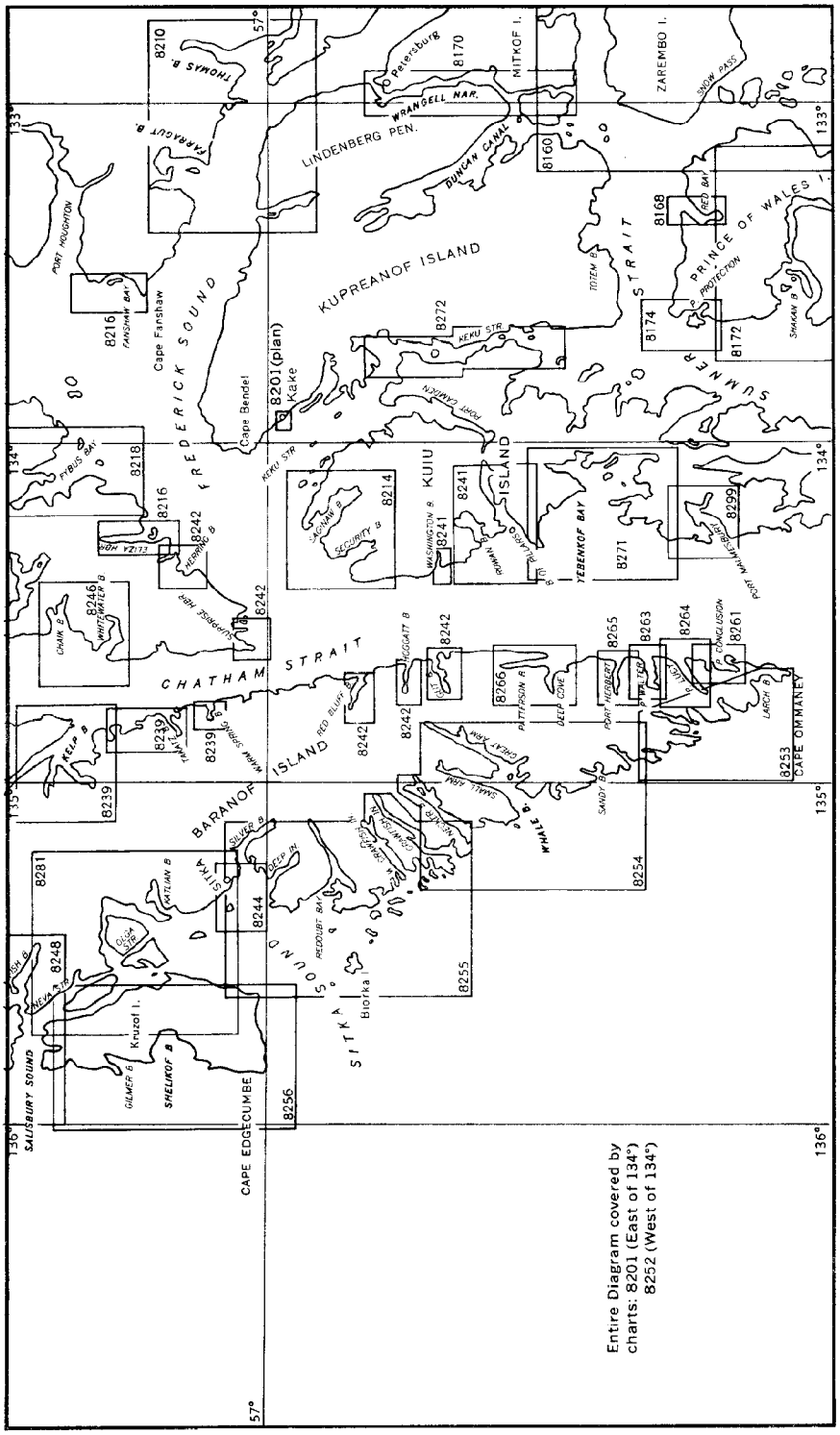
COAST AND HARBOR CHARTS—ALASKA

DIXON ENTRANCE TO SUMNER STRAIT

No.	Price	TITLE	Scale	Paper size (inches)
		GENERAL CHARTS		
8102	$1.00	Hecate Strait to Etolin Island, including Behm and Portland Canals	1:229,376	34X43
8152	1.00	Dixon Entrance to Chatham Strait	1:229,376	33X45
8201	1.00	Etolin Island to Midway Islands, including Sumner Strait	1:217,828	34X45
8252	1.00	Coronation Island to Lisianski Strait	1:217,828	35X45
		COAST CHART		
8160	0.75	Zarembo Island and approaches	1:80,000	31X36
		Burnett Inlet, Etolin Island	1:20,000	
		HARBOR CHARTS		
8076	.25	Harbors in Clarence Strait—Prince of Wales Island (3 plans; see page 23)		23X27
		Lyman Anchorage	1:10,000	
8124	.50	Harbor Charts—Clarence Strait and Behm Canal (5 plans; see page 23)		30X30
		Dewey Anchorage, Etolin Island	1:20,000	
		Ratz Harbor, Prince of Wales Island	1:10,000	
		Tolstoi Bay, Prince of Wales Island	1:40,000	
8142	1.00	Kasaan Bay, Clarence Strait	1:40,000	35X45
8146	.75	Southern Dall Island and vicinity	1:40,000	33X41
8147	1.00	North end of Cordova Bay and Hetta Inlet	1:40,000	35X43
8148	.75	Central Dall Island and vicinity	1:40,000	35X38
8151	.75	Northern part of Tlevak Strait and Ulloa Channel	1:40,000	32X42
8155	.75	Ulloa Channel to San Christoval Channel	1:40,000	35X38
		North Entrance, Big Salt Lake	1:10,000	
		South Cove, Craig	1:5,000	
8157	1.00	San Christoval Channel to Cape Lynch	1:40,000	35X42
8158	1.00	Baker, Noyes, and Lulu Islands and adjacent waters	1:40,000	34X45
8162	.75	Lake Bay and approaches, Clarence Strait	1:10,000	36X36
8163	1.00	Edna Bay, Davidson Inlet	1:5,000	33X43
8164	.25	Steamer Bay, Wrangell Harbor and Highfield Anchorage (2 plans)		22X31
		Steamer Bay, Etolin Island	1:20,000	
		Wrangell Harbor and Highfield Anchorage	1:10,000	
8168	.25	Red Bay, Prince of Wales Island	1:20,000	16X24
8170	.75	Wrangell Narrows	1:20,000	33X42
8171	1.00	Davidson Inlet and Sea Otter Sound	1:40,000	34X43
8172	.75	Shakan and Shipley Bays and part of El Capitan Passage	1:40,000	29X41
		El Capitan Passage, Dry Pass to Shakan Strait	1:10,000	
8173	1.00	Southern Entrances to Sumner Strait	1:40,000	33X47
8174	.25	Port Protection, Prince of Wales Island	1:20,000	21X30
8241	.75	Bay of Pillars and Rowan Bay, Chatham Strait (2 plans)	1:20,000	33X43
		Washington Bay, Chatham Strait	1:10,000	
8242	.50	Harbors in Chatham Strait and vicinity; Gut Bay, Hoggatt Bay (5 plans; see page 25)	1:20,000	31X32
8253	1.00	Cape Ommaney to Byron Bay, Baranof Island	1:20,000	35X46
8254	1.00	Snipe Bay to Crawfish Inlet, Baranof Island	1:40,000	33X44
8261	.75	Ports Alexander, Conclusion and Armstrong, Chatham Strait	1:10,000	31X42
8263	.25	Port Walter, Chatham Strait	1:20,000	20X21
8264	.25	Port Lucy, Chatham Strait	1:20,000	21X25
8265	.25	Port Herbert, Chatham Strait	1:20,000	18X23
8266	.50	Patterson Bay and Deep Cove, Chatham Strait	1:20,000	25X33
8271	.50	Tebenkof Bay, Chatham Strait	1:40,000	27X32
8272	1.00	Keku Strait—Monte Carlo Island to Entrance Island	1:20,000	33X44
		The Summit and Devils Elbow	1:10,000	
8299	.25	Port Malmesbury, Chatham Strait	1:40,000	16X18

Diagram No. 25

October 1961



Entire Diagram covered by charts: 8201 (East of 134°) 8252 (West of 134°)

COAST AND HARBOR CHARTS-ALASKA

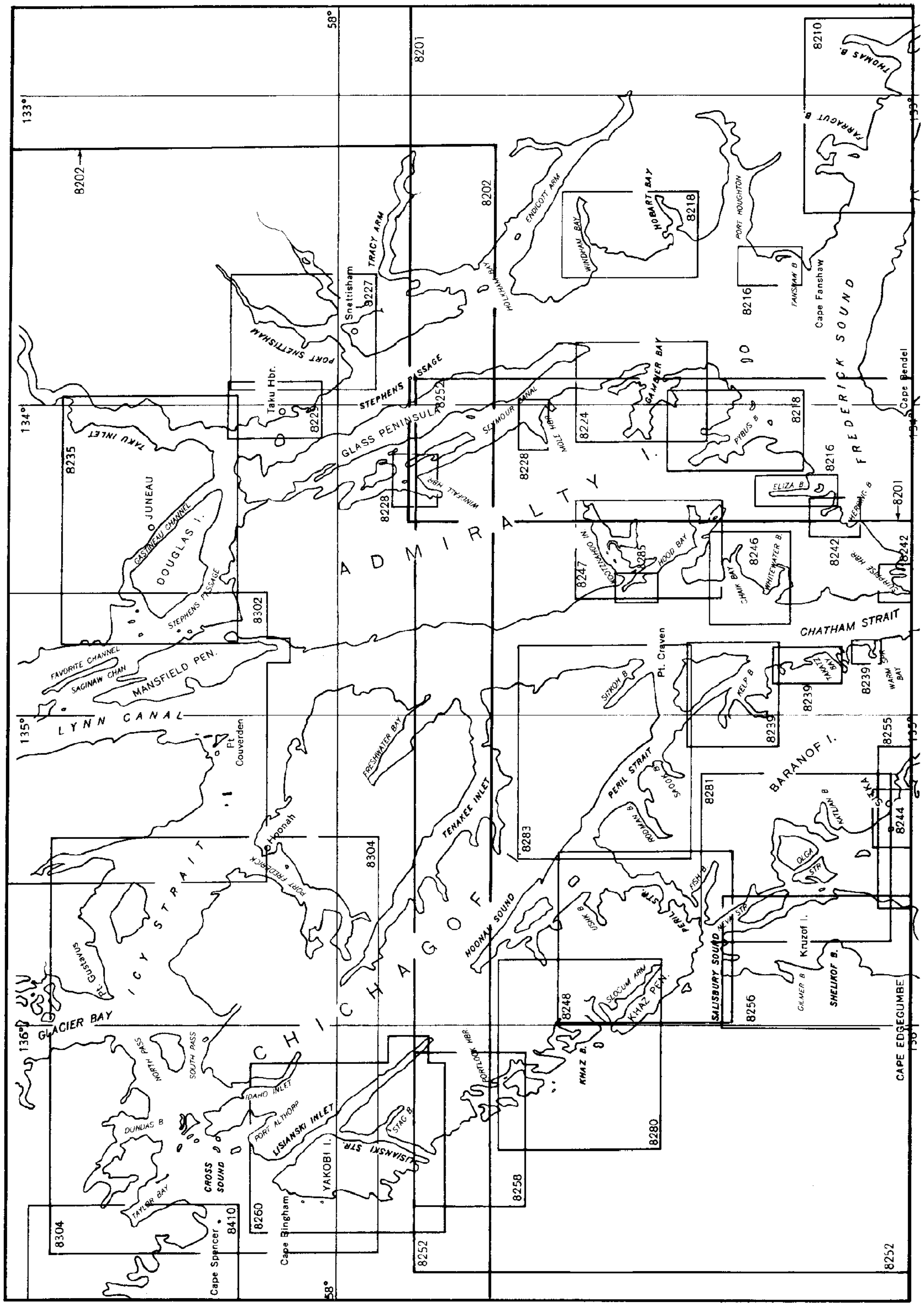
SUMNER STRAIT TO FREDERICK SOUND

COAST AND HARBOR CHARTS—ALASKA

SUMNER STRAIT TO FREDERICK SOUND

No.	Price	TITLE	Scale	Paper size (inches)
		GENERAL CHARTS		
8201	$1.00	Etolin Island to Midway Islands, including Sumner Strait	1:217,828	34X45
8252	1.00	Coronation Island to Lisianski Strait	1:217,828	35X45
		HARBOR CHARTS		
8168	.25	Red Bay, Prince of Wales Island	1:20,000	16X24
8170	.75	Wrangell Narrows	1:20,000	33X42
8174	.25	Port Protection, Prince of Wales Island	1:20,000	21X30
8201	1.00	Kake Harbor (plan)	1:10,000	
8210	.75	Thomas, Farragut, and Portage Bays, Frederick Sound	1:40,000	32X41
8214	.25	Saginaw and Security Bays, Frederick Sound	1:40,000	22X25
8216	.50	Woewodski and Eliza Harbors, Fanshaw Bay and Cleveland Passage, Frederick Sound	1:20,000	28X29
8218	.75	Pybus Bay, Frederick Sound	1:40,000	30X36
8239	.75	Bays in Chatham Strait (3 plans)		32X38
		Kelp Bay	1:40,000	
		Warm Spring Bay Takatz and Kasnyku Bays	1:20,000	
8241	.75	Bay of Pillars and Rowan Bay, Chatham Strait (2 plans)	1:20,000	33X43
		Washington Bay, Chatham Strait	1:10,000	
8242	.50	Harbors in Chatham Strait and vicinity (5 plans)		31X32
		Gut Bay, Hoggatt Bay and Red Bluff Bay, Chatham Strait	1:20,000	
		Herring and Chapin Bays, Surprise Harbor and Murder Cove, Frederick Sound	1:20,000	
8244	.75	Sitka Harbor and approaches	1:10,000	35X41
		Sitka Harbor	1:5,000	
8246	.75	Whitewater Bay and Chaik Bay, Chatham Strait	1:20,000	33X41
8253	1.00	Cape Ommaney to Byron Bay, Baranof Island	1:20,000	35X46
8254	1.00	Snipe Bay to Crawfish Inlet, Baranof Island	1:40,000	33X44
8255	1.00	Crawfish Inlet to Sitka, Baranof Island	1:40,000	35X46
		Sawmill Cove	1:5,000	
8256	.75	South and West Coasts of Kruzof Island	1:40,000	28X45
8261	.75	Ports Alexander, Conclusion, and Armstrong, Chatham Strait	1:10,000	31X42
8263	.25	Port Walter, Chatham Strait	1:20,000	20X21
8264	.25	Port Lucy, Chatham Strait	1:20,000	21X25
8265	.25	Port Herbert, Chatham Strait	1:20,000	18X23
8266	.50	Patterson Bay and Deep Cove, Chatham Strait	1:20,000	25X33
8271	.50	Tebenkof Bay, Chatham Strait	1:40,000	27X32
8272	1.00	Keku Strait—Monte Carlo Island to Entrance Island	1:20,000	33X44
		The Summit and Devils Elbow	1:10,000	
8281	.75	Sitka Sound to Salisbury Sound, Inside Passage	1:40,000	35X38
		Neva Strait—Neva Point to Zeal Point	1:20,000	
8299	.25	Port Malmesbury, Chatham Strait	1:40,000	16X18

Diagram No. 26
March 1962



COAST AND HARBOR CHARTS-ALASKA
FREDERICK SOUND TO ICY STRAIT

COAST AND HARBOR CHARTS—ALASKA

FREDERICK SOUND TO ICY STRAIT

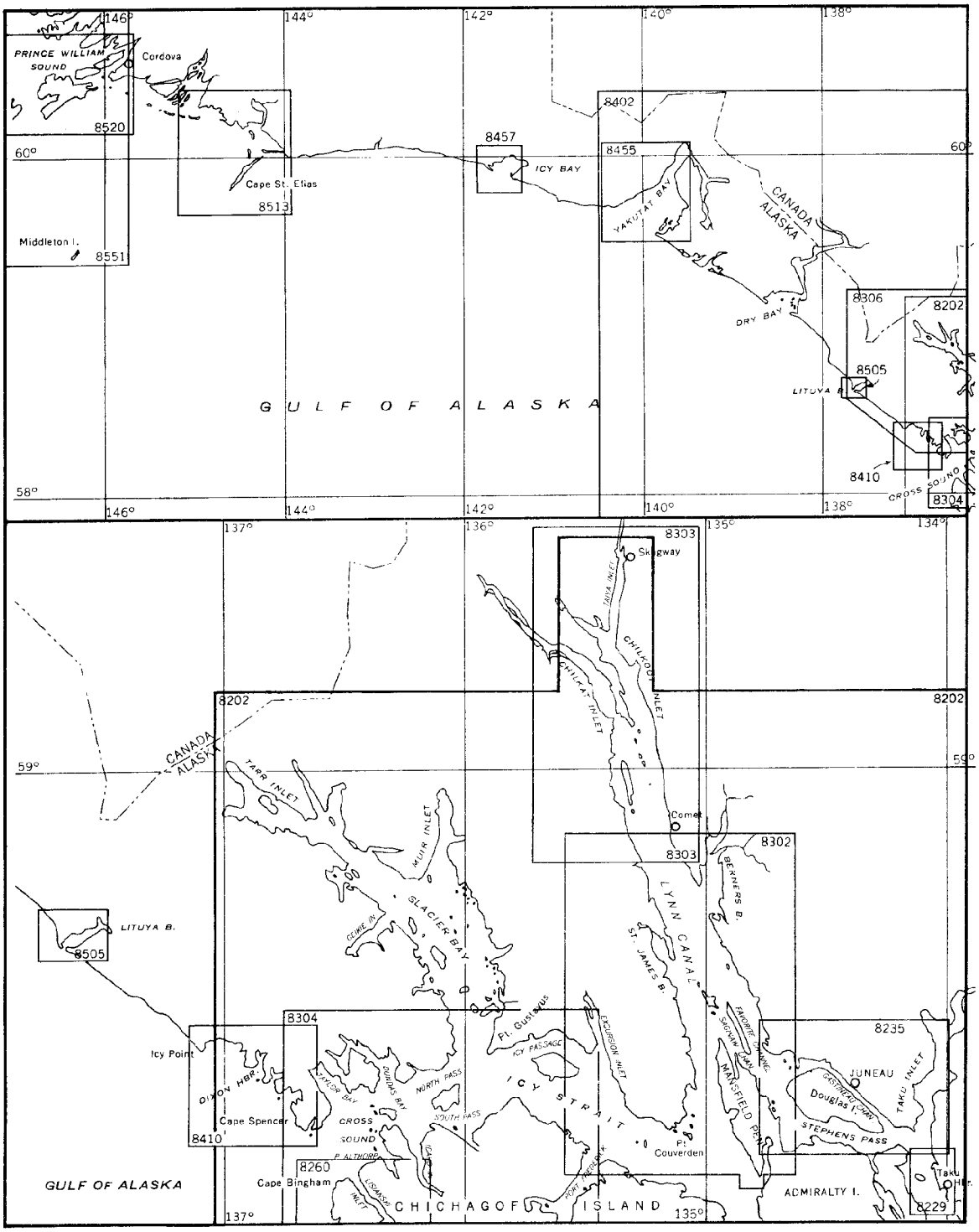
No.	Price	TITLE	Scale	Paper size) (inches
		GENERAL CHARTS		
8201	$1.00	Etolin Island to Midway Islands, including Sumner Strait	1:217,828	34X45
8202	1.00	Stephens Passage to Cross Sound, including Lynn Canal	1:209,978	34X45
8252	1.00	Coronation Island to Lisianski Strait	1:217,828	35X45
		COAST CHARTS		
8302	.75	Lynn Canal—Icy Strait to Point Sherman	1:80,000	30X46
		Funter Bay	1:20,000	
		Hawk Inlet, Chatham Strait	1:40,000	
8304	.75	Icy Strait and Cross Sound	1:80,000	33X42
		Inian Cove	1:20,000	
		Elfin Cove	1:10,000	
		HARBOR CHARTS		
8210	.75	Thomas, Farragut, and Portage Bays, Frederick Sound	1:40,000	32X41
8216	.50	Woewodski and Eliza Harbors, Fanshaw Bay and Cleveland Passage, Frederick Sound	1:20,000	28X29
8218	.75	Pybus Bay, Frederick Sound, and Hobart and Windham Bays, Stephens Passage	1:40,000	30X36
8224	.25	Gambier Bay, Stephens Passage	1:40,000	22X27
8227	.50	Port Snettisham, Stephens Passage	1:40,000	25X29
8228	.50	Windfall and Mole Harbors, Seymour Canal	1:20,000	21X34
8229	.50	Slocum and Limestone Inlets and Taku Harbor	1:20,000	23X33
8235	1.00	Gastineau Channel and Taku Inlet	1:40,000	36X48
		Juneau Harbor	1:10,000	
8239	.75	Bays in Chatham Strait (3 plans)		32X38
		Kelp Bay	1:40,000	
		Warm Spring Bay Takatz and Kasnyku Bays	1:20,000	
8242	.50	Harbors in Chatham Strait and vicinity (5 plans; see page 25)		31X32
		Herring and Chapin Bays	1:20,000	
8244	.75	Sitka Harbor and Approaches	1:10,000	35X41
		Sitka Harbor	1:5,000	
8246	.75	Whitewater Bay and Chaik Bay, Chatham Strait	1:20,000	33X41
8247	.75	Hood Bay and Kootznahoo Inlet, Chatham Strait	1:30,000	28X40
8248	.75	Salisbury Sound and Peril Strait to Emmons Island	1:40,000	35X36
		Sergius Narrows, Peril Strait	1:20,000	
8256	.75	South and West Coasts of Kruzof Island	1:40,000	28X45
8258	.50	Cape Edward to Lisianski Strait, Chichagof Island	1:40,000	25X32
8260	.75	Yakobi Island and Lisianski Inlet	1:40,000	35X40
		Pelican Harbor	1:10,000	
8280	.75	Khaz Bay, Chichagof Island	1:40,000	34X40
		Elbow Passage	1:10,000	
8281	.75	Sitka Sound to Salisbury Sound, Inside Passage	1:40,000	35X38
		Neva Strait—Neva Point to Zeal Point	1:20,000	
8283	1.00	Peril Strait—Hoonah Sound to Chatham Strait	1:40,000	35X44
8285	.50	Killisnoo Harbor, Chatham Strait	1:10,000	23X31

GENERAL, COAST AND HARBOR CHARTS - ALASKA

Diagram No. 27

LYNN CANAL TO PRINCE WILLIAM SOUND

March 1962



GENERAL, COAST AND HARBOR CHARTS—ALASKA

LYNN CANAL TO PRINCE WILLIAM SOUND

No.	Price	TITLE	Scale	Paper size (inches)
		GENERAL CHARTS		
8202	$1.00	Midway Islands to Cape Spencer, including Lynn Canal	1:209,978	34X45
8402	.75	Cross Sound to Yakutat Bay	1:300,000	33X42
8551	1.00	Prince William Sound	1:200,000	36X46
		COAST CHARTS		
8302	.75	Lynn Canal—Icy Strait to Point Sherman	1:80,000	30X46
		Funter Bay	1:20,000	
		Hawk Inlet, Chatham Strait	1:40,000	
8303	.75	Lynn Canal—Point Sherman to Skagway	1:80,000	29X44
		Portage Cove, Chilkoot Inlet	1:10,000	
		Skagway and Nahku Bay	1:10,000	
8304	.75	Icy Strait and Cross Sound	1:80,000	33X42
		Inian Cove	1:20,000	
		Elfin Cove	1:10,000	
8455	.75	Yakutat Bay	1:80,000	30X34
		Yakutat Harbor	1:10,000	
8513	.75	Controller Bay	1:100,000	31X34
8520	1.00	Prince William Sound—eastern entrance	1:80,000	34X45
		HARBOR CHARTS		
8229	.50	Slocum and Limestone Inlets and Taku Harbor	1:20,000	23X33
8235	1.00	Gastineau Channel and Taku Inlet	1:40,000	36X48
		Juneau Harbor	1:10,000	
8410	.75	Cape Spencer to Icy Point	1:40,000	33X41
8457	.75	Icy Bay	1:40,000	31X33
8505	.50	Lituya Bay	1:20,000	27X36
		Lituya Bay Entrance	1:10,000	

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

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