

A ledge, just a few feet above high water, extends 0.5 mile off the point. No dangers were noted outside of this ledge. All of this ledge is not above high water; the depth is 5 fathoms between the outer end and inner parts. The outer end is a reef which is continually awash, due to the ocean swell, at all stages of the tide, but may actually be 2 feet above low water.

Raven Bay, on the west side of Reef Point, is entered on either side of Ogangen Island and extends 3.5 miles inland. The island, 1,180 feet high and 2 miles long by 0.5 mile wide, has its longer axis paralleling the west shore of the bay; the passage between is 0.2 to 0.4 mile wide and has depths of 9 to 15 fathoms.

East of Ogangen Island, the bay narrows from a width of 2 miles at the entrance to 0.3 mile at the north end of the island; depths are 25 to 40 fathoms. Northeast of the island, Crow Arm, narrow and stocking-shaped, extends 1 mile to the north; the arm is too deep for the restricted swinging room and is subject to considerable swell during southerly weather.

The west arm of Raven Bay narrows to 250 yards 0.6 mile north of Ogangen Island and continues north for another mile; excellent anchorage for small boats may be had in 8 fathoms just south of the prominent islet at the head of the arm. The sandflats at the extreme head are suitable for beaching small craft.

The small cove west of the middle part of the narrows affords anchorage for small boats in 3 to 5 fathoms, but the swinging room is restricted by the reef on the west side. At the head of the cove are abandoned saltery buildings.

A rock which uncovers is 400 yards south of the cove and slightly to the east of midchannel; the best water is west of the rock. Just south of the entrance to the narrows, 4½-fathom rocky shoal can be avoided by favoring the shore on either side.

Eagle Bay, 3 miles west of Raven Bay, is about 1.3 miles wide at its entrance and extends 2.5 miles in a northerly direction; it is characterized by a particularly rugged and precipitous shoreline. High rocky cliffs rise directly from the high waterline in most parts of the bay and even where cliffs do not exist, the rise is very steep and broken. The very rugged country surrounding Eagle Bay causes violent williwaws in northwesterly, northerly, and easterly weather. Snipe Point, which divides the bay into two arms, is very rugged at its southern tip and quite rough and weathered on the top.

The eastern side of the entrance to the bay is marked by Spire Rock, a very sharp pinnacle, 100 feet high and about 100 yards offshore. On the western side of the entrance Label Reef, awash at high water, extends about 100 yards offshore from the eastern side of Eagle Point. This reef is plainly visible at any stage of the tide because of breakers.

Each arm of Eagle Bay is about 1 mile long and both extend in a northeasterly direction. The northernmost arm is only 0.4 mile wide at its widest point and has numerous islands near its head. The islands are flat, grass covered on top, with steep rocky sides rising directly from the water, and are used as nesting places

by many birds in the summer months. The arm is navigable as far as these islands.

The eastern arm of Eagle Bay is about 0.5 mile wide for half of its length, and affords good shelter in all but extreme southerly weather about 0.3 mile inside the entrance.

Good anchorage may be had in Eagle Bay, but the southerly swell is often uncomfortable. Anchorage with protection from all weather is available below the island in the northern arm, but swinging room is limited. Depths of 11 fathoms extend into both arms of the bay; however, broken bottom with a 3¼-fathom spot extends from Snipe Point almost halfway across the entrance to the northern arm.

A portage at the head of Eagle Bay leads to Pumicestone Bay on the north side of the island.

Eagle Point is the prominent headland between Eagle and Kuliliak Bays. The point is very rugged at its southern end, and is distinguished by two prominent mountain peaks. The southern peak, located at the extreme southern end of the point, is 1,340 feet high; when viewed from the south, it appears conical in shape with a very sharp top, but from the east or west it appears flat on top, with a sharp, rock peak at the south end of the flat portion. The northerly peak, about 1 mile northeast from the southerly one, is 1,520 feet high, and appears pyramidal in shape from all directions, with a bare rock top. The blunt, southern face of the cape is much weathered, with high rock cliffs, numerous slides, and many pinnacle rocks along the shore.

A shoal, with 14 fathoms 0.4 mile from shore, makes out to southward from the most southerly tip of Eagle Point. Passing vessels are advised to stay at least 0.5 mile off the cape in order to keep outside the 20-fathom curve.

Appreciable tidal current was noted for a distance of 1 mile off Eagle Point. The flood sets westward and the ebb eastward. With an appreciable swell running against this current, high, sharp, broken seas, with curling tops resembling tide rips, were noted off the point.

Chart 9020.—Kuliliak Bay indents the southeast coast of Unalaska Island immediately to the westward of Eagle Point. The bay is divided by a narrow ridge of land into two parts, forming an outer bay and a well-protected inner bay. The end of this narrow ridge of land, Repetition Point, is the eastern point of the entrance to the inner bay.

A chain of low, black rocks extends 325 yards offshore in a southwest direction from the southwest corner of Eagle Point and marks the east side of the entrance to outer Kuliliak Bay. A shoal, covered 18 fathoms, 0.8 mile from shore, extends southwestward from the outer rock of this group. Vessels entering Kuliliak Bay from eastward should give the point a berth of 1 mile to avoid the shoal.

Outer Kuliliak Bay is open to the south. The shores are characterized by rock cliffs, except at the head of the deep bight which forms the northeastern part of the outer bay. At the head of this bight is a sand beach and a valley passes north of Eagle Point into Eagle Bay. Anchorage in 13 to 14 fathoms may be had at the opening

of the bight, with some protection in southeasterly weather and good protection in northerly and northwesterly weather.

A reef, with the outer part of it awash at half-tide, makes out from the center of the north shore of outer Kuliliak Bay, and a shoal covered 8 fathoms extends 330 yards southward from the reef. Otherwise the bottom of the outer bay is very even, decreasing in depth very gradually from 30 fathoms at the entrance to 12 fathoms at an average distance of about 200 yards off the northern shore.

Inner Kuliliak Bay affords good shelter east of Nest Rock in 7 fathoms in all weather. The entrance is about 500 yards wide between the cliffs 200 feet high on the western side and on the steep tip of Repetition Point on the eastern side.

Dome Rock, the outer rock of a conspicuous group which extends 120 yards southwestward from Repetition Point, is a good landmark on the eastern side of the entrance to the inner bay; the rock is about 30 feet wide and 5 feet high.

Along the west shore of the entrance to inner Kuliliak Bay, flat reefs, rocks awash, covered rocks, and heavy kelp form a fringe some 200 yards wide. In this area is a large black rock, part of which rises to a sharp point 10 feet above high water, 75 yards out from the base of the shore cliff. About 160 yards northeast from this large, black rock and 180 yards offshore is **Perch Rock**, a small, black rock about 1 foot high and surrounded by kelp.

Trava Point is a small, flat, grassy point on the south side of inner Kuliliak Bay and 0.5 mile northeast of the entrance. **Nest Rock** is a small, grass-covered rock island, 15 feet high and 0.9 mile northeast of the entrance. **Williwaw Point** is a low, sandy point 0.3 mile beyond Nest Rock. A cascade is 0.5 mile inland from the head of the bay.

The western shore of the inner bay is a curving, pebble beach fronting a low, grassy bluff. A low, wide valley, through which fog often drifts and winds always draw in northerly and westerly weather, extends across Unalaska Island to Kashega Bay. The western and northwestern shores of the inner bay, eastward of Nest Rock, are lined with low reefs, rocks awash and covered, and heavy kelp for a distance of 100 to 300 yards offshore. A rock, awash at half tide and surrounded by kelp, lies 300 yards off the north shore directly north of the entrance. A fringe of heavy kelp, 50 yards wide, lines the south shore from the entrance to Trava Point.

Proceeding to sheltered anchorage inside the inner bay, the controlling depth is $4\frac{1}{2}$ fathoms after passing the entrance. A channel with this depth lies close to the southeast shore of the bay and just outside a heavy fringe of kelp along the northwest shore of Repetition Point. On the north side of this channel the water shoals very gradually to the opposite side of the bay. Northeast of Trava Point the water deepens and the bottom is flat.

In northerly and westerly weather violent williwaws occur in the head of inner Kuliliak Bay, above Williwaw Point. In southerly weather short seas, almost breaking across the entrance, make it difficult to enter.

Westward of Kuliliak Bay the country is less rugged; the peaks are lower and are separated by wide valleys. In the spring and early summer the snow disappears from all the peaks to the westward, while in the area east of Kuliliak Bay many peaks remain snow-covered throughout the summer.

From Kuliliak Bay the shore trends southwestward for 11 miles to Lance Point. Rocky ledges extend some distance off the intervening points.

Lance Point, 12 miles southwestward of Eagle Point, is 465 feet high and has the appearance of a low tongue projecting from the higher land northward of it. **Huddle Rocks**, four small islands, the largest 170 feet high, are about 1 mile southwestward of the point.

About 5 miles westward of Lance Point is a small bight that affords shelter for small craft in all but southeasterly weather. Many rough rocky ledges extend from the shore between Lance Point and this small bight, at the head of which is a broad sand beach divided into two parts by a small rocky point. Three streams flow through the low, grassy valley behind the beach. An islet, 70 feet high, is southeast of the low point which forms the southern side of the bight; rocks awash are 300 yards northeast of the islet. A chain of small rocky islets extends across the entrance to the bight, and a broad, flat reef that uncovers 1 foot lies northwest of these islets.

Cape Aiak, on the south coast of Unalaska Island, 8 miles southwestward of Lance Point or about 15 miles from Konets Head, is 1,820 feet high, and from the northeastward at a distance appears like a flat-topped island with a massive horn or pinnacle on the southern slope. Breakers extend 300 yards southward from the south end of the point.

Between Cape Aiak and Konets Head, the flood current sets westward toward Umnak Pass and increases in velocity as the pass is approached. It is strongest near the shore. The ebb is weaker than the flood.

Surveyor Bay, on the west side of Cape Aiak, is 4 miles wide and 2 miles in depth. About 2 miles northwestward of Cape Aiak, the **Gargoyle Islands**, a group of fantastically eroded pinnacles about 250 feet high, make out 0.4 mile from a point on the north shore and divide the bay into two bights. A reef, awash at high water, connects the islands to the shore.

A shoal, which has a least depth of 3 fathoms and breaks in heavy weather, is 0.3 mile southward from the southwestern extremity of the islands; another 3-fathom shoal is 0.6 mile westward of the same point and 0.5 mile southward of a reef-fringed islet close to shore.

Small-boat anchorage with some shelter from southeastward can be found in 5 fathoms 250 yards from the shore in the cove northwest of the Gargoyle Islands. In using the anchorage, care must be taken to avoid a covered rock 400 yards from shore which breaks in moderate weather. The anchorage is not recommended but is the best available shelter between Kuliliak Bay and Umnak Pass.

The westerly bight of Surveyor Bay has low sand dunes along its northern shore; the western shore is fringed with ledges, one of which extends 700 yards off.

A 4½-fathom rocky patch, 1.5 miles north-northeastward from Serpent Point, is approximately in the center of the bight.

Serpent Point, on the west side of the entrance to Surveyor Bay, is a low narrow point projecting southeastward. Anchorage with good shelter except from the south and southeastward can be found 0.8 mile north of the point and 0.5 mile from the west shore of the bay in 15 fathoms. An 8-fathom shoal is 0.5 mile southward of the point.

Chart 9021.—About 1.8 miles westward of Serpent Point, a chain of grassy islets projects southward from **Cape Izigan** and terminates in **South Rock**, 23 feet high; this is the southernmost land feature of Unalaska Island. **South Rock** is 6 miles southwestward of Cape Alak and 9 miles southeastward of Konets Head, the west end of Unalaska Island. Depths of 20 fathoms are found 300 yards off the south side of the rock.

Tiderip Point, 6 miles northwestward from **South Rock**, is marked by a round hill 397 feet high. A chain of rocks, one 25 feet high, extends 0.5 mile southward from the point.

Konets Head, the western extremity of Unalaska Island, is marked by a conspicuous knoll 127 feet high.

Lone Peak, about 3.5 miles northeastward of Konets Head, is the top of a long narrow ridge, 1,847 feet high, running roughly parallel to the coast. From northeastward and southwestward the peak appears like a sharp cone and forms a useful landmark.

The shore between Tiderip Point and Konets Head is fringed by reefs and ledges extending almost 0.5 mile offshore. Ledges extend about 300 yards westward from Konets Head but deep water is found 400 yards westward of the ledges. A bank, with a least depth of 8 fathoms surrounded by much deeper water, is 1.8 miles westward from Konets Head. Heavy tide rips occur on this bank on the ebb.

About 1.5 miles south of Konets Head is **Emerald Island**, a flat-topped, grassy island 0.3 mile in diameter and 204 feet high. The island is fringed by reefs, and a rock that uncovers 3 feet lies 700 yards southeastward of it. Another group of rocks, the highest 8 feet, is 0.5 mile to the northward of the island. Rocks extend 350 yards off the west side of the island.

By using the channel between Emerald Island and Konets Head the tide rips to the southward of Emerald Island can be avoided. The narrowest part of the channel is at the northwest end, where it is less than 0.4 mile in width. The shores bordering the pass are broken with many projecting ledges, but these can be distinguished easily.

Irregular bottom with depths of 6½ to 12 fathoms extends 3.5 miles southward of Emerald Island. Tide rips which have the appearance of breakers occur on these spots on the ebb; with a strong ebb and an opposing breeze they attain considerable size. It is advisable to avoid this area.

Polivnoi Rock, 17 feet high and 100 yards in diameter, is 5 miles southwestward from Konets Head; a breaker

is 300 yards southwestward of the rock. Sea lions are often seen in the vicinity. In heavy weather, seas wash over the rock. An 8-fathom rocky shoal, marked by heavy tide rips, is 1.2 miles 065° from the rock.

A convenient anchorage in southerly weather can be found about 1 mile eastward of Konets Head in about 20 fathoms. In approaching this anchorage on the ebb, allowance should be made for the current. The flood is not felt immediately northward of Konets Head.

A small bank, with a least depth of 5¼ fathoms, is about 0.5 mile from shore, 2 miles northeastward from Konets Head. Northeastward of the bank, the shore is steep-to and is exposed to the strong current of Umnak Pass.

Boulder Bay, 5 miles northeastward from Konets Head, is a small bay with a kelp patch in the middle of its entrance. Two small shacks are in a cove on the eastern shore.

No Name Cove, 3 miles northeast of Boulder Bay and on the west side of **Ranchers Point**, is a small bay about 0.5 mile wide and 0.5 mile in depth. A small indentation on its western side furnishes good shelter for small craft except in severe northerly weather.

Station Bay, on the east side of Ranchers Point, is divided into two arms. The eastern arm is about 0.3 mile wide and 1.5 miles long in a southeasterly direction. The buildings of a ranch are on the west shore near the head of this arm. Anchorage for small vessels can be found off these buildings in 7 fathoms. Near the entrance to this arm is a conspicuous column rock about 94 feet high.

Peacock Point, separating Station Bay from the unnamed bight to the eastward, has broken ledges and rocks extending 700 yards northwestward. The western arm of the bay is about 0.5 mile wide and almost 1 mile long in a southerly direction.

Chernofski Harbor, 2 miles east of Station Bay, was described earlier in this chapter.

Umnak Pass, separating Unalaska Island from Umnak Island, is about 3 miles wide and about 10.5 miles long in a northeast and southwest direction from the vicinity of Polivnoi Rock to that of Pustoi Island. For description of the shore, see various headings previously described in connection with Unalaska Island and those following in connection with Umnak Island.

Currents.—The current in Umnak Pass is similar to that in Unimak Pass. At times of tropic tides the current may set in a flood direction for as much as 18 hours. The current velocity is 3.5 knots on the flood and sets northeastward, and 2.5 knots on the ebb and sets southwestward. Velocities of 4.5 knots have been observed.

The current velocity is 2.5 knots near Polivnoi Rock, knots on the ebb between Konets Head and Emerald Island. Velocities of 4.5 knots have been observed. The flood current causes a set almost at right angles to the course when navigating Umnak Pass.

The current velocity is 2.5 knots near Polivnoi Rock. Current predictions for Umnak Pass are contained in the Tidal Current Tables.

The effect of the current in Umnak Pass is felt in a diminishing degree as far as Cape Idak and Cape Aspid on

the north side, and on the south side it is felt about 10 miles to the southward of Polivnoi Rock.

On the ebb, very pronounced tide rips occur on the south sides of the shoaler banks in Umnak Pass and in the southern approach. These tide rips are different from the tide rips encountered in Akutan Pass and Unalga Pass. In smooth weather they look like a line of breakers and may attain a considerable height. In moderate or stormy weather they merge with the seas, increasing their roughness to a considerable extent.

On the flood, light confused tide rips occur in the vicinity of Ship Rock and on the banks to the northeastward of it, while the pass, with its countercurrents, resembles a broad, shallow river, the effect being caused by several lanes of currents and countercurrents. Off the points along the Umnak Island shore, tide rips are dangerous for skiffs and small launches, especially between Otter Point and Kettle Cape.

From the southward, navigation is more difficult, as Polivnoi Rock is low and Kettle Cape is not easily distinguishable against the higher background. With a heavy, southerly swell and a strong ebb it might even be found dangerous to attempt the pass on account of heavy tide rips. The passage north of Emerald Island might be found preferable under such circumstances.

In the approach to the pass the soundings are confusing as there are numerous banks with depths of 6 to 10 fathoms at distances of 4 to 6 miles from Emerald Island and Polivnoi Rock.

Routes.—The following courses through Umnak Pass will avoid the worst of the tide rips: From a position 1 mile east of Ship Rock make good course 217° for 5 miles to a position abeam of the rocks north of Emerald Island. After passing Konets Head look out for a strong set from the passage north of Emerald Island. Tide rips will be seen on the 8-fathom bank, 2 miles westward of Konets Head, if the current is ebbing. Thence proceed on course 205° , with Ship Rock astern, for 3.5 miles, to position abeam of Polivnoi Rock, 1.5 miles distant. If bound southwest, the 6-fathom spot 2.5 miles 105° from Polivnoi Rock can be avoided by continuing course 205° beyond it.

Chart 8861.—Umnak Island, third largest of the Aleutian Islands, is about 65 miles by 15 miles in extreme length and breadth. On the island are reindeer, foxes, and a few head of horses and cattle. Mount Vsevidof, a volcano 6,920 feet high, is the summit of the island. It is situated southwestward of the center of the island, near the western shore, with no other mountains southwestward from it.

Chart 9021.—Tulik Volcano (Mt. Okmok), an enormous crater 7 miles across, is situated in the northern part of Umnak Island. Dense smoke may be visible from various parts of the crater.

Mount Tulik is a conical peak 4,111 feet high on the southeastern rim of the crater; another very sharp peak, 3,519 feet high, is on the opposite side of the rim.

Kettle Cape, on the southeast side of Umnak Island and at the south entrance to Umnak Pass, is a jagged

rocky ridge about 490 feet high which from certain directions resembles a kettle. It is the first prominent point west of Umnak Pass. The point is more conspicuous than its height or the configuration of the shore would indicate, as low land surrounds it.

Kettle Cape is fringed by rocks; the outer ones to the southeastward are about 0.2 mile offshore and are visible only at about low water. A large area of shoal water, 1.5 miles southeast of Kettle Cape, has a least found depth of $1\frac{1}{4}$ fathoms. This area breaks heavily in moderate southerly weather. It is marked by kelp but the kelp is difficult to see except in flat calm weather. Depths of 10 to 14 fathoms are found between this shoal and Kettle Cape. Some shelter can be found east of Kettle Cape from westerly and northerly weather.

The shore northeastward from Kettle Cape is composed of sections of sand beach backed by low, earth bluffs and gulleys from whence it rises gradually to the rim of the enormous crater of Tulik Volcano which occupies the whole northern part of Umnak Island. Outside the high-water line are several shoals and reefs.

Two miles northeastward from Kettle Cape and extending several miles northeastward, the shore is fringed by rocks extending 500 yards offshore, and comparatively shoal water—less than 10 fathoms—extends 1.3 miles offshore. Heavy tide rips, dangerous for small boats, occur in this area.

Black Rock, a flat rocky ledge 10 feet high, is 7.6 miles northeastward of Kettle Cape and 0.5 mile from shore. Depths of 12 to 20 fathoms are found 0.5 mile southward and eastward of this rock.

About 2.7 miles northeastward from Black Rock is a point with a rocky ledge extending about 350 yards northeastward; a landing can be made behind the ledge.

Otter Point is 12 miles northeastward of Kettle Cape. The intervening shoreline is featureless and Otter Point, when abreast of it, is only recognizable from the change in direction of the shoreline which turns to the northward. From the northeastward, a knoll 275 feet high, rising above a comparatively flat area just westward of Otter Point, stands out conspicuously.

Ship Rock, lying 1 mile southeastward of Otter Point, is one of the most conspicuous landmarks in the vicinity. It is an island about 500 yards long and 200 yards wide with a sharp inaccessible peak 424 feet high at its southern end. At its northern end is a lower peak ending in an abrupt bluff, giving the island its distinctive shape, but from northeast and southwest only the single higher peak is visible. The channel between Ship Rock and Umnak Island has depths of over 20 fathoms, but on account of strong currents and tide rips it should be avoided.

A bank covered 9 fathoms, on which swirls and tide rips occur, extends almost 0.5 mile eastward of the island, with deep water beyond.

Pustoi Island is flat and grassy, 68 feet high and about 500 yards in diameter. It is 0.9 mile northeastward of Otter Point. The channel between Pustoi Island and Otter Point has a depth of 8 fathoms. Deep water is close off the eastern end of the island.

From Otter Point, the shore trends northward for 2 miles, then north-northwestward for 1 mile, then north-eastward for 2 miles forming broad **Otter Bight**. Good anchorage can be found with shelter from south, west, and north, in 8 to 20 fathoms. The adjoining beach is suitable for landing except in heavy northerly weather.

A vessel could remain in Otter Bight in moderate south-east weather but not in severe storms. In approaching the anchorage, the depths shoal rapidly from 20 to 10 fathoms about when Pustoi Island comes on range with Ship Rock. Depths of 10 fathoms are found 1 mile from shore, but depths of not less than about 6 fathoms will be found 600 yards from shore.

A reef extends 400 yards from shore at a point 3 miles northward of Otter Point. One mile north of the reef highland begins and extends northward to Cape Idak.

The shore northeastward of Otter Bight to Cape Idak is composed of steep bluffs, with several rocky islets close to shore. It has no hidden dangers except very close to the land and the shore can be skirted at a distance of 0.5 mile.

Cape Idak, the northeastern point of Umnak Island, is the northern end of a long, flat ridge about 1,570 feet high, sloping gradually to the northward. From the eastward this point appears as the northern end of the island as the land to the westward is low, but Cape Tanak extends about 2.7 miles farther north.

Chart 8861.—Between Cape Idak and Cape Tanak is a flat bight. The shore of the bight is regular and lined with sand, while inland the terrain is low and grassy except in the region about 1.5 miles westward of Cape Idak, where a mountain slope terminates in bluffs near the beach. Depths of 20 to 30 fathoms are about 1 to 2 miles off the shore of the bight with the bottom shoaling gradually toward the beach.

Cape Tanak, about 7 miles west-northwestward from Cape Idak, is a low, rounding point with a number of hummocks about 50 feet high. Depths of over 100 fathoms are within 1 mile of Cape Tanak, though two narrow ledges with depths less than 100 fathoms extend into much greater depths and cause tide rips which may be mistaken for signs of shoal. Good shelter from southerly weather can be found eastward of Cape Tanak.

The flood currents, which set northeastward along either side of Umnak Island, unite in the vicinity of Cape Idak, causing tide rips. The ebb divides in the vicinity of Cape Tanak.

Ashishik Point is a narrow point about 3 miles westward of Cape Tanak. It is low and from offshore blends with the higher land in back of it. The point extends almost as far north as Cape Tanak and it should be given berth of more than 0.5 mile. Landing can be made at this point except in northerly weather and there is a good supply of water nearby.

The bight between Cape Tanak and Ashishik Point furnishes good anchorage in southerly weather. Since the prevailing winds in summer are southwesterly there are frequently long intervals when this bight is comparatively smooth.

From Ashishik Point the coast of Umnak Island trends southwestward. **Boiling Pinnacles**, with least depth of $3\frac{1}{2}$ fathoms, are about 3 miles west of Ashishik Point, with the outer end of the point in range with the outer end of Cape Tanak. The shoal is about 1.5 miles from the shore of Reindeer Point. Deep water is found outside of this shoal. It is marked by kelp, and tide rips occur to the northward of it. With the exception of this shoal, no indications of dangers have been found along the west coast of Umnak Island as far southward as Cape Kigushimkade and vessels in general may approach 1 mile off the shore.

Reindeer Point is 3 miles westward of Ashishik Point.

Cape Chagak, about 6 miles west-southwestward of Ashishik Point, is not conspicuous. On the north side of the cape there is a bold bluff rising about 200 feet. Southward of Cape Chagak the beach is about 3 miles in length and generally sandy.

Aguliuk Point is 5 miles southwestward of Cape Chagak and 4.5 miles northeastward of Cape Aslik. Northeastward of the point, for about 2 miles, the coast is broken and irregular with bluffs, sand beaches, lava outcrops, and off-lying rocks, the farthest of the latter being within 125 yards of the high waterline. Rocks lie off the lava outcrops forming the foot of Aguliuk Point, and a long, narrow edge of rocks, 100 feet high, extends breakwaterlike for 225 yards into the sea on the southern side of the point. A sand beach, beginning at this edge, extends southeastward for about 3 miles to Cape Aslik. Back of this beach, for about 3 miles, the terrain is a regular and fairly consistent slope.

Local magnetic disturbance.—Differences from normal variations of as much as 4° have been observed at Aguliuk Point.

Bogoslof Island ($53^\circ 56' N.$, $168^\circ 02' W.$) lies in the Bering Sea about 22 miles north of Cape Tanak. It is of recent volcanic formation, and eruptions have completely changed the topographic features several times. According to existing records, eruptions have occurred in 1796, 1883, 1906, 1910, and 1923–27, but it is probable that there have been other eruptions of which there are no records. It now consists of one main island and a rocky islet known as Fire Island. Bogoslof Island forms a useful landfall on a course west from Cape Cheerful.

The 500-fathom curve around Bogoslof Island approximates a circle about 5 miles in diameter.

The main island, once known as **Castle Island** because of a castle-shaped rock on it, is about 1 mile long and 0.5 mile wide, and extends in a northwesterly and southeasterly direction. The southern end terminates in a low, black sandspit which is now the haul-out place of a large number of sea lions. This point was found to shift its position during the season of 1935. On the northwest part of the island is the volcano crater of recent time from which steam emits occasionally, and adjoining the crater is a pond which is 4 feet below high water; the crater is 141 feet high. The rocky portion of the island is the home of thousands of birds.

Castle Rock on the southwest part of the main island no longer resembles a castle. Its outline is ragged and consists of two main pinnacles, 333 feet high.

Fire Island, 225 feet high, is 440 yards northwestward of the main island and practically connected with it by a rocky ledge which uncovers. It is a steep, rocky island, 220 yards long and 100 yards wide, and has three distinct summits, the middle one being square and resembling a castle. This summit is lower than the adjoining ones. A small islet, 190 feet high, adjoins Fire Island.

Fair-weather anchorage can be had on the northeast side of the island, offshore in 20 fathoms, sandy bottom, and on the northwest side of the island, 800 yards offshore, in 10 fathoms.

A current is often reported setting eastward in this vicinity; it is variously reported to set toward Cape Cheerful and toward Umnak Pass, with a velocity of 0.1 to 0.4 knot. It is inferred that with a barometric depression near Umnak Pass it sets toward Cape Cheerful, but with a depression in the Pacific Ocean southward of Unalaska Island it sets toward Umnak Pass. Vessels coming from westward often made Point Kadin ahead instead of to starboard. Maximum northwesterly currents of 1.3 knots were found on the northeast side of the island. There were also indications of a stronger easterly current on the northern side of the island. A 1-knot current, setting continuously northward for 21 hours, was observed at a location 0.5 mile west of Bogoslof Island.

Chart 9025.—The shore of **Cape Aslik** is the face of an old lava flow. It is very precipitous and irregular, with numerous covered rocks extending well offshore. Heavy kelp fringes the southern side of the cape. The cape is prominent, with vertical cliffs 60 to 150 feet high. Back of the cape, about 2 miles inland, is a conspicuous, conical hill, 865 feet high. This hill is of a dark red color, with a distinct hole in the slope on its southwest side. Farther inland, about 6 miles eastward of Cape Aslik, a distinctive peak rises to 3,310 feet. It is very ragged with deep slopes and a shoulder 600 feet lower than the summit, extending about 0.5 mile to the northwest. Between Cape Aslik and Cape Kigunak the shore is a beach of fine black sand. Back of this beach is a large, flat valley bordered by mountain ridges on the north and south, and having a lone and prominent mountain in the middle. The valley, which extends to the Pacific Ocean side of Umnak Island, is a swamp land covered with a heavy growth of grass. A large stream flows through this valley.

Cape Kigunak, about 5 miles south of Cape Aslik, is easily distinguishable and is a very prominent point on approaches from the north. It has a sharp, conical peak, 1,164 feet high, near its outer end. Its shore consists of a steep beach of boulders and broken rocks, with steep, grass slopes rising directly behind. Two rocks about 15 feet high, 300 yards off the western part of the cape, and a third rock, same height, on the low-water line show up very conspicuously. Many boulders and rocks and a band of heavy kelp extend about 400 yards offshore around the cape. The bight north of Cape Kigunak affords some

protection in southerly and easterly weather, but is not recommended in heavy weather.

Inanudak Bay, between Capes Kigunak and Imlanianuk, has depths of 10 to 40 fathoms and affords shelter except from the west and northwest. The shore of the bay is rocky and precipitous except at the heads of the several coves or bights which form part of the bay. Sand and pebble beaches are found at the heads of these coves, and low bluffs, from 5 to 20 feet high, rise abruptly from the beaches. Beyond these bluffs are flat lands or valleys.

From the westernmost point of Cape Kigunak, the shoreline curves sharply southeastward and eastward and the shore of the bay for about 2 miles is along the foot of a ridge almost straight up from the waterline. At the end of the ridge, and at the head of **Izhiga Cove**, is a sand beach which extends to Cinder Point. The water is shallow along the beach and several lines of breakers make small-boat landing difficult. Back of the beach, beyond the low bluff bordering it, is a flat valley.

Cinder Point was formed by a lava flow and is about 150 feet high near the shore, except in the middle where there is a slight draw. A cinder cone 564 feet high is near the center of the point.

Stepanof Cove, southeastward of Cinder Point, has a sandy beach about 1 mile in length at its head. Shoal water and several lines of breakers make small-boat landing difficult except on the north side of the cove where the water is usually quiet; fresh springs and seepages exist along the beach. A 70-foot pinnacle rock at the southern end of the beach is conspicuous from all parts of this cove. A low, narrow valley with steep sides extends southeastward from the head of Stepanof Cove to the Pacific Ocean side of Umnak Island. The buildings on the south side of the valley are stocked and maintained for land-air rescue work. A road extends from Stepanof Cove to Fort Glenn, about 20 miles to the eastward.

Steeple Point, forming the southern side of Stepanof Cove, has a very prominent, tall pinnacle projecting out of the side of its steep bank and numerous large rocks and boulders off its shore. The pinnacle resembles an inverted carrot and is 200 feet above the beach.

Hot Springs Cove has a mile of sand beach at its head with a small stream in the southern part. Salmon spawn in the stream about 2 miles back of the beach beneath several small waterfalls. The steam from several small, hot springs at the head of this stream can be seen from the eastern side of Inanudak Bay.

Between Hot Springs Cove and Cemetery Cove to the westward are 1.5 miles of rocky shore. Near and west of the center of this shore shoal water, marked by kelp, extends 0.4 mile offshore to the 10-fathom curve. Above the beach near the center is an overhanging cliff, 1,000 feet high. The beach in **Cemetery Cove** is rocky and bends northward toward Broken Point. Water may be obtained from a small cliff stream on the northern part of this beach.

Broken Point is not conspicuous. It has a rocky beach with deep water off the point; the 20-fathom curve is about 0.3 mile offshore.

Geyser Bight, west of Broken Point, is about 1.5 miles in depth from a line tangent to Broken Point and Cape Imlanianuk. Its beach is rounded and about 4 miles in length, with the eastern half sandy while the western half is rocky and bordered with kelp. There are 3 small rock islets 0.3 mile offshore in the center of the bight and another the same distance off the beach in the eastern part. Some protection may be found in Geyser Bight in southerly weather but it is not recommended in heavy weather.

Cape Imlanianuk, the southern entrance point of Inanudak Bay, is about 500 feet high and conspicuous. It has a rounded shore, with a number of rocks and kelp extending seaward for about 300 yards. A rock, 0.4 mile northwestward of the point is conspicuous at low tide. A shoal area extending 1.5 miles off the cape is 10 fathoms deep 0.5 mile offshore and 20 fathoms about 1 mile farther off. Ships should keep 1.5 miles off the cape.

Anchorage may be found in any part of Inanudak Bay about 0.4 mile from shore. By shifting, shelter may be obtained from all directions except the northwest. No anchorage will give protection from severe northwesterly weather. Good anchorage is available for large ships in 20 fathoms about 1.5 miles from the beaches at the heads of Stepanof Cove and Hot Springs Cove.

Stepanof Cove affords the best shelter from southeast ground to north-northwest. Anchorage may be found in 8 fathoms with Cape Kigunak just open of Cinder Point. When the wind gets around to south or southwest, this cove becomes uncomfortable.

Hot Springs Cove affords shelter in southerly and easterly weather. Cemetery Cove affords shelter except from winds from the northwest quadrant. Anchorage may be found in Izhiga Cove 0.3 mile from shore in 8 to 10 fathoms, but better shelter from northerly weather can be found in Stepanof Cove.

Chart 8861.—Between Cape Imlanianuk and Cape Kigushinkada, for nearly 13 miles, there are no dangers to navigation; ships are advised to keep 1 mile offshore in order to hold a depth of 25 fathoms or more. Kelp beds from 200 to 300 yards off the rocky areas.

The currents off the coast between Cape Imlanianuk and Cape Kigushinkada are estimated to be from 2 to 3 knots, the strongest being opposite Kshaliuk Point. The current runs northeast on the flood and southwest on the ebb.

The weather along this coast may change after passing Kshaliuk Point. When foggy, wet, windy weather prevails seaward of the point, good or comparatively clear weather may be encountered to the northeast and vice versa.

Between Cape Imlanianuk and Derby Point, for about 10 miles, the coast extends in a general southwesterly direction. A practically straight sand beach about 3 miles in length begins on the southwestern side of Cape Kigushinkada.

Derby Point is a rounded, prominent point at the northern end of the beach. This point has grassy slopes about 400 feet high, except on its northern side where it rises practically straight up and down with prominent layers of stratified rock. Southwestward of

the point, the land back of the shore is low, the beach consisting of short stretches of sand, rock, and lava formation. The most conspicuous lava flow is at **Twinlava Point**, about 4 miles southwestward of Kshaliuk Point.

Southward of Kshaliuk Point, between it and Mount Vsevidof, are three sharp prominent peaks about 2,000 feet high and about 0.5 mile apart. Less than 1 mile from the peak nearest the shore is another prominent peak of about the same elevation. It has a broad, rounded base, rising almost from the shore and has two points on the top; a low saddle connects the points.

Derby Point, about 1.5 miles southwest of Twinlava Point and 3 miles northward of Cape Kigushinkada, has cliffs and rock outcroppings along its shore. The steep sides of the point are grass covered above the cliffs, but the top is bare and strewn with cinders and small lava boulders. The rounded hill on the point resembles the crown of a derby hat when viewed from seaward, the rocky shoreline forming the brim of the hat. This point is a conspicuous feature of this coast, and also serves as a line of demarcation for different weather conditions.

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

The coast between Derby Point and Cape Kigushinkada has a southerly direction and consists of a bold, rocky cliff at the base of Mount Vsevidof.

Mount Vsevidof is an extinct volcano 6,920 feet high and the highest peak on Umnak Island. It is about halfway between Inanudak Bay and Nikolski Bay, and approximately 40 miles southwestward of Cape Idak.

The upper reaches of this mountain are usually covered with snow the year-round. The western side slopes gradually to the shore between Twinlava Point and the northern end of the large open bight south of Cape Kigushinkada.

The peak appears conical from the northwest with a slightly flattened top, but the large crater so plainly visible from the Pacific side of Umnak Island, does not show at all. The two small glaciers on the northern side of the extinct volcano are not prominent from offshore, but the valley extending inland on this same side has many bare, cinder patches and lava outcrops visible from offshore. This valley goes back toward the large, jagged, saw-toothed mountain range, 6,510 feet high, to the northeast of Mount Vsevidof.

Cape Kigushinkada is the northern point to a large open bight. This cape, at the base of Mount Vsevidof, is the outer end of a lava-flow which forms a rugged, rounded headland having precipitous, rocky bluffs, 80 to 90 feet high, with numerous jagged indentations. Many rocks and pinnacles are adjacent to the shore of this cape. The shelf on top of the cape is covered with many lava outcrops, cinder beds and fissures, and rises gradually inland to form part of the western slope of Mount Vsevidof.

On the southeast side of Cape Kigushinkada is a bold headland, prominent from seaward. A broad sand beach, about 1.5 miles south of this headland extends for about 2.5 miles south-southwestward. Behind the beach is a broad, grassy valley with three prominent streams, the

or southeasterly weather, there is no good anchorage, but in an emergency small boats might find some shelter in the eastern arm.

The eastern arm, **Traders Cove**, is more or less foul and should not be entered without local knowledge. Small boats could be hauled out on the sandy beach in the northeast corner of this arm. In this corner is a shack in which fuel and food supplies are kept for sheepherders.

Cape Udak, on the western side of Driftwood Bay, appears as a flat plateau about 600 feet high and about 1.2 miles across its seaward face. All sides of the cape are precipitous, rocky cliffs.

Black Cape, about 392 feet high, is on the eastern side of Driftwood Bay. The cape slopes gently down to the water's edge and has a group of rocky islets, about 135 feet high, 175 yards offshore.

Lookout Point is 4 miles northeastward of Black Cape. From Lookout Point for 6 miles to the point opposite Kigul Island, the shore of Umnak Island trends east-northeastward. Numerous rocky islets extend offshore for 1.5 miles. In addition to these visible objects, numerous kelp patches mark depths of 2 to 5 fathoms. The outermost of these is south of Kigul Island and has a depth of $4\frac{1}{2}$ fathoms.

Amos Bay is 8 miles northeastward of Black Cape and about 3 miles northward of Vsevidof Island. It is about 0.7 mile wide and 1 mile long in a north-south direction. The western side of the bay is bordered by reefs extending about 400 yards offshore, and the head is shoal. Anchorage with shelter from northeast to west can be found 0.3 mile west of the eastern entrance point, in 7 fathoms.

To approach this anchorage, from a position 0.8 mile west of Vsevidof Island steer 000° for 3.5 miles, passing 0.4 mile westward of a rocky islet lying 1 mile south of the eastern entrance point. Favor the eastern shore of the bay to avoid the reefs bordering the western shore. A trail leads from the head of the bay to Nikolski on the west coast. On the east side of the bay is a cabin in which food and fuel are kept for sheepherders.

Vsevidof Island, 280 feet high and about 1 mile across, is the largest of the group of islands on the southeastern side of Umnak Island and is southeastward of Mount Vsevidof. A small bay indents the southern shore of Vsevidof Island. Covered rocks at the entrance prevent anything larger than a small launch from entering and then only when no surf is running. Rocks extend south-eastward 0.4 mile from the southeast point of the island, terminating in a rocky islet about 30 feet high. Depths of more than 20 fathoms are 0.3 mile eastward of these rocks.

Ogchul Island, 1.7 miles eastward of Vsevidof Island, is about 0.3 mile across, 180 feet high, and is surrounded by deep water. The island is flat topped. The channel between the two islands has depths of 35 fathoms or more.

Kigul Island, 3.5 miles northward of Vsevidof Island and about 2 miles eastward of Amos Bay, is the largest of the inshore islands. It is about 0.5 mile in diameter and 219 feet high. The island lies 0.5 mile off the coast

of Umnak Island, and the channel in the passage between the island and the coast is restricted by shoals to a width of about 150 yards. Northward of Kigul Island, anchorage with shelter from southerly and westerly winds can be found in about 12 fathoms. Anchorage with shelter from easterly winds can be found westward of the island in 7 fathoms. The approach to this anchorage is difficult without local knowledge.

Lone Rock, 1.5 miles northeastward from Kigul Island and 42 feet high, is the northernmost of the group of rocks and islets in this vicinity.

Russian Bay, near the middle of the Pacific Ocean side of Umnak Island, is about 1 mile wide and 2 miles long. A rocky ledge, 16 feet high, lies about 1 mile east of the southern entrance point. This ledge should be given a wide berth to the southwest to avoid a rock that uncovers 425 yards southwestward of the ledge. The point on the northeast side of the entrance should also be given a wide berth to avoid the foul area extending southwestward of the point for about 0.3 mile. At the head of Russian Bay is a sandy beach where a stream of considerable size flows into the bay. This bay offers protection from northerly weather in 10 fathoms, sandy bottom. In southeasterly weather the bay is not recommended except in an emergency.

The Pillars are a pair of pinnacle rocks, the larger 130 feet high, about 3 miles off the shore of Umnak Island and 15 miles northeastward from Vsevidof Island. These rocks stand out prominently from all directions and may be seen many miles on clear days. From the north and south they have the appearance of a single pinnacle. From the east both rocks are visible. A rock awash at high water lies about 175 yards eastward of The Pillars. Depths of more than 14 fathoms can be carried to within 0.3 mile all around these rocks.

Thumb Point, about 3 miles west of The Pillars, is a long, narrow point, on the tip of which are three large pinnacles. Two of these, about 150 feet high, are on the beach. The third, 121 feet high, lies about 150 yards offshore. From distances less than 5 miles these three pinnacles are very distinct; though several others of like size are in the vicinity, these cannot be mistaken, there being no other group of three.

The broad bight between Thumb Point and Kettle Cape is fringed by off-lying ledges. Two valleys lead across Umnak Island toward Inanudak Bay from the head of this bight.

Chart 9030.—Islands of Four Mountains are a group of five, treeless, volcanic islands lying westward of Umnak Island. Their names are Ullaga, Kagamil, Chuginadak, Carlisle, and Herbert. The group is about 16 miles from Samalga Island and about 18 by 25 miles in extent.

These islands are high and snowcapped, with some snow remaining throughout the year. Clouds obscure the peaks most of the time. Frequently in the summer, while low fog banks lie over the adjacent waters, the peaks stand clear above and are visible away from the fog banks. Fog is often in patches that may be avoided by passing around one of the islands, or by moving out

of the sweep of wind through a pass. The winds play about the islands with all the vagaries common to williwaws and may sometimes be avoided by making a move of a mile or so.

Navigation among the islands is beset by frequent fogs, strong and treacherous currents, and tide rips which may be dangerous for small craft. Because of the frequent fogs and strong currents it is emphasized that navigation is safe only by frequent sounding and constant reference to the chart. All waters are clear for large ships beyond about 1 mile from the shores, and for small craft beyond 0.25 mile except where obstructions are charted. It is not safe to attempt passage inside any of the off-lying rocks.

In Samalga Pass, between Samalga Island and the Four Mountains Group, the waters are deep and 15 miles in width; however, a good berth must be given the shoals extending southwestward from Samalga Island.

A bank, with a minimum depth of 13 fathoms, is about 5.5 miles southward of Concord Point, Chuginadak Island. Apparently it is the high spot of a large shoal area rather than a pinnacle.

Among the group, the passes are probably all clear, though they have not been swept with wire drags.

It is strongly recommended that a vessel proceeding along the north side of the Aleutian Islands avoid anchorage in the Four Mountains Group in bad weather. With heavy sea running in the Bering Sea, dangerous tide rips will be encountered among the islands, and any lee backed by indentations on the islands' shores is offset by the sudden shifting of the wind which may necessitate shifting anchorage during thick fog through narrow passes subject to strong tide rips.

Uliaga Pass, between Uliaga and Kagamil Islands, has 28 fathoms across almost its entire width, and a midchannel clears all known dangers. In the middle of the pass is a light growth of kelp; it is towed under and difficult to see except during the periods of slack water.

Kagamil Pass, between Kagamil and Chuginadak Islands, is wide and clear; no obstructions northwestward of Corwin Rock. The least depth in the pass is 7 fathoms, 5 miles north of Chuginadak Island.

Carlisle Pass, between Chuginadak and Carlisle Islands, a midchannel course will carry 28 to 32 fathoms, the shoalest part. The depths increase quickly to 40 and 90 fathoms at both ends of the narrowest part of the pass. On either side of midchannel the water shoals rapidly toward land, but no danger exists until about 1 mile from the shoreline. The currents in this channel are strong and the rips and swirls are of moderate intensity. Small boats should avoid the center of the channel, the worst of these.

Chuginadak Pass, between Chuginadak and Herbert Islands, is about 3 miles wide, with depths of more than 100 fathoms.

Between Herbert Island and Yunaska Island, to the east of the Four Mountains Group, the passage is 10 miles wide and very deep.

Observations among the Islands of Four Mountains have not been sufficiently detailed to serve as a basis

for precise predictions. The best index to the times of flood and ebb appears to be the information for a location 1 mile east of Yunaska Island which is given in the Tidal Current Tables. Flood sets generally northward and ebb southward. The duration of slack is usually very short.

Among the islands the water swirls and counters in a highly confused manner, so that rips and eddies may be encountered almost at random. Rips in some cases indicate bottom configurations, but often not. Particularly in bights along the shores, currents counter to those outside may be anticipated.

Strong tidal currents set through all the passes. Velocities exceeding 4 knots have been noted and it is probable that they reach 5 and 6 knots at times. Heavy tide rips may be anticipated except at slack water. In Uliaga Pass and in Carlisle Pass, the flood sets northeasterly. Between Herbert Island and Chuginadak Island flood is to the northwest. In Kagamil Pass the currents are confused and the flood appears to enter the passage from the east, passing to the northwest to mingle with the flood current from Carlisle Pass, and thence turns northward along the west side of Kagamil Island. South of Chuginadak Island considerable differences in the direction and strength of the current over short distances may be noticed. Heavy rips, except in calm weather and at slack water, are located about 1.5 miles southeastward of Concord Point, the southeastern point of Chuginadak Island. Current boils have been noted as far as 7 miles offshore. Inshore, the set appears to be to the eastward most of the time. Offshore, about the 500- to 1,000-fathom curves, it seems to be principally to the westward.

Anchorage in the group of Four Mountains Islands are few and inadequate. The principal one is in Applegate Cove, a bight on the north shore of Chuginadak Island. Protection from northerly weather may be found in South Cove on the opposite side of this island from Applegate Cove. About 3.5 miles to the eastward of South Cove is another anchorage, of small extent but offering excellent protection from the north. An anchorage giving protection from southwesterly to northwesterly weather is available in the bight at the northeast corner of Chuginadak Island, about 0.9 mile south of Corwin Rock.

A fair anchorage for medium-sized craft is in a cove on the north side of Kagamil Island. Another anchorage is located in a bight on the southern side of the extreme east end of Kagamil Island.

No other anchorages about these islands can be recommended and none around Carlisle and Herbert Islands. Small craft may find bights here and there where the depths and swinging room are suitable for anchoring, but the prevalence of strong currents, heavy seas, and bad wind conditions make them unsafe. The bottom in and around this group of islands, where it is not rocky, is essentially cinders and volcanic ash mixed with sand and gravel.

Uliaga Island, the northernmost and smallest of the Four Mountains Group, consists of one central mountain cone with a few prominent spurs. On the slopes are several spirelike rocks. The crest of the peak, 2,910 feet

high, has two points, one sharp and the other flat, larger, and slightly lower. The northwest side of the mountain is very steep and is greatly eroded. A serrated ridge protrudes from the south side of the mountain, and the southern one of three peaks on this ridge is a good landmark.

The cove on the north end of the island is filled with kelp and affords poor protection for small boats. The eastern side of this cove is a cape, formed by a rough, lava outcrop, with a sharp, narrow ridge leading down to it. The western side of the cove is a wall of rock 340 feet high. The largest stream is on the western side of the island. A sharp, needlelike pinnacle with two points, the higher 65 feet, lies less than 0.5 mile from the northwestern shore and about 1.1 miles north of the westernmost point of the island. This point is comparatively long and consists of a narrow ribbon of lava extending into the sea from one of the mountain ridges. On the south slope of this ridge and about 0.8 mile eastward of the westernmost point of the island is a sharp spur, 956 feet high.

A rock, which uncovers 3 feet, is about 0.2 mile from the eastern shore of the island and well outside the thick kelp line. The best landing site on the island is on the eastern side about 0.5 mile from the southeastern corner. This landing is on a boulder beach behind a barrier of kelp and near a trapper's cabin, which is occupied during some winters. A prominent scar is in the low, grass bluff bordering the shore in this vicinity. The small cove southward of the landing is marked by a 40-foot pinnacle rock at the south end of a boulder beach.

Kagamil Island, between Ullaga and Chuginadak Islands, has a large mountain in the center of its southern half. The mountain is 2,020 feet high, and has a circular crater on its northwest side. Its upper slopes are steep and rocky, while those nearing the base make a somewhat abrupt change to large, gently sloping or flat areas of grass or tundra which generally terminate in bluffs. Near the southeast end of the island a number of fumaroles emit vapor near the tops of the cliffs, and at the southern end is a strong steam jet in the cliff a few feet above the sea.

The hills in the northern part of the island culminate in a 1,640-foot peak, which is close to the northern shore. The two largest valleys are on the east side of the island; the northernmost is quite flat, with some grass-covered bluffs, and is drained by two small streams. What is probably the best camp site on the island is located in the valley at the head of **North Cove**, the largest of the coves on the northern shore. This valley, circular in shape, and the smallest on the island, has one permanent stream. **North Cove** has the only sand beach on the island.

Candlestick Point, on the western side of **North Cove**, has striking topographic features in a long, thin wall of rock with a 75-foot arch to form the point proper, and a group of 10 tall pinnacles close by. The wall of rock is 315 feet high and juts out northward into the sea. The pinnacles, the tallest being 156 feet, are grouped slightly offshore about the outer end of the wall. The northwestern point of the island is a detached spur, 591 feet high, with a conspicuous smooth, red cliff, located about 0.3 mile westward of **Candlestick Point**.

From the red cliff the coastline trends southward. High cliffs with a series of gray pinnacles border the shore. Southward of these cliffs, the only valley on the west side of the island begins at the head of a small cove. This valley is narrow, about 2 miles in length, and is drained by the largest stream on the island. A small lake is reported to exist in this valley. To the southward, the cliffs along the shore rise almost vertically from the sea 300 to 500 feet, with no talus or ledge at the waterline. The cliffs at the southeast end of the island are broken in many places by caves. The shore around the southern end of the island is of very rough lava and boulders, the lava being most prominent at the southwest corner of the island.

A fair anchorage for medium-sized craft in 10 fathoms, rocky bottom, is on the northern shore of **Kagamil Island** in **North Cove**. It is subject, however, to violent williwaws. Fresh water may be found in the cove. Entrance is from due north of the center of the cove and well clear of the vicinity of the pinnacles on the west side. Another anchorage may be found in 18 fathoms in a bight just south of the easternmost end of the island. The bottom is reported to be coarse, black sand and fine gravel. This bight is marked by a high ridge, extending east from the mountains, and a gablelike headland. There are a stream and a cabin in the bight. Williwaws may be encountered here, and the currents are troublesome; nevertheless good shelter from westerly weather may be had.

Chuginadak Island, the largest of the **Four Mountains Group**, consists of two mountain masses divided by a low, wind-swept valley across a narrow neck of land. The low area of the valley contains rolling grassland interspersed with areas of lava flow, cinder patches, and conical cinder hills.

The eastern part of the island is an area of rugged terrain formed by a group of eroded volcanic peaks, the highest being 3,840 feet. Numerous valleys and ridges descend to the rocky bluffs bordering the shore. The peaks, almost constantly hidden by clouds, are covered with snow nearly the year round. The lower levels have a vegetation of thick grass, while the higher altitudes are of barren rocks and lava ash. Many prominent waterfalls may be seen around this part of the island. In about the middle of the east coast are several areas where steam escapes from the top of the shoreline cliffs. On the south side, **Concord Point**, the southeast end of **Chuginadak Island**, is a high headland of rolling, grassy hills. Immediately to the northwestward of this headland, **Black Peak**, the remnant of a large crater, the west rim of which is a distinctive black crag, is a conspicuous landmark from the southeast and southwest. It is 1,525 feet high, and is usually visible when the higher peaks inland are hidden by clouds.

The coastline of the eastern part of the island is indented by many coves and bights. Extensive kelp beds are found in the shoal areas and numerous large boulders and off-lying rocks along the shore. **Corwin Rock**, 56 feet high, stands prominently at the extremity of a submerged reef making out from the northeastern shore of the island. The outer limits of **Corwin Rock** are within about 0.7 mile

from the nearest point of Chuginadak Island. Although this rock appears as a single island, it consists of two small islets, separated by a small, narrow strait. On the southwest side of Corwin Rock the kelp extends well out toward the shore of the island. Currents, swirls, and tide 5
rips indicate foul waters, and no passage exists between the rock and the island.

The western part of Chuginadak Island consists of a tall, symmetrical cone, known as **Mount Cleveland**, 5,680 feet high. The sides of this volcano are streaked by 10
series of lava flows, with intervening, grassy patches on the slopes, most of these patches being on the south side. Because of the heat of its active crater, Mount Cleveland loses its snow more rapidly than the other high peaks. A wisp of smoke or vapor issues most of the time from the 15
small crater in the top of Mount Cleveland; a dim glow may be seen at night. An unusual condition consisting of a clear patch of sky in the lee of the volcano has been observed when all other places were heavily overcast. No waterfalls are on this part of the island and there may 20
be fresh water only after a rainfall, as the entire cone is apparently so porous that no stream of water from the melting snow reaches the shore. The coastline is more regular than around the eastern part of the island, and the kelp beds bordering the shores are less extensive. A 25
few rocks awash are found close inshore along most of the beaches and cliffs.

There are no good places to land on the island in unfavorable weather. However, in moderate weather land- 30
ings may be made in some of the smaller coves indenting the point on the northeast side of Applegate Cove. It is generally possible to land on the south side of the island in South Cove. The landing is on the eastern side of the cove, at the end of the sand beach or on the adjacent, rocky shore. The best place for a small boat to 35
obtain water is in a small cove about 1 mile eastward of the landing, near a waterfall with a peculiar white deposit at the top. This deposit can be seen 20 miles offshore on clear days. A small boat can pass inside the 40-foot pinnacle near this waterfall.

The houses are on the island but a large shallow cave on the face of the cliff at the head of South Cove. With the exception of Corwin Rock no dangers are located very 45
offshore, the farthest being about 500 yards away. Rocks awash, and others bare at low water extend about 50 yards from the shore of the southeastern side of Concord Point. A $1\frac{1}{4}$ -fathom spot is 0.3 mile off the 50
end of the point. The kelp around the island is always visible due to the strong currents.

The anchorages in Applegate Cove, the largest bight on 50
the north shore of Chuginadak Island, and in South Cove on the opposite side of the narrow neck of land have the most unfavorable weather condition. The fog hangs heavily over them when the two main parts of the island are comparatively clear.

Applegate Cove affords protection from all weather except from the northwest to northeast. However, winds of great intensity are almost constantly encountered. The valley across the narrow neck in the center of the 60
island acts as a draw, causing the winds to be of much

greater intensity than would be normally expected. Wind forces double those prevailing outside may be encountered in stormy weather. Bottom is of dark-colored sand and mud, but rocky patches may be found. The bottom holds 5
fairly well in moderate weather but dragging may be expected during severe blows. Anchorage may be found in the center of the cove in 14 to 20 fathoms. Small craft should anchor well into the cove in 7 to 9 fathoms, from 600 to 800 yards offshore opposite the central part of the sand beach. Both the wind and fog may be avoided to some slight extent by anchoring near the western part of the cove, opposite a prominent, dark, rocky outcrop in the bluff.

An anchorage with good protection from the northwest to southwest, is available in a bight about 0.9 mile south of Corwin Rock in about 14 fathoms, rocky bottom.

Protection from northerly weather may be found in South Cove, the large cove on the south side of the valley between the two mountain masses. Conditions regarding fog and wind correspond exactly with those of Applegate Cove. South Cove is smaller and has a shoal in the western part. The bottom is rocky and anchors may be fouled. The best anchorage is in 9 fathoms northeastward from the shoal and it can be approached from the south- 25
east to southwest bearing in mind the shoal in the western part. The nearest source of fresh water is on the exposed coast, about 1.5 miles eastward, where small boats may obtain it in favorable weather.

A small anchorage in a bight about 3.5 miles eastward of South Cove and 3 miles northwestward of Concord Point gives excellent protection from northerly winds. Because of the shielding effect of high cliffs, it may be free from fog when South Cove is not. Several waterfalls mark this bight. Anchorage is in 15 fathoms, with rocky 35
bottom and very limited swinging room.

Carlisle Island, about 1.2 miles northwest of Chuginadak Island, is a mountain consisting of a single, extinct volcanic cone 5,280 feet high. The island is somewhat circular in shape, with a diameter of about 4 miles. The 40
upper part of the mountain is snow covered. Below the snow line, the slopes are dark lava, while below 1,500 feet they are covered with grass or tundra. The lower slopes flatten out and generally terminate in rocky cliffs or steep bluffs. On the west and north sides are numerous seepages on the face of the bluffs. The westernmost point of the island is an almost flat, oblong plateau 1,000 by 1,400 yards, with an average elevation of about 100 feet. The only stream on the island that may be flowing continuously is on the southeast side about 1 mile southward of a shack. 50

The most prominent features along the shore are: on the northeast side of the island, a small peninsula 0.4 mile long, formed by a lava-flow jutting out northeastward into the sea; on the southeast side, a knoll forming a rocky 55
point; on the south, a peculiar, dragon-shaped, rock dike protrudes in the shape of a curving ridge and headland at the extremity forming **Dragon Point**; off the northwestern point, a rock has the appearance of a partly submerged ship when viewed from the east. Also a low, offshore rock is in this vicinity.

Herbert Island, the southwesternmost of the Four Mountains Islands, is separated from Chuginadak Island by 3-mile wide Chuginadak Pass. The mountain on the island may be likened to a truncated cone, the truncated section being the rim of a crater about 1 mile in diameter. The rim is lower on the northern side, and from well offshore to the northward the inside of the crater is partly visible. The highest part of the island, 4,235 feet, is the southern rim of the crater. The northern side of Herbert Island appears fairly flat when approached from the east or west. The northern side of the mountain is deeply eroded and the most abrupt. The south and west sides of the island are marked by yellow scars on the cliffs. The island is tundra- and grass-covered, with snow from fall to early summer. The lower slopes are regular and in places gentle.

Along the west part of the northern side of the island is a low bluff, less than 50 feet high, which gives way on the east side to high, sheer bluffs of from 200 to 400 feet. Under these high bluffs, the shoreline is mainly a boulder beach, 10 to 20 yards wide, with kelp offshore. On the flat part of the northern end, however, the beach is fairly wide, and reefs, with many rocks awash, extend well offshore, and beds of heavy kelp for some distance outside the reef and foul area line.

Eastward of the northernmost point of the island is a shallow bight which may be used for anchorage in calm weather, though it has a boulder bottom and in southerly weather is subject to heavy seas coming from the southward around the northeast corner of the island. Strong currents tend to form tide rips with any sea that might be running. A cabin, at the northwest end of the bight, is occupied at frequent intervals by fox trappers.

On the west side of the island, near the southwest corner, is a cup-shaped valley, apparently the eroded remains of a crater. The shore at the foot of this valley is a boulder beach with moderate slopes behind it. Northwestward of the valley, and about 0.5 mile offshore, is a 60-foot rock which stands out very prominently from both north and south. A small rock lies about halfway between it and the shore.

The south shore of the island consists of narrow beaches at the foot of cliffs of varying heights. All offshore rocks are within 200 yards of this shore except off the southeast corner of the island, where a prominent pinnacle rock 135 feet high is about 0.3 mile off the beach. The passage inside this rock is not clear, due to a rock awash, and another 2 feet high. Back of the pinnacle rock is a distinctive reddish headland.

Chart 8861.—Yunaska, Amukta, and Chagulak Islands are a group of islands located west-southwestward of the Islands of Four Mountains. Yunaska, the nearest, is about 14 miles from Herbert Island while Chagulak and Amukta Islands, lying about 3 miles apart, are about 10 and 14 miles, respectively, to the westward of Yunaska. The pass between Herbert and Yunaska Islands and the pass to the westward of the latter are deep and clear of dangers. Navigation about these islands requires caution and frequent soundings during poor visibility.

Current observations taken 1 mile east of Yunaska Island indicate velocities of about 2 knots. The greatest velocity observed was nearly 4 knots. The flood sets northward and the ebb southward. Current predictions for this location may be obtained from the Tidal Current Tables. The velocity of the current changes very rapidly around the times of slack water, and the current frequently runs near its maximum flood or ebb velocity for 4 or more hours. Strong currents and dangerous tide rips are reported in the vicinity of Amukta and Chagulak Islands. In a small gale and during spring tides, the tide rips are built up by an opposing swell. A strong ebb against a small swell is reported to cause 10-foot rips in a dead calm. Currents opposing the swell and a little wind may bring about such seas and rips that small vessels are forced to proceed slowly.

Yunaska Island is a treeless volcanic island, divided into two parts by a generally flat valley, with gentle slopes from the bluff back of the shoreline to the base of the mountains. The island is mostly grass covered below 1,000 feet, especially in the lower flats where the grass is extremely thick and matted. Weather conditions are similar to those of the Islands of Four Mountains. Yunaska is a wildlife refuge; it has been stocked with blue foxes which are now quite plentiful and tame. Two cabins are located on the island. In general, the landing facilities are poor and there are not many sources of drinking water.

A large crater, about 2 miles in its greatest diameter, is in the eastern portion of the island. The highest point of the crater's rim, 1,068 feet, is found on the northwest side. This point appears as a lone peak from some directions. The crater is surrounded by various conical and ridgelike hills, interspersed with small craters and lava flows. Within the large crater is a small peak, 1,804 feet high, which has its own small crater. Eruptions in this part of the island have been known to occur. A prominent lava flow extends from the southwest rim for about 1 mile to the south; it does not reach the shore. The cliffs along the south shore of this part of the island are honeycombed with caves and marked with many bridges and arches.

Near the northeastern shore of Yunaska Island is a prominent saddle-shaped peak, 1,051 to 1,066 feet high. A bold promontory, 747 feet high, adjacent to the shore, is at the end of a ridge leading northwestward from the saddle-shaped peak. To the west of this ridge and north of the crater is a broad, smooth valley. The surface is composed of porous ash covered with a moderate growth of grass. The entire area is well drained by a few narrow ditches 4 to 6 feet deep. Through the middle of the valley is a long lava flow, about 20 feet high and very rough. The lava flow extends north-northeastward to the shore where it spreads along the water's edge and where, under favorable conditions, landing might be made. A good supply of drinking water can be obtained from an underground stream about 150 yards east of and behind the westernmost corner of the lava flow. The stream flows below and around the boulders of the old beach.

Along the east and north coast of this part of the island the shore is bordered, in general, by steep rocky cliffs

which can be scaled in several places. The most important break in the cliffs is at the foot of the lava flow. **East Cove** is a broad indentation on the extreme eastern end of the island. Landing sites are found in East Cove and at the head of a bight north of East Cove where some water can be obtained.

The central valley of the island is composed of flats occasionally broken by hills and knolls, and is covered with tundra. No dependable permanent source of drinking water has been found in this valley.

On the western portion of the island is the highest peak, 8,119 feet. It is an apparently lifeless volcano, somewhat eroded, with remnants of craters on its side and about its base. From the west, the island appears as having grass-covered hills, with high bluffs on the north and south rising abruptly toward the summit of the two-pointed peak. The points stand out, particularly from the westward, when they are not covered by clouds, which is seldom.

A low bluff extends along most of the western coastline. North and south of it much higher bluffs begin and rise 800 to 600 feet in places. A 300-foot bluff, beginning about 1 mile from the northwest corner of the island, extends southward for about 0.5 mile. A black sand beach, about 40 yards wide and 600 yards long, is at the foot of the southern half of this bluff.

With the exception of this short stretch of sand beach, the western shore is rugged and has many reefs and rocks awash offshore. Many lava points extend outward from the general bluffline. The kelp is thick and extends from 50 to 200 yards outside the rocks. On the northern and southern ends of this shore, where the bluffline is higher, the beachline becomes a narrow, boulder shelf at the foot of the bluff, the boulders extending out into the water for some distance. A large reef extends offshore for over 300 yards from the southwestern point of the island. On the eastern side of the bold southernmost point of the island, for a short distance the cliffs drop immediately into the water without even a shelf at their foot. Several large offshore rocks exist in this locality. A large pinnacle, about 200 feet high, is about 150 yards offshore and about 2 miles northeastward from this point of the island.

The shoreline around the island is rugged and has many off-lying rocks and pinnacles. Heavy kelp extends several hundred yards offshore, except off the sand beach in the middle of the southern shore of the island and a few other places where there is deep water off vertical, lava cliffs. Heavy tide rips and strong currents are encountered off many points, especially those at the northeast and southwest ends of the island. All around the island the bottom breaks off fairly sharp, becoming more even as the 30-fathom curve is approached. Passing ships are advised to go outside this curve.

Dangerous shoals extend off the eastern shore of the island and in the vicinity of an off-lying rock and on the northern side of the island in South Anchorage.

Ships should not approach within 1.5 miles of the island's shore except with extreme caution. Small craft consider themselves safe at distances beyond 0.3 mile from shore, except where charted obstructions exist. A

pinnacle rock 91 feet high lies off the southeast shore.

Around Yunaska Island are three or four fair anchorages. **South Anchorage**, the largest bight on the south side of the island, affords protection from northerly as well as westerly weather, and to some extent also from the northeast, in 13 to 15 fathoms with even bottom of rocks and cinders. The off-lying reef and low rocks in the western part of the bight must be avoided, as well as the shoal in the eastern part. A safe entrance may be made by heading for the middle of the long, conspicuous black cinder bluff along the head of the bight on a course 000°. A tall shaft of rock, leaning slightly, is on the steep slope at the western end off the bight.

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

East Cove, indenting the east side of the island, affords fair anchorage, for one ship, in about 10 fathoms with good holding ground of cinders and mud. The cove is small, with a dangerous off-lying ledge and rocks on the south side, and with troublesome currents. It affords fairly good protection from westerly weather; however, it is subject to violent williwaws during westerly storms, making it inadvisable to anchor there. Heavy swells reach this anchorage during southwesterly storms. Launches may find good protection inside the kelp behind the rock reef in the south side of the cove.

Protection may be found by small craft in a small but pronounced cove near the middle of the west shore of Yunaska Island, in 52°38' N., in about 3 fathoms, with a bottom of boulders. A narrow channel, about 100 yards wide, leads through the heavy kelp to the head of the cove.

The best protection from southerly weather is found in a small cove on the north shore of the island in 170°41.5' W., in about 16 fathoms, with rock and mud bottom. A 6-fathom depth is at the east end of the cove. About 0.5 mile to the westward is a smaller cove, where launches may find good protection from southerly weather in 3 fathoms, sandy bottom. A cabin is at the top of the high black bluff at the head of this cove.

Crater Anchorage, a bight on the west side of the island, affords fair anchorage with some protection from easterly and southerly weather in 18 to 20 fathoms, cinder bottom. The bight is marked by a curved black bluff on its eastern side, the remnant of a crater. Rocks, covered 7 feet, are encountered a very short distance inside 15 fathoms in 170°46' W. which constitute a serious danger in this anchorage.

Chagulak Island is a steep, volcanic mountain having a sharp peak 3,750 feet high. Its rugged slopes, mainly a series of sharp, steep-descending rocky ridges marked by numerous pinnacles, terminate generally in rocky cliffs at or near the shore. It is uninhabited and has no good landing places. The island is steep-to on all sides and soundings give little indication of danger. It should be given a clearance of at least 1 mile. The cove on the west side formed by the southwest point offers some protection and a possible landing for small craft during southeast weather; its approach, however, is endangered by violent tide rips.

Great caution should be exercised during thick weather while navigating in the vicinity of Chagulak Island. Very strong currents make it impracticable to use soundings as a guide in thick weather. The 200-fathom curve lies dangerously close in places, barring the use of depth curves for rounding the island. There are no recommend ship anchorages near Chagulak. The island is small, steep-to, and affords no protection. The two principal exceptions to the general steepness of the slopes of the ridges are at the southwestern and southeastern points of the island.

The southwestern point is a peninsula formed by a comparatively long and flat, grass-covered ridge some 300 feet high, and the upward continuation of the ridge toward the mountain summit which has a comparatively regular and moderate slope. By reason of its low elevation, the peninsula is generally not fog- or cloud-covered during the prevailing low visibility. A slight, rounded rise near the shoulder of the ridge at the northwest extremity of the peninsula, and another on the south side of the peninsula, are distinctive as they alone project above the smooth appearing tabletop of the ridge. On the south face of the peninsula below the second rounded rise is a small white scar in the shore bluff.

The southeastern point is the extremity of a moderately descending grass-covered ridge projecting seaward to form a peninsula. The rounded northeast end of the island above the rocky cliffs along the shore is grass-covered and also has a fairly moderate slope.

On the north part of Chagulak Island, about halfway in distance and elevation along the ridge between the summit and northernmost point, is a pronounced saddle. On the northern end of this saddle is a summit, with a pinnacle, 1,905 feet high. A second smaller and lower pinnacle is just to the northward. From these pinnacles the ridge slopes in a general convex form to the northern point of the island. On the next prominent descending ridge to eastward, is a rounded thumblike protrusion, 1,120 feet high, which is visible along the line of the northeast tangent of the island. A similar thumb, 1,495 feet high, is on the western descending ridge, which forms the southern boundary of a deep valley on the west side of the island. It is seen along the line of the southwest tangent of the island and particularly well when snow is in the locality, as the steep sides of the feature itself are generally bare.

Chagulak Island is a nesting place for whalebirds and small gulls which fly in great numbers around the island within a radius of a few miles, and in foggy weather may indicate the proximity of the island.

The shore is either of large boulders, vertical cliffs, or outcropping rock. There are several off-lying features. Off the northwest side are two prominent rock ledges; the inshore ledge is 55 feet high. Off the east side is a small rocky islet, steep and roughly rounded in outline at the top and 150 feet high. About 0.6 mile to the northward of the rocky islet and farther offshore is a very dangerous detached ledge, since it shows only a few feet above the surface and seas sweep over it in moderate weather. Several rocky islets are off the south shore and there is a low, rocky ledge off the southwestern point.

On the south shore is a prominent, smooth, narrow slide of snow and sediment which may be distinguished well out at sea.

On the west side is a 225-foot pinnacle rock. A beach landing may be made on the south side of the pinnacle. About 400 yards north of the pinnacle is a 20-foot dike that extends about 20 yards outside the high water line. Many rocks awash and covered, are off the point 250 yards north of the dike.

The northern shore is very rugged, with precipitous rocky bluffs. In general, the kelp near the shores is thickest along the western shore.

A submerged pinnacle having only 2 fathoms over it lies just within the 100-fathom curve, 0.5 mile northwestward from the southwestern point. In this vicinity are strong, erratic currents and heavy tide rips.

The small, rocky islet close to the southern side of the peninsula at the southwestern point affords some protection for making a landing on the island. The cove on the north side of the peninsula affords anchorage for small craft in southerly and easterly weather.

Chagulak Pass is clear except for the 2-fathom shoal mentioned in the description of Chagulak Island. It is about 3 miles wide but passage should be attempted only with local knowledge or during very clear weather. The flood current sets northwesterly and the ebb southeasterly. The current is probably in excess of 3 knots. Tide rips were noted through the entire pass.

Amukta Island has a volcanic mountain cone with a crater at the summit. The highest point of the rim of the crater is 3,463 feet at its western end. On its southern end is an appreciable depression of the rim. The mountain is closest to the northern shore of the island, where its slopes descend directly to the shore. The base of the mountain cone proper is at about the 1,000-foot level, and to the east and west the lower slopes reform into spurs, hills, and ridges.

Near the northeastern shore a prominent, cinder hill, 1,486 feet high rises at the side of the cone.

A group of fingerlike pinnacles mark approximately the flattened, 1,000-foot level which appears as a ridge bordering the eastern shore. This apparent ridge descends to the southward and is linked with the prominent ridge forming the peninsula at the southeast end of the island, a low saddle lying between them. Rising on the slopes of the mountain halfway between its summit and the southeast peninsula is a group of reddish knolls. A spur projecting from the mountain toward the northwestern shore is marked by two summits, the inner and higher one being a conical peak 1,036 feet high.

A ridge of varying elevation borders practically the entire west coast and terminates in the peninsula forming the southwest end of the island. On this ridge are some distinctive summits and a decided break occurs about halfway along the western shore. The eastern slopes of the southern part of this ridge border the large cove indenting the south side of the island and the adjacent low lava fields.

A very distinctive feature on the island is a massive, rectangular outcrop of rock, crowning one of the sum-

mits of the peninsula ridge at the southeast end. This 615-foot-high block-shaped landmark is the highest part of the ridge. Another massive outcrop of rock, peaked in shape, appears on the summit to the northward. These remarkable features are dark, in contrast to the grassy surface of the remaining part of the ridge, and may sometimes be recognized well to seaward against the 3-mile distant mountain background of the island.

Amukta Island is generally covered with lava and cinders, and is black in general appearance. However, some grassy areas are on the ridges along the west side of the island, in the area to the south of the cone, and on the ridge forming the southeast peninsula.

During low visibility the southwest peninsula of the island may be recognized by a 130-foot rock detached from the headland at its southern extremity; it appears as a pointed shaft of rock when viewed from the northwest and the southeast sectors. Against a shore background, the rock is not discernible at a distance.

High Rock, off the deep cove indenting the south side of Amukta Island, is a prominent landmark. It appears as a columnar monument rising 68 feet from a rocky ledge base. The top of the column is a smooth, truncated surface facing seaward and with favorable light, has a light-gray appearance, making it partly discernible from offshore against the island background.

The easternmost point of Amukta Island is formed by a projecting ledge, and directly off the ledge is a rocky islet, the inshore side of which rises vertically to 65 feet. In this locality the shore rises abruptly in steps and thence to a jagged, ascending ridge. A prominent rock pinnacle on the ridge about 200 feet above the water level is about 300 yards from the point.

The northeast shore of Amukta Island bordering Chaguluk Pass is in general composed of lava bluffs or large boulder beaches. Along this shore are many detached rocks. A good landing place is in the small bight about 1 mile southeast from the northernmost point of the island. A temporary small-boat anchorage and landing may be found in the small and deeply indented bight around the east side of the northernmost point.

The western shore of the island is composed of high cliffs meeting the slopes of the nearby ridges.

A trapper's cabin is on the shore of the bight on the north side of the island; some water is available in this locality.

Almost the entire coast of Amukta Island is fringed by detached rocks and ledges of various description. On the southern coast of the island an area of broken bottom extends from the southwest peninsula for over 1.5 miles in a southeasterly direction; High Rock lies in and near the middle of this area. The section between High Rock and the peninsula is extremely foul and passage there it should not be attempted. The outlying section of a depth of $8\frac{1}{2}$ fathoms about 0.5 mile southeast of High Rock.

An area of broken bottom also extends in a westerly direction from the southwest peninsula for about 0.8 mile,

in which a $2\frac{1}{2}$ -fathom depth was found 0.3 mile westward from the south end of the peninsula.

Along the western shore abrupt changes in depth occur within the 20-fathom curve, which approximately parallels the shore at a distance of about 0.5 mile.

From the middle section of the northwest shore an area of irregular bottom extends 0.8 mile to the 20-fathom curve, thence there is an abrupt deepening of several fathoms to seaward.

From the northernmost point, an area of broken bottom with shallow depths less than 5 fathoms extends for about 0.8 mile in a northwesterly direction. Off each of the several points along the northeast shore are small detached shoals of $1\frac{1}{2}$ to 3 fathoms. Along the eastern shore broken bottom lies within the 20-fathom curve which is 0.8 mile from the shore near the middle of this section. From the southeast peninsula of the island, a shallow area with depths less than 8 fathoms extends in a southerly direction for about 0.4 mile.

As in the case of Chaguluk Island no satisfactory anchorages are found in the vicinity of Amukta Island. During storms, the gales draw around its entire coastline to the lee side, causing violent gusts of wind successively from opposite directions along the shore. Also, no section of the coast is free of strong currents, tide rips, and seas that sweep around the island. The bottom, generally of gravel, affords only fair holding ground.

The best anchorage for southwesterly weather is in 18 to 20 fathoms, gravel bottom, about 1 mile eastward of the northernmost point of Amukta Island, off the cove in that locality. Attention is called to the detached 1- to 2-fathom shoals off the several points close to this anchorage. The strength of the current here is less than elsewhere along the northeast coast.

In southeasterly weather anchor in 18 to 20 fathoms, gravel bottom, about 0.8 mile westward of the northernmost point, or in 18 to 20 fathoms off the middle of the cove about 2 miles southwestward from the northernmost point. In coming to anchor at the latter location, a strong northeasterly current may set the vessel toward the foul areas extending from the point of the northern end of the cove, and a range on the slope of the shore ridge should be selected and held in order to avoid this.

In northwesterly weather anchor in Traders Cove, in 24 fathoms about 0.8 mile eastward from the southeastern point of the island. Care must be taken to avoid the dangerous shoals just within the 20-fathom curve.

Local magnetic disturbance.—Differences of as much as 6° from normal variation have been observed in Traders Cove.

Overnight anchorage is not recommended in the large cove on the south side of Amukta Island. Strong winds from the southeast may make up suddenly and the approach and anchorage are bordered by dangers.

A remarkable bottom configuration has been noted in the area to the eastward of High Rock. With a general depth of some 35 fathoms a mile off the south side of the island, the depth may increase rapidly to 70 fathoms

as the shore is approached. There is a considerable basin of about 50 fathoms, about 0.8 mile in length from east to west, this depth being found about 200 yards northeast from High Rock. The $3\frac{1}{2}$ -fathom shoal in this vicinity is on the southwestern rim of this basin.

As in all other parts of the Aleutian Islands, currents around Chagulak and Amukta Islands are strong and somewhat erratic in their nature. The general flood direction is to the north, and the ebb to the south. Tide rips make up swiftly and furiously at times. While the channel between the two islands is clear, tide rips give the impression of heavy seas in shoal water. On the flood, the current seems to divide on the south side of Amukta Island near the $3\frac{1}{2}$ -fathom shoal previously mentioned where the seas are very confused. The currents rejoin near the northern point of the island and the reverse action seems to take place on the ebb.

Similarly, the strongest currents along Chagulak Island are found near the southwestern point of the island, the current dividing somewhere near the center of the southern shore and rejoining on the north side of the island. The strong currents are particularly noticeable at times along the east side of this island where the general northerly trend of the current is unobstructed.

The currents very considerably in velocity, and they probably often exceed 3.5 knots.

Tide rips are conspicuous off all points, their violence being somewhat in the following order: Strongest, along the west part of Chagulak Island and in the pass between the two islands; around the southwest point of Amukta Island and near the $2\frac{1}{2}$ -fathom shoal; around the north point of Amukta Island; around the southeast point of Amukta Island, and around the southeast point of Chagulak Island.

Chart 8862.—Amukta Pass, often called the **172-degree Pass** or **Seventy-two Pass**, is a 35-mile-wide clear passage between Amukta and Seguam Islands; depths are from 55 to over 300 fathoms. Both islands may be seen across the full width of the pass in fair weather; their shores should be given a clearance of not less than 1 mile.

Seguam Island is rocky and cinder covered, has numerous lava flows, and is steep to on all sides. It has, however, several good landing places and an abundant water supply. Irregular mountain masses are on both the east and west ends of the island and a saddle is in the east central section. The formation is volcanic and the peaks are rocky, extinct craters.

The mountains on the west end are higher; **Pyre Peak**, 3,458 feet, in the west central part, is the highest on the island. The highest peak on the east end is a jagged pinnacle on a small crater within a larger crater and is 2,768 feet. The mountains on the west end of the island are more ragged. The north coast is low rock and grass bluffs. The other coasts are steep and high, with the peaks close to the coast. The two good anchorages are Finch Cove on the north, and Lava Cove on the south. Numerous pinnacles are close to shore, the most prominent are those off the northwest point, the highest 98 feet.

The precipitous eastern end of the island, except for a

small peninsula, is at the base of a volcanic mountain having a crater within a crater, 0.5 mile in diameter, at its summit. The summit has a confusing appearance; a pronounced rise along the northern rim of the main crater is 1,930 feet high and appears as a sharp peak when viewed endwise. Also a pronounced rise is along the northern rim of the inner crater which is 1,934 feet high. The southern rim of the inner crater merges with that of the main crater and is 1,820 feet high.

Relatively shoal-water areas extend off all the principal points of Seguam Island, and are usually marked by breakers in bad weather. Kelp grows profusely in most of these areas.

Currents around Seguam Island are strong and very erratic. As around Amukta and Chagulak Islands, the general flood direction is northerly, with the ebb southerly. On the flood, the current seems to divide somewhere near Turf Point, and to rejoin near Finch Point on the north. The reverse appears to take place on the ebb.

Tide rips are severe off many points; they make up suddenly and furiously, and are dangerous to small craft. Passage through the rips by small boats should not be attempted unless the operator is familiar with the danger. The worst rips are found along the western end, with lesser ones off Moundhill Point and Finch Point. These are all conspicuous and while they seem to indicate shallow water by their whiteness, they make in deep water and so are no menace to navigation for the larger ship.

Strong currents and tide rips occur around the eastern end of the island.

On the southern end of the eastern coast is **Moundhill Point**, a small, rounded peninsula which forms a very important landmark during the prevailing low visibility. The peninsula is a mound-shaped hill, 465 feet high, and has four, small, rounded protuberances at its summit. The easternmost of these is separated from the remainder of the group by an appreciable distance and by an apparent depression in the top. Rounded protuberances also characterize the slopes of the hill. The hill is separated from the mountainous mainland by a draw about 100 feet high at the neck of the peninsula. At the water's edge, the hill slopes descend to form almost vertical cliffs of rock. A fair landing is on the north side of the neck. Fair anchorage for small craft is in the cove on the south side, which is marked by three tall pinnacles near its southwestern end.

Several humps of about 3 fathoms lie in the shallow area 0.2 to 0.5 mile eastward of Moundhill Point. It is advisable to round the cape by at least 1.5 miles.

At the northern end of the east coast the land projects to seaward forming prominent **Wharf Point**, which resembles a wharf or pier from a distance. The point has a more or less flat top, 50 feet high, and the bluffs on its three sides are approximately rectangular, forming two distinctive corners at the extremity.

Finch Cove is an indentation 2 miles in extent along the northeast side of Seguam Island; its northern extremity is Finch Point. A long, rocky point formed by a spur divides the cove into two parts. At the head of

the cove, northward of the dividing point of land, is an 0.8-mile stretch of sand beach providing good landing. The approach to the middle section of this beach is apparently free of rocks and the depths decrease gradually, making this a favorable site for beaching a vessel in an extreme emergency. Several small huts are just inland from the northern part of the beach. The northern half of this part of the cove is foul with rocks of various description, among which is a 58-foot elevated, block-shaped rock. Along the shore of the cove eastward and westward of the dividing point of land are stretches of high, prominent cliffs. The western stretch is about 0.3 mile long and 300 feet high, and the eastern rounding stretch of cliff is about 0.5 mile long and 500 feet high. To the eastward of the latter is a deep valley extending inland. A cone-shaped peak, 1,447 feet high is 1.5 miles inland from the cove.

Near the center of Finch Cove, an area of extremely broken bottom with shoal depths of about 4 fathoms extends out from the dividing point for more than 0.3 mile. In the southern part of Finch Cove, along the shore eastward of the dividing point, are heavy kelp beds.

Finch Cove offers good protection in southwesterly weather. The survey ship EXPLORER remained at anchor in Finch Cove during a storm in July 1952, with southerly winds up to force 12. The ship anchorage is in 14 to 17 fathoms off the center of the northern light. Enter on course 274°, heading for the 58-foot elevated, block-shaped rock. Anchor on this bearing (a cross current may be experienced) and on cross bearing 101° to the left tangent of the dividing point of land. Tidal currents setting northwestward and southeastward have been observed. The northwestward current has a velocity of about 2 knots. The southeastward current has a velocity of about 0.5 knot. A 4-fathom spot is 0.3 mile southward from this anchorage.

Local magnetic disturbance.—Differences of as much as 1° from normal variation have been observed in Finch Cove.

Finch Point is the dividing point between the northern and northeastern sides of Seguam Island. It is formed by a broad, gently sloping ridge, the shore extremities of which break off into cliffs and ledges. Detached rocks of various descriptions lie about the point and these are particularly numerous at its northern extremity. Directly at the northern extremity, an 80-foot elevated, massive rock is a prominent landmark when viewed along the line of the northeast tangent. In this direction it appears vertical at the sides and its irregular top is roughly in the form of a gable. The outermost rock to the northward is lime-covered but it is small and only a few feet high.

At the northernmost part of Seguam Island just westward of Finch Point a large area of broken bottom extends more than 1 mile offshore. Several lumpy spots of about 5 fathoms are well offshore in this area.

The north shore of Seguam Island is irregular; the beaches are principally of lava or boulders and in general the grass-covered bluffs are directly back of the beaches. The cliffs are comparatively low. The slopes

from the cliff-tops are covered with a heavy growth of grass and rise gently toward the high interior regions. Numerous gullies break up the terrain and are approximately normal to the general trend of the coast. Several waterfalls are along this coast. **Seguam Island Light** (52°23' N., 172°26' W.), 85 feet above the water, is shown from a small white house on the point just westward of Finch Point.

A dangerous 2½-fathom pinnacle rock with surrounding depths of 23 fathoms close-to, lies about 1 mile off the northern shore of Seguam Island, about 2 miles westward of the light. The danger is not marked by kelp.

Saddleridge Point is the northwesternmost point of Seguam Island. The small rise directly inshore from the saddle, is a definite summit from all offshore directions, but not particularly prominent. A rocky islet 98 feet high, about 0.2 mile northeast from the point, and several smaller intervening rocks obscure the extremity of the point when viewed from the northeastward. A narrow cliff 231 feet high, facing seaward and topped by a small grass-covered mound, rises at the inshore end of a long, narrow, projecting ledge 1.7 miles eastward from Saddleridge Point.

A mound 80 feet high, resembling a haystack, is 3.7 miles northeastward from Saddleridge Point. The mound has the appearance of an island but is connected to the shore. A 1-mile stretch of sand and cinder beach extends to the southwestward from this vicinity, and there is a waterfall about 0.2 mile northeastward from the mound.

From the northern rock off Saddleridge Point, foul ground extends northward for 0.2 mile.

Very favorable anchorage for southerly weather may be had along the north central section of the coast of Seguam Island 1.5 to 3 miles eastward of Saddleridge Point. The ship anchorage is 0.5 to 0.6 mile offshore in 16 to 18 fathoms, sand and gravel bottom. In coming from the eastward care must be taken to avoid the 2½-fathom pinnacle 1 mile offshore; passage between the pinnacle and the shore is not recommended.

An anchorage in 20 fathoms about 0.8 mile southwestward of Saddleridge Point was used by the survey vessel. The depth decreases rather abruptly toward the shore.

Camel Islet is about 0.5 mile off the middle of the northwestern shore of Seguam Island. It is a massive rock, 53 feet high, and its top from the northward or southward resembles a camel's hump.

The northwestern coast, from Saddleridge Point to the western end of the island, a stretch of 5.5 miles, is in general a boulder beach directly in front of irregular cliffs ranging from 200 to 600 feet high. In some places the cliffs rise abruptly from the water's edge. The slopes from the tops of the cliffs to the mountainous interior are decidedly steeper than those eastward of Saddleridge Point; also, the draws and valleys are steeper and occur at less frequent intervals. About 1.2 miles northward from the westernmost point of the island, the slope is very steep and the cliffs are especially high. The waterfalls go dry in late summer. Numerous detached rocks are found off this coastal stretch.

Between the westernmost point of Seguam Island and

a high, dome-shaped, detached rock about 1 mile to the northward is a deep valley, with gentle ascending lower slopes, extending inland 1 or 2 miles.

Along the western end of Seguam Island very irregular bottom lies within the 20-fathom curve which follows the coast at a distance of about 0.5 mile. A reef is about 0.3 mile off this end, which is marked by a low rock, 4 feet high, discernible for some distance with a quiet sea. A depth of $3\frac{3}{4}$ fathoms was found 0.2 mile northwestward of the reef. Strong currents and tide rips occur in this locality.

From the western end of the island the coast trends southeastward for about 1.5 miles to **Rue Ledge**. This offshore rocky ledge, 30 feet high, is conspicuous when viewed along the southwest tangent of the island. The inshore side of the elevated part of the ledge has vertical corners; from here the top slopes to the offshore end. Halfway between this ledge and Turf Point, 2.8 miles to the eastward, is an off-lying rocky islet which is marked near its offshore end by a cylindrical pinnacle rounded at the top. A waterfall over the shore cliff is about 0.2 mile northeastward from this pinnacle.

Turf Point, the southernmost point of Seguam Island, is a comparatively low, broad, and extensive grass-covered projection terminating in a rounding bluff. The top of the point is flat and then rises gently to the steeper inland slopes, which on either side of the point terminate in hold rocky bluffs, making the point conspicuously low by contrast. A foul area fringes the rounding point. Westward of Turf Point, the south shore of Seguam Island is high and precipitous. The cliffs are close to the rocky beach and in places overhang it. The bordering mountains are high; grass extends from the cliffs to about 1,100 feet.

From Turf Point an area of broken bottom extends southward for 0.7 mile to the 20-fathom curve, thence abruptly deepening to over 40 fathoms.

On the south shore about 5 miles northeastward from Turf Point is **Lava Point**, a broad, jagged, and comparatively low point forming the terminus of an extensive lava flow. A narrow bight, but deep in extent, indents the middle of the extremity of the point. **Lava Cove**, immediately westward of Lava Point, extends for 2.5 miles to a rounded gravel point fringed with covered and detached rocks. The gravel point is formed by a short broad spur 106 feet high, projecting from a regular, grass-covered mountain slope which descends to shore cliffs on either side of the point. At the head of Lava Cove is a decided indentation in which are several streams and a 0-8-mile stretch of sand beach. An ocean swell generally makes landing difficult. The remaining shore of the cove is composed mainly of jagged projections of rock or lava cliffs of moderate elevation. Curtains of waterfall at two places about 0.2 mile inland from the eastern end of the sand beach are visible from the cove. A row of pinnacle projections marks the near-shore ridge, 335 feet high, between Lava Point and the curtains of waterfall.

From the point at the west end of Lava Cove an area

of broken bottom extends southeastward for 0.7 mile, with a depth of only $1\frac{1}{4}$ fathoms 0.4 mile off the southeastern side of the point.

On the south side of Seguam Island, Lava Cove and the next large cove to the westward offer good protection in northerly weather. The anchorage in Lava Cove is in 14 to 17 fathoms, cinder and gravel bottom, off the indentation at the head of the cove. It has little or no current. Enter on a north course heading for the eastern half of the sand beach at the head. In coming from the westward, the broad gravel point at the western end of the cove should be given a wide berth.

The southeast coast of Seguam Island from a point about 1 mile eastward of Lava Point for about 4 miles to Moundhill Point is dominated by a chain of three mountain peaks over 2,000 feet high and a very distinctive mountain 1,410 feet high, close to the shore in $172^{\circ}23'$ W. The shore slopes of these mountains generally terminate in steep, rocky cliffs, and the coast has a bold appearance. A steep bluff rising to 690 feet marks the promontory near the three high pinnacles in the southeastern part of the cove at the eastern end of this mountainous stretch. The upper reach of this bluff overlooks the draw back of Moundhill Point.

Off the middle part of this bold coastal stretch is a group of five rocky islets; the outer islet is 55 feet high near its inshore end where it drops almost vertically to form its northwestern side. The area between this group of islets and the shore is foul.

The 1,410-foot peak, close to the shore about 1.5 miles westward of the group of islets, has a steep and rugged seaward face and a definite peak. With northerly winds this mountain may be free of clouds while those in the background are covered. A small cave about 5 feet deep with an almost rectangular entrance is at the foot of this mountain near the shore. The cave is prominent when the light illuminates the surrounding yellow portion of the rocky cliff.

About 0.2 mile southwestward from the cave, a chain of rocks extends offshore for a distance of about 230 yards. The inshore rock is 110 feet high while the offshore rocks are low in comparison.

An area of broken bottom with shallow depths is within 0.3 mile of the section of the southeast shore of the island 0.6 mile to 1.4 miles from Moundhill Point.

Seguam Pass lies between Seguam and Amlia Islands. It has been regarded with suspicion, and a sailing vessel has been lost on Agligadak Reefs, on the southwest side. The pass is about 12 miles wide, and it is reported to have strong currents, rips and overfalls, but no off-shore dangers.

Vessels have reported high breaking seas in Seguam Pass. The bottom is irregular, the currents strong, and tide rips may be encountered at any place, but particularly near the shore. The flood current sets to the north-northwestward and the ebb to the south-southeastward; probable velocity exceeds 4 knots. The pass is not recommended.

Chart 9102.—Andreanof Islands extend in a 240-mile long chain from Segum Pass to Amchitka Pass.

Chart 8862.—Amlia Island, on the west side of Segum Pass, is 40 miles long and has a greatest width of about 8 miles. On the island are a few small lakes. A chain of sharp peaks extends the length of the island, but none is especially distinctive. The eastern end of the island is visible for a considerable distance and is a good landmark in fair weather; it has a straight profile at a moderate elevation and drops to the sea in a precipice. The point should be given a berth of several miles because of the rocks and reefs to the eastward and southward. The unsurveyed areas around the island should be approached with caution.

Agligadak Reefs extend about 4 miles from the eastern extremity of the island.

Agligadak, Tanadak, and Sagigik Islands are small islets off the east end of Amlia Island. Their only importance is as dangers to navigation.

Chart 9121.—**Sviechnikof Harbor** is on the south shore of Amlia Island about 15 miles from the eastern point. The entrance is about 0.2 mile wide and is difficult to make out, and should be attempted only in clear weather. **Sagigik Island**, about 9 miles eastward, and the pyramid peak to the right of the entrance, may be recognized. The harbor extends about 2 miles in a north-northwest direction and has an average width of about 0.3 mile. It can be entered without difficulty, is well sheltered, and has good holding ground. Excellent anchorage is available in the north end of the harbor in 10 fathoms, soft bottom. The west side of the entrance should be favored until past the long island and the rocks and reefs on the east side.

Chart 8862.—**Chalugas Bay**, just west of **Cape Idalug** on the north coast of Amlia Island, is a small harbor reported suitable for small boats only; however, the anchorage for small vessels in 20 to 22 feet is just off the entrance.

The bight on the east side of **Cape Idalug** offers a lee southerly weather for vessels of all sizes. The recommended anchorage for deep-draft vessels is in 9 fathoms, soft bottom, at the entrance to the inner basin.

Chart 9010.—**Amlia Pass**, a 1-mile-wide strait between Amlia Island and Atka Island, has depths of 5 to 22 fathoms through a narrow 400-yard passage restricted by a reef extending 1 mile off the Atka Island shore. The pass should be used only by small light-draft vessels at low water because of the strong and complex currents. **Red Reef**, a high part of the reef extending from Atka Island and shore, shows at all times, but is a wash in extremely heavy weather. Other small areas may occasionally appear at extreme low water.

The shores on both sides of Amlia Pass are steep, rock rising to low hills. Kelp grows along the shores. A ledge extends 100 yards outside the bluff line at Eddy Point, the westernmost point on Amlia Island. Deep

water is outside this ledge and off the shore at **Swift Point**, Amlia Island. At **Pinnacle Point**, Amlia Island, is a prominent pinnacle on the shore with an 80-foot off-lying pinnacle immediately southeastward.

A current of 10 knots has been observed in Amlia Pass; when the current is strong large tide rips usually occur. The current floods north and ebbs south. In general, tide rips exist in and outside of the north end of the pass during the flood, and in and outside of the south end during the ebb. When the current is running, small tide rips exist over the reef. During strong currents, heavy swirls exist in the pass and its approaches, the greatest intensity being near Eddy Point.

North of Eddy Point the current floods northeastward and ebbs southwestward, setting a vessel off course just north of the pass. Duration of slack is about 10 minutes; however, there is often a period of 1 to 3 hours when the current is not strong, and there are practically no tide rips.

Heavy tide rips extending several miles northeastward of Amlia Pass have been observed with a moderately heavy swell from the northeast. A pinnacle, covered 4½ fathoms, is 1.5 miles northeastward of Eddy Point, and 0.6 mile from the north shore of Amlia Island. There are probably other dangerous pinnacles in this area.

In approaching Amlia Pass from southward or northward vessels should stay in the area of charted soundings to avoid reported dangers off the islands. Courses through Amlia Pass should pass 0.5 mile off Pinnacle Point, 200 yards off Swift Point, and 400 yards off Eddy Point to avoid the reef on the west side of the pass. Extreme caution is necessary to avoid the 2½-fathom reef 500 yards westward of Swift Point.

Chart 8862.—**Atka Island**, separated from Amlia Island by Amlia Pass, is 10 by 50 miles in extent and the largest of the Andreanof group. **Korovin Volcano**, 4,852 feet high, is 3 miles inland from the northern end of the island. The formation of the island is volcanic and similar to the other islands of the Aleutian Chain. Many species of birds frequent the island, but the island and adjacent islets are reported to be overrun with rats.

Several peaks varying in elevation to 3,200 feet extend along the interior of Atka Island. These peaks are seldom visible on account of fog, mist, and low ceiling. A 1,100-foot high peak at the west end of the island is frequently clear. Because of the prevalent weather conditions, extreme caution should be exercised in approaching the land. There is considerably less fog and mist during the colder months when the higher peaks show more frequently. Currents are weak, except at the passes east and west of the island.

There are several anchorages along the south coast of Atka Island, but care should be exercised in approaching the coast because of the numerous rocks and shoals, and currents. A rock, 3.5 miles offshore and 18 miles from the west end, is covered three-fourths fathom and breaks in moderate seas. Several shoals with least depth of 10 fathoms, as much as 5 miles offshore south of Vasilief and Kobakof Bays, show current boils, slicks, and tide

rips during calm weather. Other shoals with lesser depths are farther inshore. Fairly strong east-west currents have been observed south of Sagchudak Island to south of Cape Tadluk.

There is a suitable small-craft anchorage at the eastern end of Atka Island, 3 miles west of Amli Pass in 52°06.7' N., 174°09.3' W., in 18 to 20 fathoms, sand and shell bottom, but the swinging room is limited and the water is quite deep. The off-lying islands and rocks give protection from southeasterly seas but the anchorage is open to southerly and southwesterly weather. To reach the anchorage from 52°05.0' N., 174°08.3' W., make good a course of 000° for 1.7 miles, then change course to 270° for 0.7 mile to anchorage.

Vasilief Bay, on the south side of Atka Island 10 miles west of Amli Pass, offers anchorage in 25 to 30 fathoms, fine sand with broken shell bottom, at 52°06.0' N., 174°20.0' W. The offshore islands offer some protection from southerly seas. This anchorage should be entered from the southeast, keeping 0.5 mile east of the offshore islands. There is a rock awash in 52°02.4' N., 174°21.0' W.

Kobakof Bay, 15 miles west of Amli Pass, offers excellent anchorage in all but moderate to heavy seas. Anchorage in 25 to 30 fathoms, mud and sand bottom, is available at 52°03.7' N., 174°28.6' W. The northwesterly arm of the bay offers protection from southerly seas in 20 to 30 fathoms, but is limited in swinging room. In entering the bay from a point midway between Sagchudak Island and Amtagis Island, steer a midchannel course of 347° until the point of land ahead is 0.7 mile distant, thence a course of 293° to the anchorage. Some fairly strong rotary currents may be encountered along the east side of Sagchudak Island.

The pass on the north side of Sagchudak Island is generally foul, containing kelp and shoal areas which break in a moderate swell. Only small craft having local knowledge should use this pass.

Explorer Bay, 18 miles west of Amli Pass, offers a protected anchorage in any weather in 11 to 13 fathoms, fine sand bottom. However, there is limited swinging room and the entrance is through a narrow channel between dangerous rocks and shoals. In entering from a position at 52°00.0' N., 174°30.4' W., steer a course of 000° until the north end of Sagchudak Island bears 090°, then shape course to 327°, keeping 0.3 mile off the point of land on the west side of the bay, until the southeast point of the west arm of the bay bears 210°, distant 0.5 mile, thence on course 277° for 0.4 mile to the anchorage. This course passes over or just north of an 8-fathom shoal, 0.2 mile south of a 4-fathom shoal, and 0.1 mile north of a 6-fathom shoal. The area outside the channel, on the west side of Sagchudak Island, is very broken with scattered rocks which generally are apparent to the navigator.

Beaver Bay, 23 miles west of Amli Pass, offers anchorage for small craft in the outer and western arm. Protection from all except southeasterly seas is available in 15 to 20 fathoms, fine sand with broken shell bottom. Entrance to the anchorage must be made by keeping to the southwest of the small islands in the entrance.

The small bays between Explorer Bay and Beaver Bay

offer some protection for small vessels, but the bottom is generally broken and the lee afforded from onshore winds is negligible.

Tillamook Cove, 30 miles west of Amli Pass, is of little value as an anchorage because it is open to the sea and has poor holding ground. A more comfortable anchorage is in 13 fathoms just outside the cove. A 40-foot pinnacle rock marks the seaward end of the western side. A shoal extends some distance seaward of the point of land marking the eastern side of the entrance. The western side of the cove is practically vertical to about 100 feet, then slopes steeply to over 1,000 feet. At the head of the bay is a black sand and volcanic ash beach. The eastern shore is characterized by rocky ledges; the land rises to about 300 feet from the water to a relatively level shelf before rising to the mountains farther inland. There is considerable surf with only a slight swell setting into the cove.

Sergieff Bay, 35 miles west of Amli Pass and 13 miles east of Cape Kigun, is a suitable anchorage except during strong southerly winds; holding ground is probably poor. The gently sloping beach at the head of the bay is black sand or volcanic ash. In entering the bay from a position in 51°59' N., 175°00' W., hold a course of 000° until the end of the western entrance point is abeam, then shape course to pass 300 yards off the rock awash in 52°01.6' N., and after passing this rock steer 315° for the head of the bay.

Anchorage in 20 fathoms, fine sand bottom, is near the center of the small bight 10 miles east of Cape Kigun, the western end of Atka Island. A point and off-lying reefs offer some protection from westerly seas. Vessels can also anchor in 17 to 20 fathoms, sand with broken shell bottom, 0.5 mile offshore near the center of a small bight 3 miles east of Cape Kigun.

Chart 9010.—Nazan Bay, indenting the east coast of Atka Island north of Amli Pass, provides good anchorage. The greater part of the outer harbor is partially protected, but strong winds draw through the low land between Nazan and Korovin Bays. The bay is subject to heavy swells and is at times unsafe for small boats.

Cape Kudugnak, the northern point of Nazan Bay entrance, is a 200-foot rounded, grassy knoll rising abruptly from the shore. The island behind the cape rises uniformly for 2.5 miles to a 2,887-foot mountain. **Uyak Island**, 3.5 miles west-southwestward from Cape Kudugnak, is 100 feet high, rounded with grass top and rocky bluffs.

Palisades Point, 3.5 miles westward of Cape Kudugnak, has rocky bluffs with a 322-foot plateau extending inland to the mountains. A 60-foot-high rock is close to shore just west of the southern end of the point. A T-head pier in poor condition is 0.8 mile northwestward of the point. The 400-foot face has depths of about 22 feet alongside.

Cone Islands, near the western part of Nazan Bay, are 43 to 83 feet high; the northernmost of the three islands has three remarkable pinnacles on it.

Bolshoi Islands are a group of grass-covered islands along the south shore of Nazan Bay. The westernmost

and largest forms the eastern side of the inner harbor at Atka. A waterfall on the south shore of the bay, 1.7 miles southeastward of Atka, is prominent.

Anchorage for large vessels is available in the outer harbor westward of Pallasdes Point in 35 to 17 fathoms; vessels can also anchor close to the northern shore of the bay eastward of the point. Anchorage west of Bolshoi Islands in the inner harbor in 6 to 12 fathoms is sheltered, but is limited in area to only small vessels.

The tide in Nazan Bay is chiefly diurnal, the range being 3.3 feet. The harbor in the western part of the bay will often be clear when there is fog in the entrance.

Local magnetic disturbance.—Differences of as much as 5° from normal variation have been observed in Nazan Bay.

Vessels proceeding to anchorage in the western part of Nazan Bay should pass northward of Uyak Island taking care to avoid the 5-fathom rock 0.7 mile eastward of the island. Small vessels continuing to the inner anchorage should pass midway between the highest part of the southern Cone islet and the high-water rocks at the northwestern point of the largest Bolshoi Island.

Trading vessels bound through Amliia Pass use a channel southward of the Bolshoi Islands, but this route is not recommended without local knowledge because it is near many covered and uncovered rocks, and passes through an unsurveyed area.

Atka (1960 population 119), at the west end of Nazan Bay behind Bolshoi Islands, is not visible until after the largest island is passed. Most of the village population is employed in fishing and sealing at Pribilof Islands. Mail is delivered by air from Anchorage. Fresh water is available from a stream near the village. Small boats can be beached on a well-sheltered tide flat behind Bolshoi Islands, 0.4 mile southeast of the village.

Chart 8862.—The north coast of Atka Island is indented by numerous small bays. Most of the points are bold headlands rising to sheer 300- to 800-foot knobs or heads, and then rising more gradually to the peaks farther inland. The land area is treeless and is covered with tundra to about 1,000 feet, above which there is little vegetation. Bluffs generally extend into the bays and points, but as a rule the heads of the bays are low, with sand, gravel, or small boulder benches, back of which gulches carry into the interior. A low pass crosses the land between Nazan Bay and Korovin Bay. Southwestward of the pass the island is lower and runs off to the narrow western end.

A high conical peak is near Cape Shaw, the eastern extremity of Atka Island. North Cape Light (52°26' N., 158°11' W.), 115 feet above the water, is shown from a small white house at the end of North Cape, the northern point of the island. The slopes of the Korovin Volcano mountain break off in a rocky escarpment at the cape.

Chart 9136.—Korovin Bay, on the north side of Atka Island and across a low pass from Nazan Bay, is a good anchorage except in heavy westerly weather. The shores are bold, sheer cliffs bordered by numerous pinnacles, except for the low gravel beach at the head and low land near a lagoon on the north shore. The entrance points, Cape Korovin on the north and Egg Point on the south, are bold headlands rising abruptly to mountain ranges. Egg Point terminates in a prominent 135-foot-high pinnacle rock at the shore.

Korovin Bay has depths of 80 to 10 fathoms to within 0.6 mile of the shore, except for rocks about 2 miles from the east end. The higher of these two rocks bares 4 feet and can be used as a navigational aid. A prominent 100-foot-high pyramidal-shaped pinnacle rock is near the head of the bay about 0.2 mile off the south shore.

Anchorage is available in the northeastern part of Korovin Bay in 40 to 10 fathoms with gray sand bottom, fair holding ground. The small coves on the south shore provide shelter for very small vessels, but the swinging room is limited. The bay is not sheltered from the southeast or southwest because strong winds howl through the draws and ravines which cut the hogback on Atka Island; caution is necessary to avoid being forced onto the north shore. Oftentimes, when it seems as though the winds coming out of the draws in a southeast direction are the prevailing winds, it will be found that outside the bay the general winds are southwest.

Sarana Cove, indenting the south shore of Korovin Bay 4 miles east of Egg Point, is foul and should not be attempted by any craft without local knowledge. Martin Harbor, 6 miles east of Egg Point, is small but offers good protection for small craft in all weather at the head in 11 fathoms with mud and sand bottom.

Egg Bay is separated from Korovin Bay by the rugged cape which terminates in Egg Point. The shores of Egg Bay are mountainous, with humpy, grass-covered slopes. At the head of the bay is Egg Island, steep sided, round topped, and grass covered.

Starichkof Reef lies 1.5 miles westward of Egg Point. The easternmost and largest islet is a vertical-sided block of rock 61 feet high. The second most conspicuous rock is a spurlike pinnacle about 0.5 mile northwest of the block-like rock. There are several other rocky islets, as well as a number of reefs or shoals in this area.

A dangerous 2-fathom shoal lies 0.3 mile north of the islets and 1.6 miles west of Egg Point.

Two shoals southwest of Starichkof Reef make it inadvisable to enter Egg Bay from the west side of the reef. One shoal, having a least depth of 2 fathoms, is 0.5 mile southwest from the westerly group of islets. The other shoal, having a least depth of 3 fathoms, is located 0.8 mile southwest from the same islets.

A 4½-fathom shoal is 0.3 mile offshore on the east side of the bay, 0.8 mile south of the entrance at Egg Point.

Several other shoals having least depths of 8 to 12 fathoms lie near or in the bay. They should be avoided.

Numerous rocks and reefs border the shores of Egg Bay. The east shore for the first 2 miles south of Egg Point is especially dangerous and should not be approached closer than 0.3 mile.

A pinnacle rock with a least depth of 2 feet is 250 yards off the northeast shore of Egg Island.

Approach Egg Bay on a course of 180° to pass 0.5 mile

east of the easternmost islet in Starichkof Reef. When this islet is slightly abaft the beam, change course to 134°, heading for the left tangent of Egg Island. When 0.5 mile from Egg Island, haul to the left and round the island, keeping approximately in midchannel.

Anchorage for medium-draft vessels is found northeast of Egg Island in 20 to 25 fathoms. The bottom is soft, fine, green sand, with rather poor holding ground. The lower end of Egg Bay offers fair protection in both northerly and southerly weather. The least swell is found south of Egg Island.

From Egg Bay to Banner Bay the shoreline is irregular and has several small bights. The bights, as well as the approaches to them, are foul. This area should be avoided.

Banner Point, on the northeast side of the entrance to Banner Bay, is lined by bluffs. Above the bluffs the land slopes upward to a 1,590-foot peak about 1 mile from the outer end of the point. A grass-covered islet, 105 feet high, is 0.3 mile northeast of Banner Point.

A rock that uncovers is 0.5 mile north of Banner Point; 0.1 mile north of the rock is a 2-fathom shoal; 0.2 mile northwest of the rock is a 5-fathom shoal. Kelp grows on both shoals.

Banner Bay is about 3 miles long and 0.8 mile wide. The trend of the bay is east and west. The shores are bold but free of dangers except for two groups of rocks, 2 and 25 feet high, in the northeast half of the entrance, and for an 8-fathom spot 0.3 mile off the south shore, 1 mile inside the entrance. Anchorage is available 0.6 mile from the head of the bay in 33 fathoms, which is the general depth in this part of the bay. Strong winds pull through this bay and as a rule, are diverted to blow in or out of the bay.

Approaching Banner Bay, a large group of rocks, from which a foul area extends 0.8 mile southward, lies about 1 mile north of the entrance and 0.6 mile off the shore of Atka Island. The highest of these rocks, 57 feet and grayish in color, serves as an aid in reaching the bay.

To enter, from a position with the northeast point of Salt Island bearing 290°, distant 0.5 mile, steer 156°, heading for the highest bluff (also the highest nob on a ridge of low hills) at the south point of the entrance to Banner Bay. Hold this course until the group of rocks in the entrance to the bay bears 090°, then haul to the port into the bay on midchannel courses.

Salt Island, about 2.5 miles west of Banner Point, is a valuable aid to the navigator in approaching Atka Island. This island is 1.3 miles long in a northeast and southwest direction and about 0.5 mile wide. The highest point of the island, 546 feet, is in the northeast half. All shores are rocky and bold, the northwest shore and northeast and southwest points being particularly so, with sheer cliffs over most of the shoreline, which is fringed by high pinnacle rocks. These pinnacles are particularly evident when the island is viewed from the southwest or northeast. The island is covered with grass and tundra. A small cabin is near the east end of the south shore.

A group of bare rocks lies 0.5 to 1 mile southeast of

Salt Island. The highest of these is a light-colored, gray pinnacle of 88 feet. A reef covered with heavy kelp obstructs the passage between Salt Island and these rocks and then continues southeastward. A small-boat passage is about 0.3 mile off the shore of Atka Island. It has a least depth of 6 fathoms, and scattered kelp over most of the passage. Foul ground extends 300 yards offshore, and heavy kelp may be encountered 0.5 mile off the Atka shore.

A 2-fathom shoal is 1.3 miles south of Salt Island and 1.4 miles west by north from the nearby prominent point of Atka Island.

Several reefs extend offshore from the north side of Salt Island, up to a distance of 0.3 mile.

Anchorage in 22 to 24 fathoms, sand bottom, is available south of Salt Island, affording protection from northerly and easterly weather. Anchor with the trend of the east shore of Salt Island in range and bearing 020°, and the 38-foot pinnacle in the group of rocks off Salt Island bearing 090°. Small vessels may anchor close inshore. Considerable shelter is afforded by the reef and kelp patch extending out from Salt Island.

In westerly weather suitable anchorage is available in 20 fathoms, sand bottom, about 0.5 mile off the east shore of Salt Island, with the 38-foot pinnacle bearing 200°.

Anchorage for large vessels is available in the bight of Atka Island to the south and southwest of Salt Island, in 20 to 25 fathoms, hard bottom, with protection from easterly to southwesterly weather. The approaches to the shores and anchorage are free of dangers, except for scattered off-lying rocks which are well within the 20-fathom curve.

Deep Bay, about 3 miles southward of Salt Island, is about 2 miles long and averages 0.3 mile wide, making into the Atka Island shore in a southeasterly direction. General depths range from 20 to 28 fathoms. From the northwest a long flat ridge can be seen at the south side of the entrance to the bay. The shores are bold but clear of dangers, except for several rocks at the middle of the entrance, and adjacent foul ground and rocks 100 to 200 yards off the entrance points. The most prominent rock in the middle of the entrance is 6 feet high. Anchorage in this bay is not suitable for large craft because of insufficient swinging room. Medium-sized craft may anchor in 20 fathoms about 0.5 mile inside the entrance, or in suitable depths at the head of the bay. Bottom in the bay is hard. About 0.5 mile inside the entrance to the bay, a small inner bay makes into the south shore. This small bay is about 0.3 mile long, and depths range from 2 to 5 fathoms. It is suitable for small craft. To enter Deep Bay, pass 200 to 300 yards west to southwest of the 6-foot rock in the middle of the entrance.

Island Point, 4 miles southwest of Salt Island, is an irregular-topped, grassy headland 502 feet high. Because of the low valley between the headland and the main shore, this point may appear as an island to ships approaching from the west. Rocks and reefs fringe Island Point from 200 to 500 yards offshore. A conspicuous rock 22 feet high lies 0.2 mile northeast of the point.

The bight in the shoreline between Island Point and Kovurof Point is about 1.5 miles in depth. Three inner bays open into this bight.

Bluefox Bay is the open bight extending for several miles west of Island Point. Two arms extend to the east and the south. A conspicuous, rugged hill 1,485 feet high is west of these arms. The shoreline of Bluefox Bay, especially in the arms, is irregular and broken, with many inshore reefs and pinnacles.

The eastern arm is open and easy to approach. It offers some protection from easterly weather. Anchorage is in 16 to 20 fathoms, the bottom irregular and rocky, and offering poor holding ground.

A rock awash is located at the entrance to the southern arm, 0.2 mile west of the east shore. This southern arm has a hard bottom and is an indifferent anchorage for shallow-draft craft. A 4-fathom shoal lies in the middle of the entrance to the bay, south of the rock awash. The west shore should be favored in entering the arm.

A small unnamed bay about 2.5 miles west of Bluefox Bay is behind a chain of rocky islets making out from the shore in a northeast direction. The larger and closer inshore islets are flat topped and grass covered; the outer islets are bare, black rock and of lesser height, the outermost being 20 feet high. A number of kelp patches on 3- to 5-fathom shoals are from 0.1 to 0.5 mile offshore northwest of these rocks. The offshore point of these rocks should be given a berth of at least 0.8 mile.

The shoreline between the chain of rock islets and Wall Bay has two indentations or inlets. At the head of these, as well as at the heads of the two first-mentioned arms, are small beaches where pulling boats can land.

The bottom in the area between Bluefox Bay and Wall Bay is irregular and spotted with rocky patches.

Wall Bay is on the east side of Kovurof Point. It is a small bay which may be used as an anchorage by medium-draft vessels. This bay is about 1.5 miles long in the north and south direction and about 0.8 mile wide. High hills and bluffs border the west side of the bay, and moderate hills lie on the east side. A valley leads off to the south from the head of the bay. In southerly weather strong winds sweep out from this valley into the bay, making the bay an indifferent anchorage. The point on the east side of the bay appears as a long, broken, sloping reef terminating in detached rock reefs at the waterline. A 9-fathom shoal is on the east side of the entrance to the bay, about 0.6 mile east of the Kovurof Point shoreline and about 0.8 mile north of the rocks on the east side of the bay entrance.

A small dome-shaped, rocky islet 14 feet high is 0.1 mile west of the west shore of the bay about 1 mile south of Kovurof Point. A 3-fathom shoal is 270 yards 115° from the rocky islet; a 2½-fathom shoal is 550 yards 175° from the islet.

A reef that uncovers 1 foot is in the lower part of the bay, 0.1 mile off the east shoreline and 0.5 mile southeast of the islet. A covered reef, marked by kelp, extends northward northwest from the 1-foot reef. Because of the various shoals it is not advisable for vessels to approach south of the islet.

Approach Wall Bay on a heading of 180°, passing the Kovurof Point shoreline at a distance of 0.3 mile. When the rocks on the east side of the entrance are 1 point forward of the port beam, anchor in 17 fathoms, gray sand bottom.

Small boats can land on the sand beaches at the head of the bay.

Chart 9137.—Kovurof Point is the most prominent point westward of Salt Island along the north shore of Atka Island. It is a double point, both parts of which slope gradually up to a common peak 1,320 feet high. This peak is quite prominent on the few days out of the summer when it can be seen. The east point is the more prominent of the two and makes out farther to the northward. It is distinguished by four flat-topped pinnacles directly off the point. Two of these pinnacles blend in together from certain directions and only three can be seen. The pinnacles identify this point.

Between Kovurof and Bechevin Points is a bight 1 mile in depth. Two small inner bays open into this bight, Kovurof Bay and Podsopochni Bay. They are separated by a peak 1,140 feet high, which stands alone. The summit is a sloping ridge as seen from offshore; a sharp peak as seen from the east and west.

Kovurof Bay is suitable as a small-boat refuge. There are numerous islands and rocky islets at its entrance. The passage west of these islands into the head of the bay is free of all dangers, except close alongshore. Anchorage for small craft is available in 4 to 10 fathoms, sand bottom.

Podsopochni Bay, between Bechevin Point and Podsopochni Point, has a general depth greater than 10 fathoms and may be used as an emergency anchorage for small- and medium-sized craft in any but northerly weather. The bay is free of dangers to within 0.3 mile of the shore. Enter the bay midway between the small, grass-covered island, 40 feet high, off Podsopochni Point, and the kelp-marked 1½-fathom shoal 0.7 mile northeast of Bechevin Point.

Bechevin Point, 5 miles southwest of Kovurof Point, is also a double point, with a small bight in the shoreline between. The bluffs at the ends of these points rise to about 250 feet and are brown in color, streaked with gulleys and studded with pinnacles. The eastern part of the point rises abruptly to a sharp peak of 710 feet; the western part rises to a head of 615 feet, and then drops to a saddle before rising to the 1,000-foot ridge behind.

North of the western part of Bechevin Point at a distance of 0.7 mile is a rocky 14-foot islet which is the most conspicuous and dangerous menace to navigation in this locality. Matted kelp and submerged reefs make out from the point and surround this rocky islet for some distance. Passage between the islet and the point should not be attempted, except by small craft; a low, flat reef which uncovers 2 feet is 400 yards off the point.

The deep bight between Bechevin Point and White Point contains two small inside bays. The bay to the eastward, Portage Lagoon, is marked by numerous bare, black, rocky islets at its entrance, and by a high, steep-sloped

peak directly west of the entrance. This lagoon which extends from Bechevin Bay across Atka Island almost to the Pacific side of the island, when seen from the northwest, appears as a low pass through Atka Island. Small boats can enter Portage Lagoon as heavy seas do not enter this lagoon because of the string of reefs and islets across the entrance which act as a breakwater. Passages between these reefs are narrow and dangerous, especially in heavy weather, and should not be attempted by strangers. One passage lies between the southwesternmost reef and the west shoreline. Several kelp-covered reefs are in this passage. A second passage lies east of the grass-topped islets and about midway in the line of reefs. This passage is about 50 yards wide and has covered rocks on both sides.

Bechevin Bay, when approached from the north, is identified by the aforementioned low pass or valley cutting through the mountainous coast of Atka Island to the Pacific. The rocky islet 0.7 mile off Bechevin Point helps to identify the bay. The southwest side of the entrance to the bay is marked by a rugged hill with deeply eroded scars and slides. The base of the hill is fringed with whitish-gray rock along the shore. Farther in, a low, grassy headland is rounded when entering the inner part of the bay.

Bechevin Bay is about 4 miles long and 1 mile wide. It is fairly open and exposed. Strong, gusty winds drawing through the mountain passes are common. Large ships anchoring in the outer bay will find less wind in the lee of the prominent 1,460-foot hill just southwest of Portage Lagoon. The survey ship frequently anchored 0.5 mile off the shore under this hill in 20 fathoms, with the north tangent of the hill bearing 090° and the low, grassy headland on the north side of the entrance to the inner bay bearing 250°. The bottom is even and consists of coarse, dark sand with broken shell.

The inner bay offers good anchorage to shallow-draft craft. The north side is shoal and has a boulder bottom; it should be avoided. A broad, sandy beach stretches across the head of this bay. Anchorage in 3 to 5 fathoms with sandy bottom is found off this beach, which is a good landing place for small boats.

Medium-draft vessels will find anchorage in 11 fathoms at the entrance to the inner bay midway between the south shore and the low, grassy headland on the north side. This grassy headland and the whitish, gray cape beyond should be on range. The bottom is sand and is fair holding ground.

The peninsula to the north and west of Bechevin Bay consists of two rounding points, White Point and Stripe Point. Between the east and west points is a low valley in which is a lake, the overflow of which empties into the Bering Sea at a waterfall. This waterfall can be distinguished well offshore. To the east, **White Point**, which is the west shore in approaching Bechevin Bay, is identified by light-colored gray bluffs. **Stripe Point** consists of two ridges which rise gradually to a common peak. Conspicuous gray-colored rock slides mark this point with a striped effect which identifies it. Between the two heads at Stripe Point, is a light-colored boulder beach.

Crescent Bay, southwest from Stripe Point, is a bight in the shoreline of 1 mile depth. The head of this bight shows a low pass across the island. The shores are rocky except at the western end of the head of the bight which is sand and gravel. Two inner bays are suitable for small craft. One, at the east end of the head of the bay, is 0.5 mile long and 0.2 mile wide with anchorage in 3 fathoms and is open to the west. The other is a small lagoon, at the middle of the head of the bay, suitable only for the smallest launches.

Slope Point, the west side of Crescent Bay, is a grassy, sloping ridge, rising gradually to a hill 880 feet high. Several rocky islets 1 to 5 feet high extend from the end of this point.

Kigun Bay, the bight between Slope Point and Cape Kigun, is backed by low hills appearing as a low pass through the island. Depths of 10 to 15 fathoms are in the outer part of the bay, decreasing to about 3 fathoms within 0.2 mile of the shore. The head of the bay is light-colored sand which is evident from seaward. In the eastern half of the bight, a low point of scattered, rocky islets makes out from the shore; the point is surrounded by kelp. Foul ground is near the shore around most of the bay.

Cape Kigun, the western extremity of Atka Island, is a bold point of brownish cliff with close, alongshore reefs. The ridges making up from the several small points converge on a round-topped peak, about 1,100 feet high, which is prominent in clear weather. It is a single peak 0.6 mile east from the extreme west end of the island.

Koniuji Island, 14 miles northeastward from Cape Kigun, is volcanic, and all sides, except the south and southeast, are sheer and precipitous, rising to two sharp summits of 880 feet and 760 feet. The south side of the island, above lower bluffs at the shore, slopes gradually to a ridge about 0.2 mile north and drops off again into a ravine which passes through the island at some elevation. The slope up from the south side is grass covered. The northwest end of the island is a low, flat, rocky point about 200 yards long. About 75 yards off the north shore is a detached rock, 8 feet high, which is distinguishable from certain directions. An extensive kelp patch makes out to the south of the island. Also, in the summer, heavy kelp is found along and well off the west shore. The island is clear of dangers at a distance of 0.5 mile from the shoreline.

This island is the nesting place of thousands of sea fowl, which make their nests among the grass-covered, volcanic boulders that cover many parts of the island.

Local magnetic disturbance.—Differences of as much as 3° from normal variation have been observed on Koniuji Island.

Kasatochi Island, 10 miles northwestward from Cape Kigun, is an extinct volcanic crater rising to 1,038 feet. The south and southeast sides are grassy slopes; the west and southwest sides are high, rocky bluffs. There is a small islet adjacent to the southwest side. As seen from the south and southwest, the sides are gradual slopes, and the summit (rim of the crater) shows as a ridge with

several nobs of varying heights. The north side, as seen from the east and west, appears abrupt and sheer, with the north part of the crater rim showing as a sharp nob. As one proceeds to the north or south of the island, these nobs, being parts of the crater rim, change to ridges.

The island can be approached by deep-draft vessels to within 1 mile. An exposed anchorage is available in an emergency on the south side in 15 to 20 fathoms, hard bottom. A trapper's cabin is on the slope on this side.

Chart 9138.—Oglodak Island is about 4.5 miles southwest of Cape Kigun, the western extremity of Atka Island. It is about 1.3 miles long and 0.7 mile wide and is steep and mountainous. The shores are precipitous and rocky, and fringed with off-lying islets and rocks.

Atka Pass, 4 miles wide between Atka Island and Oglodak Island, has depths of 10 fathoms or more to within 0.5 mile of each shore. A shoal with a least depth of 2 fathoms is 0.5 mile north of Oglodak Island; broken ground with depths of 7 to 9 fathoms extends 0.8 mile southeastward of the island. There are heavy tide rips and strong currents in the pass. Atka Pass is one of the best passages in the Andreanof Islands between the Bering Sea and the Pacific.

Ikiginak Island, 1 mile west of Oglodak Island, consists of an almost cone shaped mountain, 831 feet high. The island is 700 yards in diameter with detached islets at the eastern and western ends. The shores are steep, rocky, and fringed in places by off-lying rocks.

The pass between Oglodak Island and Ikiginak Island has rocks extending from both shores; it is not recommended without local knowledge.

Fenimore Rock is 1.7 miles west of Ikiginak Island and 1.6 miles northeast of the easternmost of the rocky islets extending east of Tagalak Island. The rock is about 300 yards long and 214 feet high. There are several off-lying rocks covered 2 to 4 fathoms.

Fenimore Pass, westward of Fenimore Rock, has depths of 17 to 25 fathoms. Tide rips are found in several parts of the pass, and currents in excess of 4 knots have been observed.

Tagalak Island, about 6 miles west of Ikiginak Island, is mountainous, roughly triangular in shape, and about 3 miles long and 2.5 miles wide. From the eastern point of Tagalak Island, a chain of small rocky islets, fringed by foul ground, extends to the eastward about 2.7 miles. The highest peak on Tagalak Island is 1,783 feet. The shores in general are steep and rocky with a few small beaches. The shoreline in most places is fringed by detached rocks.

On the north side of the island chain is a bight which affords temporary anchorage in good weather with fair protection from the south and west in 10 to 15 fathoms, and bottom; holding ground is fair. Currents are quite strong.

Tagalak Pass, 1 mile wide in its narrowest part between Tagalak Island and Chugul Island, has depths of 5 fathoms or more to within 0.3 mile of the shores. The pass has the strongest tide rips and overfalls encountered

in the Andreanof area. The pass is not highly recommended, but if used, midpass courses should be followed.

Chart 9139.—Chugul Island is 4.5 miles long from northwest to southeast and 2.5 miles wide from north to south. The highest summit reaches 1,700 feet. There are several small lakes and streams on the island. The coast is generally steep and rocky, but there are indentations with sandy beaches at the heads. **Cape Kagalus** marks the southeastern extremity of the island.

Igitkin Island, about 1 mile northwest of Chugul Island, is 5.5 miles long and quite narrow. It is divided into two parts, connected by a low isthmus about 0.3 mile wide. Aside from this isthmus, the island is mountainous and rocky. North of this isthmus is a small cove, **Igitkin Bight**, and to the south is a somewhat larger indentation, **Shelter Cove**. The coast of Igitkin Island is in general steep and rocky and fringed with islets and detached rocks.

Igitkin Bank, with depths of 1 to 10 fathoms, extends 2 miles westward of **Igitkin Point**, the western extremity of the island.

Shelter Cove is a small cove opening on Igitkin Pass. It is not recommended as an anchorage due to its size, rock bottom, and its exposure to draw winds from north and south.

Igitkin Bight probably affords partly sheltered anchorage for small vessels; it is presumably subject to the same draw winds that prevail at Shelter Cove. It is about 0.8 mile long and has an entrance about 0.3 mile wide with black sand bottom. Depths inside range from 6 to 2 fathoms, but there are rocks and foul ground varying distances offshore. The bight is open to the north.

Igitkin Pass, separating Chugul and Igitkin Islands, is clear and deep and perhaps the best pass from the north and east to Kuluk Bay. It is 3.5 miles long and the navigable channel is about 0.5 mile wide at the narrowest point at the western end. A midchannel course of 248° leads directly into the pass north of Umak Island through which entrance into Kuluk Bay can easily be made. Tide rips have been reported between **Kingfisher Point**, on Igitkin Island, and the northwest point of Tagalak Island, between **Kingfisher Point** and the east end of Chugul Island, and at the west end of Igitkin Pass. When the current is setting west through Igitkin Pass there is a strong southerly set near the western end of the pass.

Chugul Pass, between Chugul Island on the east and Anagaksik and Umak Islands on the west, is about 4 miles wide, and is deep and clear.

Next to Atka Pass, Chugul Pass, in combination with Asuksak Pass, is considered the best passage from the Bering Sea to the Pacific between Seguam Pass and Adak Strait. It is the best passage to Kuluk Bay from the southeast. Prominent landmarks that can be used during the approach from south and east are the island of Anagaksik; Cape Azamis, the southeast tip of Little Tanaga; the prominent, two-fingered pinnacle near the southeast end of Chugul; and the conical-shaped island of Ikiginak. From a position 3 miles east of Anagaksik, a course made

good of 303° will pass **Cape Ruin**, the northeast tip of **Umak**, at a distance of 1 mile. From this point, making good a course of 263° will lead down the middle of **Asuksak Pass**, passing 1.5 miles off **Cape Chalik**, the western tip of **Umak**. Throughout **Chugul Pass** are strong tidal currents. In thick weather, dead reckoning is difficult because of these currents. Daily current predictions are contained in the **Tidal Current Tables**.

Chart 9193.—**Great Sitkin Island**, about 24 miles westward of **Atka Island**, is about 10 miles long and 8 miles wide. It is volcanic and extremely mountainous, the highest summit, an active volcano, is 5,740 feet. Much of the shore is steep and rocky, but with considerable stretches of sandy beach. It has some off-lying rocks both exposed and covered. Two large indentations are **Sand Bay**, on the southwestern side, and **Yoke Bay**, on the southeastern side.

Teapot Rock is a large teapot-shaped rock lying about 150 yards off the northeastern extremity of **Great Sitkin Island**.

Swallow Head Light (57°07' N., 176°09' W.), 80 feet above the water, is shown from a white skeleton tower on the northwestern end of the island.

Chart 9139.—**Ulak Island** lies about 2.3 miles east of **Bugle Point**, the eastern extremity of **Great Sitkin Island**, and about 2.5 miles north of **Igitkin Island**. It is a barren rock, about 0.9 mile long, 0.2 mile wide, and 688 feet high. Deep water is close to the island on all sides, except the southwest point where rocks extend out 300 yards.

Yoke Bay, on the southeast coast of **Great Sitkin Island**, has three arms. The best anchorage of the three is the middle or **West Arm**; it is about 1,500 yards in extent and affords anchorage in about 20 fathoms. The bottom is sticky hard mud, affording good holding ground. Limited anchorage space is available in both **North Arm** and **South Arm**. The bay is subject to williwaws, but their effect is not serious on ships equipped with good ground tackle. **Yoke Bay** is open to swells from the Pacific Ocean from the southwest, although they are somewhat broken in their approach by nearby islands; it is entirely open in a northeasterly direction to the **Bering Sea**.

Great Sitkin Pass lies between the southern peninsula of **Great Sitkin Island** and the islands of **Igitkin**, **Tagadak**, **Kanu**, and **Tanaklak**. The pass has depths of 7 fathoms or more. Between **Zaliva Point** and **Passage Point** currents of 2.5 knots have been observed and greater velocities are to be expected. **Yoke Pass** is at the northern entrance to **Great Sitkin Pass**, between **Igitkin Bank** and **Rip Point**. Due to tide rips, currents, and the frequent changes of course required, **Great Sitkin Pass** is not recommended, but if used, clear **Rip Point** by 0.6 mile and **Igitkin Point** by 1.2 miles to avoid the covered rocks extending from the points; thence change course to pass 0.2 mile north of **Box Island**, thence a midchannel course between **Tanaklak Island** and **Great Sitkin Island**.

Tagadak Island, about 2 miles southwest of **Igitkin Island**, is small and roughly triangular in shape. The

island is very rugged; the shores are steep and rocky except part of the western side which has a sandy beach. The coast in most places is fringed with reefs or shoals. It has been reported that **Tagadak Island** is used as a breeding ground by geese and ducks.

Kanu Island, 905 feet high, lies about 0.5 mile southwest of **Tagadak Island**. The island is rocky and mountainous and about 1.5 miles long and 1 mile wide. The shores in general are steep and rocky, except on the west side where there is a sand or gravel landing beach about 0.5 mile long protected by other islands from all except southwest winds. The coasts are mostly fringed with reefs and exposed and covered rocks. A relatively shoal area extends to the northward for nearly 0.7 mile. Near the northern end of this area lies **Box Island**, a small rocky islet about 20 feet high. A small cove on the east side of **Kanu Island** might afford some shelter for small craft.

Tanaklak Island, about 1.5 miles west of **Kanu Island**, is about 1.8 miles long and 0.5 mile wide and is rocky and rugged. The island is one of low relief and rolling hills.

The channels between **Tanaklak Island** and **Kanu Island** and between **Tanaklak Island** and **Asuksak Island** are deep and clear.

Asuksak Island, 0.5 mile south of **Tanaklak Island**, is steep and rocky and consists mainly of one mountain 945 feet high. The island is about 0.7 mile long and about 0.5 mile wide. On the northeast end of the island is a low point with a gravel beach on each side.

Aziak Island, 706 feet high, 0.5 mile west of **Tanaklak Island**, is about 1 mile long and 0.6 mile wide and is rocky and hilly.

Sand Bay, on the southwest coast of **Great Sitkin Island**, provides suitable anchorage in 12 to 15 fathoms about 1,000 yards offshore. The bay is protected on the north and east but is subject to heavy seas during a westerly gale. Strong tidal currents run in the bay.

In 1964 the outer section of the long pier in **Northeast Cove**, **Sand Bay**, was reported uprooted and washed ashore; the inshore section was in poor condition. A current of 2 or 3 knots sets southeastward along the pier during the ebb, making it almost impossible for large vessels to make a landing on the south side of the pier. No vessels are allowed on the north side of the pier.

Chart 9140.—**Anagakeik Island** is about 2 miles east of the eastern end of **Umak Island** and on the southern side of the entrance to **Chugul Pass**. The islet is a precipitous rock about 1 mile long, 0.5 mile wide, and 842 feet high. It has a few off-lying rocks, but in most places deep water extends close to the shore.

Umak Island, about 5 miles southwest of **Chugul Island**, is a mountainous, irregularly shaped island about 6 miles long and 3 miles wide with a deep bight indenting the northeast coast. From this bight a low pass extends to the opposite side of the island. The shores are in general steep and rocky with occasional stretches of sandy beach. The north coast is foul, with many detached rocks, exposed and submerged. A number of islets lie off the east

coast. The south coast is in general clear, with few off-lying rocks, except toward Cape Chakik, the western extremity, where there are stretches of fringing reefs. Birds of many species frequent the island; there are also seals on the island.

Umak Bight is about 2 miles in extent and its principal arm is about 0.6 mile wide at its entrance. The bight is open on the east to Chugul Pass, and considerable swell from the ocean may be expected in heavy easterly weather. In all other weather the bight is one of the better anchorages in this area, with depths of 26 fathoms and excellent holding ground of green mud near the head of the bight. Stray winds sweep over the bight from the low pass to the west of Umak Bight. A sand beach is at the head of the bight.

Asuksak Pass, separating Umak Island from Kanu and Asuksak Islands, is 1.3 miles wide at its narrowest point and is deep and clear, but the currents are strong between Kanu and Umak Islands. It is inadvisable to attempt the pass in thick weather.

Umak Pass, between Umak Island and Little Tanaga is 0.6 mile wide at its narrowest point and 7 miles long with depths of 8 to over 50 fathoms. Currents of 3 knots have been observed in the pass and greater velocities probably occur. The changes of current are accompanied by erratic movements and tide rips. Daily predictions for Umak Pass may be obtained from the Tidal Current Tables. A rock awash is 0.5 mile southeastward of Cape Chakik and 500 yards offshore. In clear weather a mid-day course can be taken through the pass. In thick weather the northern side should be favored, entering the pass from eastward, until westward of the narrows, when it is best to favor the southern side.

Little Tanaga Island is about 8 miles long and has a greatest width of about 7 miles. The island is extremely regular in form. Two long bays, separated by a narrow isthmus, nearly cut it into two parts. The island is very rocky and mountainous; the highest peak is 1,747 feet. The shores in general are steep and rocky, and the coast generally is fringed with reefs, islets, and detached rocks. Several streams and small lakes are on the island.

Scripps Bay, on the north coast of Little Tanaga Island, is a well-protected anchorage though subject to williwaws. The bottom is coarse sand with pebbles, but appears to be fairly well. A sandy beach, intersected by a stream of fresh water, lies at the head of the bay. Scripps Bay is subject to fog and reduced visibility; it is frequently here when the western and northern sections of the Alaska Bay (Adak Island) are clear. In entering the pass 400 yards off the rocky islet 0.3 mile inside the shore to avoid the 2¼-fathom spot off the west point of the entrance. Anchor in 18 fathoms 750 yards southward of the islet. Small vessels can anchor in shallow water near the shore.

Umak Bay, on the south coast of Little Tanaga Island, is about 2.5 miles long and 0.8 mile wide. Depths are suitable for anchorage, but only small vessels may find room which is reduced by numerous small islets. A 8-fathom depth is 0.4 mile southeastward and a 10-fathom shoal is 0.2 mile eastward of Chisak Island

The upper end of the bay is clear, but the channel, close westward of Chisak Island, leading to it is very narrow. The bay is almost landlocked, but is reported to be exposed to swells and seas from the Pacific Ocean. A stream of fresh water enters at the head of the cove. The shores of Chisak Bay consist of narrow rocky beaches.

Azamis Cove, on the south coast of Little Tanaga Island, is about 2 miles long and 1 mile wide at the entrance. Depths are suitable for anchorage, but it is not recommended. The bay provides shelter from the north and west but is open to seas and swells from the Pacific Ocean.

Round Cove, eastward of Azamis Cove, is about 1 mile in diameter, open to the south and southwest, and moderately subject to heavy seas and ground swells. The depths are not too great; therefore anchorage is not recommended.

Chart 9141.—Little Tanaga Strait, between Little Tanaga and Kagalaska Islands, is about 7 miles long and at its narrowest point about 1.2 miles wide; however, the navigable channel between Little Tanaga and Silak Islands has a width at one point of less than 0.5 mile. Tidal currents attain a maximum velocity of 5 knots through the pass east of Silak Island, producing swirls and heavy tide rips north and south of the island. The heaviest rips observed were in the middle of the pass about 1 mile north of Silak Island.

The waters west of Silak Island are foul except for a passage about 0.2 mile wide along the shore of Kagalaska Island, which is recommended only for small boats. Large vessels must pass east of Silak Island. Rip Rock, at the southeast end of the strait, covered 1½ fathoms, is marked by breakers in moderate swells.

To pass through the strait from a position 2.8 miles 270° from Cape Chisak, make good a course of 000°, keeping Silak Island a little on the port bow and heading for Tana Point on Little Tanaga Island. Hold the north course until abeam of Silak Island, then change to 330° and pass through the channel. When abeam of Cemetery Point, a course of 000° may be shaped to pass clear of the strait.

Piper Cove, on the west side of Little Tanaga Island, about 1.8 miles north of Cape Chisak, is open to the west and southwest, but affords temporary anchorage for small vessels.

Tana Bight, an indentation on the western coast of Little Tanaga Island about a mile north of Tana Point, affords temporary anchorage for medium-sized vessels and fair shelter in southerly weather. The bottom is rocky and irregular. Currents in the bight are slight and usually flow in a direction opposite to that of the mainstream current through the strait.

Kagalaska Island, 8 miles long and 5 miles wide, is extremely rugged and mountainous; the highest peak, 2,331 feet, is in the northwestern part. The shores are, in general, steep and rocky except on the west coast, where they have a more gradual slope, becoming steeper inland. The south shore consists of jagged cliffs. The east and north coasts are also steep in many places. The brief stretches of sand or gravel beach are often hacked by ver-

tical cliffs. The coasts are generally clear except the south and southeast coasts and part of the north coast, which are fringed by islets and detached rocks. Several lakes and streams are on the island.

Cabin Cove, opening into Little Tanaga Strait, is a two-armed bay which indents the east coast of Kagalaska Island for 2.5 miles. **Upper Arm**, 1.5 miles long and 0.5 mile wide, is bordered by steep, sloping hills on all sides; it is free of dangers. Approaching the entrance, the 10-fathom curve makes out from the north shore 200 yards, and 100 yards off the low gravel point on the north shore at the entrance. Anchorage can be had in 30 to 40 fathoms in the upper part of the arm. The shores are free of off-lying rocks and shoals. **Lower Arm**, 1 mile long with an entrance width of 800 yards, is smaller than Upper Arm, but most of it is suitable for anchorage. The surrounding terrain, especially at the head, rises in gentler slopes than in Upper Arm, but the summits are over 1,000 feet high. A fresh-water stream flows into the head of the arm.

Crater Cove, on the eastern shore of Kagalaska Island and 1.7 miles north of Ragged Point, affords temporary anchorage in 30 fathoms, sand and gravel bottom. High bluffs and hills on the nearby shore provide good shelter from north and west winds.

Quail Bay, on the south coast of Kagalaska Island, is fringed by steep cliffs to east and west with many rocks along the beach. The bay is deep and clear of dangers to a point about 1.2 miles northwest of Ragged Point. Temporary anchorage for small vessels may be had in 20 fathoms, sand bottom.

Kagalaska Strait separates Adak and Kagalaska Islands. Although narrow, it can be navigated by moderate-sized vessels without difficulty at or near slack water. An 8¼-fathom shoal is in midchannel 1.6 miles inside the south entrance. Southerly winds with ebb currents cause heavy tide rips from the southern entrance north as far as Adak Bight, and are apt to cause a vessel approaching from the south to yaw badly. Because of strong currents, rips and whirlpools are encountered in the narrow parts of the strait except at slack water.

Both north and south entrances are clear, with deep water close to the shores. Care must be taken not to mistake Blind Cove for the north entrance since the former, lying about 1 mile west of the strait, has a much wider appearance. The shores of the north entrance are bold and precipitous while those of the south entrance are relatively low, with outlying rocks. Navigators not familiar with the area are cautioned against attempting an entrance in any but clear weather.

Local magnetic disturbance.—Differences of as much as 11° from normal variation have been observed in Kagalaska Strait near the northern entrance.

Ragged Point, the southeastern extremity of Kagalaska Island, is 4.5 miles eastward of Kagalaska Strait and is an unmistakable landmark for the southern approaches to the strait because of its serrated ridge forming the summit of the point. A natural arch in the tip of Ragged Point is noticeable when the point bears 017°.

Adak Bight, about 2 miles from the south entrance to

Kagalaska Strait, affords good shelter for vessels up to about 100 feet in length. A 3-fathom shoal, marked with kelp, lies 0.3 mile southeastward from the north point of the bight. Vessels approaching from the north should clear this shoal 0.3 mile before turning to enter. Either arm of the bight is suitable for anchoring, but the northernmost affords more swinging room. A shoal lies just off the point between the two arms. In entering either arm, a vessel should keep in midchannel.

Campers Cove, just north of Adak Bight, is suitable only for small boats because of the narrow, shallow entrance. Relatively small vessels can anchor in about 10 fathoms in the indentation just north of Campers Point and thus avoid currents and rips in the strait.

Laska Cove, on the east side of Kagalaska Strait, is deep and well protected. Small vessels usually anchor in the northeast portion of the cove.

Chart 9193.—**Adak Island**, the most important of the Andreanof Group, is about 30 miles long and 20 miles wide at its widest part. The island is rugged and mountainous and has numerous small bays and indentations. **Mount Moffett**, 3,900 feet high, near the northwestern end, is the highest point of the island; it is snow covered the greater part of the year. The island is grass covered on the lower levels; the higher levels have a heavy growth of moss. Small lakes are numerous and there are many small streams.

Chart 9141.—**Boot Bay** is on the south coast of Adak Island about 3 miles west of Kagalaska Strait. The inner harbor has depths of 11 to 35 fathoms over bottom varying from rock to mud; the mud bottom is in the deeper water. Seas and swells from the Pacific Ocean are broken up by the islands in the bay; however, the islands offer little protection from southerly winds. As the land to the north is mountainous there is a probability of williwaws with north winds.

Blind Cove, indenting Adak Island just westward of the north entrance to Kagalaska Strait, is suitable for temporary anchorage only; it is exposed to the northward and is subject to williwaws from the south. A mid-channel course is clear for small vessels to an anchorage in 16 fathoms in the south end of the cove. Caution is necessary to avoid the shoal spots covered 1½ to 6 fathoms off the entrance points.

Kuluk Bay, on the northeast side of Adak Island, is about 4 miles long and 4 miles wide, and is one of the best natural harbors in the Aleutians. It is entered between Zeto Point on the north and Thunder Point on the south, and includes Kuluk Bay proper, Clam Lagoon, Sweeper Cove, Finger Bay and Scabbard Bay. Tidal currents in the bay are weak and the flow appears to depend mainly upon the winds.

Zeto Point is a prominent butte rising well above the surrounding land and has several jagged pinnacles along its southern face. About 1.5 miles northeast of the point is **Head Rock**, which is large and bare.

Kuluk Shoal, consisting of several rocks covered 1¼ to 7 fathoms and marked by kelp, is about 0.8 mile south of

Head Rock and 1 mile eastward of Zeto Point. A lighted whistle buoy is about 0.6 mile east of the shoal.

A 9-fathom shoal with rocky bottom is 0.5 mile 012° from the Head Rock; a 17-fathom bank with rocky bottom is 2 miles 096° from the rock.

Clam Lagoon, 0.5 mile northwest of Zeto Point, can be entered only by small boats. In the southern part of the lagoon and outside the entrance are mudflats. The ruins of a long pier are 0.5 mile west of the lagoon entrance.

A naval restricted area is located in the northwest portion of Kuluk Bay beginning at Zeto Point; limits and regulations are given in 207.802, chapter 2.

Chart 9119.—Sweeper Cove, on the southwest side of Kuluk Bay, provides good shelter in 7 to 20 fathoms inside a breakwater, marked by a light on the outer end, extending from the north side of the entrance; bottom is gray sand.

Gannet Rocks, on the north side of the entrance to Sweeper Cove, are bare and surrounded by shoal water. A detached shoal, covered $3\frac{1}{2}$ fathoms, and a group of small islets, surrounded by shoals, are between Gannet Rocks and the shore. **Gannet Rocks Light** (51°52' N., 176°36' W.), 35 feet above the water, is shown from a small white house on the south end of the largest rock.

Pitt Rocks, on the southeastern side of the entrance to Sweeper Cove, are also bare and surrounded by shoal water. **Finger Shoal**, 0.4 mile eastward of the largest Pitt rock, has a rock that uncovers in the detached shoal area. A lighted bell buoy is 200 yards northeastward of the shoal.

The diurnal range is 3.7 feet in Sweeper Cove. Daily predictions are given in the Tide Tables. It is reported that a heavy surge occurs in the cove following northeasterly gales, making it difficult at times to remain alongside any of the piers.

Harbor regulations.—Sweeper Cove is part of a U.S. naval station. Permission to enter or move about the cove must be obtained from the Naval Port Service Officer who can be contacted by calling ADAK CONTROL on 16 kc. He will assign a berth and provide advisory anchorage service and tug if needed. The pilot advisor will board from a tug in the vicinity of Gannet Rocks. Two 1,500-horsepower tugs and a fleet tug with salvage equipment are available.

Piers 3 and 5, on the north side of Sweeper Cove, are used by vessels drawing up to 33 feet. The two piers of pier 3 and pier 7, west of pier 5, are in disrepair and are not maintained. Pier 10, on the west side of the cove, is the fueling station; depths of 30 to 37 feet are alongside. Pier 11, 300 yards southward of the fueling pier, has a depth of about 8 feet along the south side. Fresh water is available at piers 3, 5, and 10.

Summerhead Cove, on the southern side of Sweeper Cove, has depths of 6 to 24 feet; two small-boat piers are in the cove. A small-boat basin, 0.4 mile westward of Summerhead Cove, was dredged to 10 feet.

Summer Bay, on the south side of Kuluk Bay, is about 1 mile long and 1 mile wide and has two narrow arms

extending in southerly and southwesterly directions. Both arms are open to the northeast but no sea penetrates their narrow entrances. In the outer part of the bay depths are generally too deep for suitable anchorage, although temporary anchorage may be found in about 30 fathoms 400 yards southwest of Lucky Point and in 24 fathoms off the entrances to the two arms.

The southwest arm is narrow but clear in midchannel, with a least depth of 5 fathoms. Piers at the head of the arm have depths alongside of 24 to 37 feet. Holding ground off the docks is good.

Scabbard Bay, just eastward of Finger Bay, is open to the northward. Anchorage can be had near the entrance in 20 fathoms, gray sand and broken shell bottom. At the south end of the bay is good shelter in 15 to 20 fathoms, brown mud bottom. Fresh water is obtainable. Mid-channel courses will avoid all dangers.

Chart 9193.—**Cape Adagdak**, the northernmost point of Adak Island, is a bold headland 2,072 feet high. From Cape Adagdak the coast trends southwestward and then curves westward to form 3-mile-wide **Andrew Bay**. A 20-foot-high rocky dike separates the head of the bay from fresh water **Andrew Lake**.

Acorn Rock is 0.2 mile off the north coast of Adak Island, 5.5 miles southwestward of Cape Adagdak. A shoal covered 1 fathom is 0.4 mile offshore 0.6 mile westward of the rock.

Cape Moffett, 8 miles southwestward of Cape Adagdak, is a cliff 600 feet high behind which the land rises gradually to Mount Moffett. The cape is the northwest headland of Adak Island and is prominent for entering Adak Strait. **Cape Kiguga**, 2 miles south of Cape Moffett, is the westernmost projection of Adak Island at the north entrance to Adak Strait; it is a very steep eroded slope rising abruptly from the water. The 30-fathom curve extends about a mile off Cape Moffett and Cape Kiguga; there are no off-lying dangers.

Adak Strait, between Adak Island and Kanaga Island, is 16 miles long and from 6 to 8 miles wide; depths are from 30 to over 100 fathoms. The only dangers are the rocks and reefs off **Eddy Island** and **Argonne Point** on the east side and **Shoal Point** and **Naga Point** on the west side. Vessels should clear both shores of the strait by not less than 1 mile. Since the current velocity may reach 4 knots, passage in heavy fog without radar is not recommended. See Tidal Current Tables for daily predictions.

The coast of Adak Island along the east side of Adak Strait is bordered by steep bluffs and rocky cliffs; islands, rocks, and reefs lie close to shore. **Eddy Island**, at the north entrance, is prominent. **Whirlpool Rock**, 1 mile northeastward of Eddy Island, is small, flat on top, and awash at extreme high tides; kelp grows close to it. Currents are strong and erratic in this area. **Wedge Point**, a rocky bluff 7.5 miles southward of Eddy Island, is prominent. A good anchorage for small vessels in southerly weather is 0.8 mile east of Wedge Point, 0.3 mile offshore in 17 fathoms, sand bottom. The point 9.5 miles southward of Eddy Island resembles the head of a huge gorilla.

The coast of Kanaga Island along the west side of Adak Strait is fringed by kelp beds, islets, and rocks. There are several anchorages which provide protection from westerly weather. One is in the cove between **Round Head** and Shoal Point; another is midway between Shoal Point and Naga Point in 17 fathoms, gray sand bottom. A reef covered 6 fathoms is 1 mile northeast of Naga Point and 0.8 mile offshore; another reef covered 13 fathoms is 0.7 mile east of the point. When the current is ebbing heavy tide rips occur on these reefs in southerly weather.

Cape Chlanak, on the west side of the southern entrance to Adak Strait, is low and rocky. Shallow water marked by kelp lies close to the shoreline. Currents are strong and medium tide rips occur off the point.

Chart 9121.—Shagak Bay, 3 miles southeastward of Cape Kiguga, has depths of 20 fathoms or more, but only 4 feet can be carried through the 400-yard-wide entrance between grass-covered sandspits. A band of very heavy kelp extends across the entrance; the bar is relatively smooth rock. The bay is well protected from swells; the bottom is mud and probably fair holding ground. Violent williwaws and gales are encountered in easterly and southeasterly weather. A good weather anchorage is indicated 1 mile northwest of the entrance and 0.7 mile offshore in 17 fathoms, flat sand bottom.

Chart 9120.—Bay of Islands, on the northwest side of Adak Island, is protected by the many islands at the entrance; wide-drag depths of 34 feet or more are in the main passages. The bay is about 6 miles long in a south-east direction and varies in width from 3 miles at the entrance to less than 1 mile at the southeast end. Although the bay is protected from sea swells, violent and severe gales occur, especially with winds from east and south.

The approaches to Bay of Islands are clear to within 500 yards of **North Island** on the east and **Careful Point** on the west. Currents are strong near Careful Point. **Cascade Rock**, in about the middle of the entrance, is only 2 feet high and breaks in heavy weather; shoal water surrounds the rock.

The preferred passage to **Expedition Harbor**, in the southeast part of Bay of Islands, is west of **Green Island** through **The Race** between the west end of **Ringgold Island** and **Plum Island Rocks**, thence through **Ringgold Sound** and **Hell Gate**.

The Race is dangerous because vessels must pass close to Plum Island Rocks. A speed of 8 to 10 knots is essential for a large single-screw vessel to make the necessary changes in course.

Hell Gate narrows to about 70 yards and is dangerous for a large vessel in case of strong beam winds or mechanical failure.

At the eastern end of Hell Gate, the kelp-covered rocks on the south side and **Eaglet Rocks** on the north narrow the channel, making it particularly difficult for an outgoing vessel because it is necessary to head for **Eaglet Rocks**, and, when the rocks are close at hand, make a

sharp turn in order to pass through the deep and narrow part of Hell Gate.

Expedition Harbor can be reached through **Argonne Channel**, north of **Ringgold Island**, but this passage is dangerous because the reefs at the turn northward of **Black Island** narrow the channel width to 90 yards.

Vessels can anchor in the western or eastern parts of Expedition Harbor. The main part of the harbor, with depths of 30 to 85 fathoms, is too deep for anchorage. Anchorage areas: **Unalga Bight**, at the west end, in 16 to 25 fathoms, mud bottom; **Gannet Cove**, at the east end, in 18 to 25 fathoms, mud bottom; and **Beverley Cove**, northward of Gannet Cove, in 10 to 18 fathoms.

An excellent anchorage for small vessels is in **Fisherman Cove**, on the south side of **Ringgold Sound**, in 10 to 22 fathoms, mud bottom.

Anchorage can also be had on the south side of **North Island** in 20 fathoms or more, mud and rock bottom. The area can be reached by passing westward of **North Island** until past **North Rocks**, thence a 110° course between shoal spots of 3¼ fathoms on the north and 4 fathoms on the south to the anchorage.

Fresh water can be obtained from several waterfalls in the Bay of Islands. The waterfall 0.3 mile southeastward of **Vincennes Point** has the most accessible natural water supply in the bay.

Chart 9121.—Three Arm Bay, on the west side of Adak Island, has depths of 19 fathoms or more in the outer part, but the depths decrease to less than 5 fathoms in the arms. Most of the covered dangers are within 300 yards of the shore. In southerly weather small vessels can anchor 0.3 mile east of **Three Sisters Island** in 17 fathoms, sandy bottom. **North Arm**, 0.2 mile wide with steep sides, extends 2 miles inshore to a low draw. A short overland trail leads from the upper end of the arm to the south shore of **Unalga Bight** in the Bay of Islands. In southwesterly and westerly weather, swells from Adak Strait enter **North Arm**; in easterly or westerly weather, winds draw through this arm. Anchorage is suitable only for small craft in good weather. A fair anchorage for small vessels is in **Middle Arm**, 0.5 mile north of **Split Point**, in 20 fathoms, but the sand and rock bottom is poor holding ground. **South Arm** is an excellent anchorage for small vessels and launches in 12 fathoms, sand and mud bottom. It is entered from **Middle Arm** through a 6-fathom passage between the west shore of the small island off **Split Point** and the shoreline to the westward. The passage is foul between **Split Point** and the island off the point.

Chart 9193.—Bay of Waterfalls, on the south side of Adak Island just east of Adak Strait, is 8 miles long and 5 miles wide at the entrance but narrows to 0.5 mile at the north end. Depths of 10 fathoms or more are within 0.3 mile of the shore, except for a pinnacle rock, covered 1½ fathoms, 5.5 miles inside the bay at a point 0.5 mile west of **Low Point**. Most of the bay is too deep for anchorage; it is exposed to the seas and swells of the Pacific Ocean and to heavy gusts sweeping through the mountain

passes of Adak Island. Vessels can anchor in 18 fathoms within 0.5 mile of the head.

Cape Yakak, on the west side of the entrance to Bay of Waterfalls, is a long, flat tableland, well defined and easily recognized because it has no high peaks on it. **Cape Yakak Light** (51°36' N., 176°57' W.), 104 feet above the water, is shown from a small white house on the cape.

Chapel Roads (chart 9121), the eastern arm of Bay of Waterfalls, offers anchorage in 20 fathoms, rocky bottom, but is also exposed. **Chapel Cove**, the inner bight of Chapel Roads, affords temporary anchorage in 10 fathoms, hard to soft gray sand bottom. The entrance is narrow, being restricted by **McCulloch Rock**, a pinnacle covered 2½ fathoms, on the north side of the cove. **Pulpit Rocks**, inside the cove, are a ledge of bare rocks.

Cataract Bight, on the east side of Bay of Waterfalls near its head, affords anchorage in 24 fathoms 200 yards off the beach; fresh water can be obtained. A perceptible swell reaches the bight with southerly winds.

Hidden Bay, 12 miles northeastward of Cape Yakak Light, is a 0.1-mile-wide inlet 1.2 miles long with depths of 10 fathoms or more in midchannel; high hills are on both sides. Small boats will find good shelter in the west arm at the north end of the bay in 11 fathoms, mud bottom. A 6-foot-high rock, 0.6 mile south of the entrance marks a foul ground area with deep channels on either side; boats should keep well clear of the eastern entrance point.

Chart 8863.—Kanaga Island, across Adak Strait from Adak Island, is roughly right-angled and extends 18 miles north and south, 28 miles east and west, and has a maximum width of 7 miles. **Kanaga Volcano** (chart 9193), at the north end of the island, is cone shaped, rising directly from the water to 4,416 feet; steam may emit near the summit. In clear weather this excellent landmark is visible from all directions. There are several lesser peaks south of the volcano from which the land slopes down abruptly to rolling tundra-covered hills, 600 to 100 feet high, interspersed with numerous streams and lakes. The Bering Sea Aerological Unit stationed at Kanaga Bay found that the Kanaga Volcano could be utilized as a means for forecasting bad weather. The volcano peak is seldom absolutely clear of clouds. During April 1934, it was observed that invariably the day or night before a gale the peak made its appearance, shorn of all clouds and with wisps of steam around the crater. During the summer of 1953, the phenomenon was noted on several occasions, but it is not infallible, as evidenced at other times when bad weather did not follow clear visibility of the peak.

Chart 9193.—Most of the north coast of Kanaga Island between Cape Miga and Round Head is fringed by kelp, small islets, and rocks. Depths of 100 fathoms reach within 0.5 mile of shore from Cape Miga for 2 miles seaward, where the shoreline trends southeastward for 3 miles to Round Head, and depths of 30 fathoms reach within 1 mile of shore. The water over this relatively

shoal area appears much disturbed and currents are strong and erratic.

False Bay (51°43' N., 177°09' W.), 0.5 mile northward of Cape Chlanak, has landing places protected from all but heavy southeast swells on the sand beaches at the head of its two arms. The bay may be used as an emergency anchorage for very small vessels, in 8 fathoms, sand bottom, and affords protection from west and north winds.

Chart 9121.—Kanaga Bay, on the south coast of Kanaga Island 2 miles west of Cape Chlanak, is 2 miles long and 0.4 mile wide with depths of 10 to 3 fathoms, except for the shallow northern part which nearly dries in places. The hazardous entrance channel is only 130 yards wide between reefs plainly marked by kelp.

The shoreline of Kanaga Bay consists of rocky cliffs or steep grassy bluffs, with a sand beach and low ground at the head. Good anchorage is afforded medium-sized vessels in shallow water, with excellent holding ground of sticky mud mixed with black sand. The anchorage is protected from all winds except southeasterly, and the bay is apparently not subject to williwaws, the heaviest gusts coming from northeast. With heavy swells from south through southeast, the entrance is impassable, and it should never be attempted without good visibility.

The wreck of the USS SWALLOW on the west side of the entrance to Kanaga Bay is prominent and appears red in color from offshore. If any appreciable swell is running, the sea breaks on both sides of the entrance channel near the wreck.

In 1954 the outer part of the dock at the abandoned site, 1.4 miles above the entrance of Kanaga Bay, was in fair condition; small vessels could berth along its face where the depth is 13 feet. The dock has been gutted by fire near the beach end and buildings along the waterfront have been burned. A prominent radio mast on a hill 175 yards northeast of the inner end of the dock is visible throughout the bay. A cabin is located across the bay northwest of the dock.

Chart 8863.—The south coast of Kanaga Island is low, rocky, and very broken with numerous offshore rocks and reefs marked by kelp fringing the shore. The coast should be cleared by at least 2 miles to avoid the dangers.

The waters off **Cape Tusik**, 3 miles westward of Kanaga Bay, appear much disturbed with strong currents. A dangerous shoal extends south-southwestward for 2 miles off the prominent headland 2 miles northwestward of Cape Tusik. Depths of 16 fathoms are on the outer part, decreasing to much shallower depths closer inshore.

Chart 9145.—Sentry Rock, 9 miles westward of Cape Tusik and 1 mile off the south coast of Kanaga Island, is 94 feet high and prominent. Passage between the rock and the shore should not be attempted.

Cape Chunu, the southwestern end of Kanaga Island, has grassy bluffs and rocky cliffs 100 to 200 feet high; rolling grassland is in the interior with hills up to 345 feet high. The shoreline is rugged and rocky; rocky reefs

and prominent rock islets and pinnacles fringe the shore. **Castle Island**, a small grass-covered rocky islet off **West Chunu Point**, is 165 feet high and prominent from the southeast and northwest. Vessels are cautioned to pass at least 1.5 miles off Cape Chunu to avoid the shoal area of very irregular rocky bottom with depths of 2 to 6 fathoms. The waters for several miles south of the cape are usually much disturbed, indicating strong currents.

Kanaga Pass, between Kanaga Island and Tanaga Island, is 3.8 miles wide at its narrowest part, but it is full of small rock islets, dangerous reefs, and strong currents; passage is not recommended except during periods of good visibility and calm seas.

Foul ground extends into Kanaga Pass for over 1 mile from the west side of Cape Chunu to more than 3 miles off **Western Point**, Kanaga Island, thence over 1.5 miles offshore along the north coast of Kanaga Island. **Eddy Rock**, **Goose Rocks**, and **Annoy Rock**, a part of the foul ground, are prominent. A dangerous reef, covered 1 to 3 fathoms, is 0.4 mile northward of Annoy Rock. The dangerous area from this reef eastward to Kanaga Island is rocky and very irregular; many underwater pinnacles exist. The kelp which marks the area during the summer is towed under by the current except at slack water and cannot be relied upon to indicate the shoals.

Cape Sasmik, the south end of Tanaga Island on the west side of Kanaga Pass, is a relatively flat grassland with steep grassy bluffs and rock cliffs rising abruptly from the shoreline to 100 feet. Rocky islets and reefs border the coast close inshore. **Herd Rock** (Chart 9146), a 20-foot detached black rock on the southwestward side of the cape, is conspicuous from the southeast and northwest. The cape should be cleared by at least 1 mile.

Foul ground extends up to 1 mile off the Tanaga Island shore on the west side of Kanaga Pass, except in the approach to Twin Bays. The bottom is very broken and irregular, and the shoreline is made up of low cliffs.

A good anchorage in westerly weather is 3 miles north of Cape Sasmik and 0.8 mile offshore in 18 fathoms, sand bottom; Twin Bays is also a good anchorage.

Trunk Point, 11 miles northeastward of Cape Sasmik, shows as a low rounded knoll.

Cape Sudak, the long finger-shaped easternmost point of Tanaga Island on the north side of the north entrance to Kanaga Pass, terminates in a small flat-topped, steep-sided 70-foot-high promontory which appears detached from offshore. A dangerous shoal, with bare rocks, extensive heavy kelp, and underwater pinnacles, extends 2 miles northeastward from the cape. The waters from the shoal to the 100-fathom curve appear greatly disturbed. The cape should be cleared by over 2 miles.

Anchorage protected from westerly and northerly swells is 1 mile southeastward of the end of Cape Sudak in 20 fathoms, flat cinder bottom.

The current velocity may reach 4 knots in the narrow part of Kanaga Pass. In calm weather, tide rips are visible among the covered reefs between Annoy Rock and Kanaga Island. With a heavy southerly swell and the

current ebbing southward, seas break across the entire pass. See Tidal Current Tables for daily predictions.

The recommended routes through Kanaga Pass with depths of 10 fathoms or more are through **Explorer Passage**, between Annoy Rock and **Hazard Point**, Tanaga Island, thence either midchannel between Kanaga Island and Tanaga Island, or the 0.3-mile-wide passage through **The Ditch** between dangerous **Eider Reef**, awash in places at half tide, and **Trunk Point**, Tanaga Island.

Twin Bays, 5 miles north of Cape Sasmik, is a good small-boat anchorage in westerly and northerly weather; larger vessels may anchor just off the entrance. A 75-foot-high distinctive rock resembling a Christmas tree in profile outline, undercut by surf action to balance on a small pedestal, is on the beach at **Christmas Tree Point**, on the west side of the entrance. The shores on both sides of the entrance to the bay are 100-foot-high vertical cliffs with reefs extending more than 0.1 mile into the bay; the surrounding country is rolling grassland. Foul ground extends 0.7 mile southward of Christmas Tree Point.

A houlder beach, with a very shallow valley beyond, is at the head of the northeast arm of Twin Bays; a sand beach backed by a narrow, deep valley is at the head of the northwest arm. A trapper's cabin is near the beach in the northwest arm, and a stream empties into this arm about 150 yards east of the cabin.

Small vessels can anchor in Twin Bays in 8 fathoms, flat sand bottom, when the Christmas tree rock bears 242°. Larger vessels should anchor in 16 fathoms, flat sand bottom, 0.6 mile off the rock when it bears 310°.

Chart 9121.—Hot Springs Bay, on the Tanaga shore of Kanaga Pass 12 miles northward of Cape Sasmik, is small but offers good protection from westerly weather. Low bluffs line the south shore with a rise at the head to a high ridge. Warm springs are along the central part of the south shore. The north shore is lined by steep bluffs rising toward the mountains; a prominent waterfall is 0.3 mile from the head. A good sand beach is at the head at the foot of a low valley; a stream enters the bay at the south end of the beach. Two cabins are just in back of the beach near its northern end.

The only off-lying danger in Hot Springs Bay is **Village Reef**, 600 yards off the south shore 1 mile northwestward of Trunk Point. Good anchorage is found in 13 to 17 fathoms, sand bottom; small craft may anchor in shoaler water close to the beach.

Charts 8863, 9193, 9145.—The north coast of Kanaga Island westward of Cape Miga trends southward for 7 miles, then southwestward for 20 miles to Kanaga Pass. From Cape Miga for 7 miles southward to **Bellevue Beach**, the coast is steep to with off-lying dangers within 0.5 mile of the shore. The 2-mile sand beach is backed by low ground and dunes. Good anchorage is afforded in southeasterly weather off the beach; avoid the several detached offshore rocks. Landings can be made on the beach.

The coast between Bellevue Beach and Kanaga Pass is generally rocky and irregular, with a wide band of kelp and rocks parallel to the shore. Most of the points of land are low rocky cliffs; steep grass bluffs between the points rise to the relatively flat and rolling interior. The coast should be given a clearance of 1.5 miles to avoid the dangers.

Ship Rock, 1 mile offshore and 5 miles west of Bellevue Beach, is 49 feet high and resembles a ship; foul ground is between the rocky islet and the shore. Good anchorage in southerly weather can be had 4.5 miles westward of Ship Rock in the cove west of **Cabin Point** in 18 fathoms, smooth sand bottom; approach with caution to avoid the covered rocks and pinnacles off Cabin Point and Placer Point. A trapper's cabin is on the west side of Cabin Point. A group of pinnacles, covered 7 to 25 feet and marked by kelp, is 0.4 mile off double-ended **Pincer Point**, 5.2 miles westward of Ship Rock.

Hive Rock, 7.5 miles westward of Ship Rock and 0.4 mile offshore, is an 80-foot-high hive-shaped pinnacle. Heavy kelp lies between the rock and the shore. Good anchorage is afforded in southerly weather 0.6 mile north-east of the rock in 20 fathoms, smooth sand bottom; approach should be made from the north. A rock that uncovers and marked by kelp is 1.3 miles offshore, 8.7 miles westward of Ship Rock; foul ground is between the rock and the shore.

A prominent 60-foot-high twin-pinnacled rock is 0.3 mile off **Northwest Point**, 10.2 miles westward of Ship Rock. **Coolie Hat**, 1.3 miles southeastward of Northwest Point, is a prominent 284-foot black cinder hill shaped like the crown of a coolie hat.

Chart 9145.—**Bobrof Island**, 6 miles northeast of Cape Sudak, Tanaga Island, is more than 2 miles long and almost 2 miles wide. The shoreline on all sides except the north is rocky and precipitous, with steep slopes rising abruptly to 2,420-foot **Bobrof Volcano**. The north point of the island, connected by a low grassy area to the base of the volcano, consists of a very prominent flat-topped 400-foot-high cylinder-shaped peak of black lava having bare vertical sides. It appears to be separated from the rest of the island when viewed offshore from the east or west. Currents are strong on all sides of Bobrof Island and the waters appear disturbed for 1 mile offshore. Dangers are within 0.2 mile of the shore; the 10-fathom curve is less than 0.5 mile offshore. A band of impenetrable kelp parallels the northwest coast to 0.3 mile offshore.

Chart 8863.—**Tanaga Island**, across Kanaga Pass from Tanaga Island, is irregular in shape with greatest north-south length of 20 miles and east-west width of 23 miles. The northern part of the island is high and mountainous, while the southern part is low with many streams and small lakes or ponds. The north shore has precipitous rocky cliffs or very steep slopes which rise to the interior mountains. The other shores are rocky cliffs or reefs with numerous along shore pinnacles, except for beaches on Tanaga Bay and a few other places. The south coast and much of the east coast of Tanaga Island are fringed

with detached rocks, reefs, and foul ground. Extensive kelp patches are in the foul areas. The dangers can be avoided by clearing the coast by over 2 miles.

Chart 9145.—The first 12 miles of the north coast of Tanaga Island between Cape Sudak and **Gage Point** is indented with coves that provide anchorage. The 30-fathom curve is 1 mile or less offshore; all dangers are within 0.5 mile of the shore.

Portage Bight, 5 miles west of Cape Sudak, affords a good weather anchorage in 18 fathoms, sandy bottom.

Rough Bay, 8 miles west of Cape Sudak, is not recommended as an anchorage because of violent williwaws in southerly and westerly weather. A dangerous rock, 0.4 mile northeast of the western entrance point, is awash at low water. A large shoal area, marked by kelp, makes out from the southeast shore to the middle of the bay. A sand beach is at the head and a deep valley extends inland.

Gusty Bay, 10 miles west of Cape Sudak, affords good anchorage in southerly weather. The gusty winds frequently encountered do not, as a rule, impair safe anchorage. Two shallow valleys, separated by a bold headland, are at the head of the bay; a trapper's cabin is in the southeast corner at the mouth of a large stream.

Pillbox Rock, 0.1 mile off the steep-sided, square-faced east entrance point to Gusty Bay, is a 150-foot-high conspicuous dome-shaped pinnacle with grass on top; a 50-foot-high sharp-pointed pinnacle is just north of it. All dangers are within 0.5 mile of the shore. Anchor in the center of the bay with the sharp pinnacle bearing 118°, in 16 fathoms, sand bottom.

Chart 9146.—The north coast of Tanaga Island between **Gage Point** and **Cape Sajaka** is very irregular with many vertical lava cliffs. A large waterfall, 2.5 miles west of **Bumpy Point**, is 348 feet high and pours from the top of a vertical cliff. Dangers are within 0.5 mile of the shore. Currents are strong along this stretch of coast.

The two prominent peaks in the interior are connected by a saddle; the eastern one is about 4,600 feet high and the western, **Tanaga Volcano**, is 5,925 feet high.

From Cape Sajaka southeastward to Tanaga Bay several shallow valleys with black sand or gravel beaches across them indent the otherwise mountainous interior. **Blackface Point**, 7 miles southeastward of Cape Sajaka, is a prominent headland with black rock cliffs near the top of steep grassy bluffs. Dangers are within 0.5 mile of the shore. In good weather vessels may anchor 3 miles north-west of Cape Agamsik, 0.8 mile off the sand beach, in 15 fathoms, flat sand bottom.

Tanaga Bay, on the west side of Tanaga Island, affords protection from all except westerly weather. The bay is a good anchorage for large and small vessels; depths and places can be selected as desired. The bottom is uniformly fine, black, hard sand with only fair holding qualities in heavy weather. The head of the bay shoals gradually from 2 miles out to a sand beach. The south shore is irregular with reefs and kelp beds. Dangers are within 0.7 mile of the bay shore. Several visible rocks on

head of the bay, are of some assistance when anchoring near the head.

Cable Bay, a small cove on the north side of Tanaga Bay east of prominent Cape Agamsik, affords protection to small craft in westerly weather. Fresh water is available at the head of the bay.

Cape Amagalik, on the south side of the entrance to Tanaga Bay, is low but backed by higher grassy hills. A shoal with a least depth of 13 fathoms extends 1.5 miles off the cape. A dangerous reef, marked with heavy kelp and rocks, is inside the shoal area. Tide rips are severe off the cape. All vessels should clear the cape by at least 4 miles when a moderate swell is running against the current. Small vessels should not attempt passage with a heavy swell running. Seas 12 to 14 feet high have been encountered in the area in moderate weather. A flood current of 3 knots has been observed; larger velocities probably occur. The flood sets northward and the ebb southward.

Tide rips have been observed on the 26-fathom bank 4 miles northwestward of Cape Amagalik.

A skeleton tower on top of a 145-foot bluff on the south side of Cape Amagalik and **Harem Rock**, 0.6 mile southwestward of the tower and usually marked by heavy breakers, are prominent.

Lash Bay, 3 miles east by south of Cape Amagalik, is the site of an abandoned World War II military installation. Only small craft should enter the bay, and then with caution under favorable weather conditions. The inshore portion of a 600-foot wharf remains at the head of the bay; a depth of 8 feet is off its outer end. Broken piling of the outer portion of the wharf is covered and constitutes a real danger. Two diamond-shaped targets set on a hill just westward of the wharf form an entrance range on course 002°. A shoal covered less than 3 fathoms is in the approach on the range line extended; dangerous covered rocks are near both sides of the range line approaching the head. The bay is useful only as a temporary anchorage because of limited swinging room and shoal water.

Scarab Rock, 0.6 mile west-southwest of Tidgituk Island, is 50 feet high and prominent.

South Bay, on the south coast of Tanaga Island just west of Cape Sasmik, affords anchorage during northerly and easterly weather. A reef that uncovers extends 0.5 mile southward from the center of the head of the bay; a shoal with depths of 7 to 2 fathoms continues southward for another 0.5 mile. A trapper's cabin is near the mouth of a stream northeastward of the reef. Anchor in the eastern half of the bay, 0.5 mile off the east shore, in 12 fathoms, flat sand bottom.

Chart 8863.—**Tanaga Pass**, between Tanaga Island and the Delarof Islands, is 13 miles wide at its narrowest part. Depths of 50 fathoms or more can be carried through the pass by keeping 6 miles off Cape Amagalik, Tanaga Island, and 3 miles off the Delarof Islands.

Currents.—The direction and velocity of the current is radically affected by the land areas and the banks. It

appears that the flood is diverted by the chain of islands—Skagul to Unalga—and the relatively shoal water between them to an east and west direction in moving around this chain. It was observed that south of Skagul Island the flood sets about northeast, east of this island it sets north, and north of the island it sets north to northwest.

With erratic currents of this nature, dead reckoning cannot be depended on and the navigator may find his vessel a mile or more off his reckoning after a run of 1 hour.

During observations made 4.5 miles southwestward of Cape Amagalik, the current was rotary, turning clockwise, and followed a definite pattern. A minimum current averaging about 0.8 knot sets north to northeast. As the current turned through east to south the velocity built up rapidly until it reached 3 knots. The velocity decreased to about 2 knots and at time of low water set west-southwest. The current turned northwestward, and the velocity increased to a maximum of 3 knots. The current continued northwestward to north until the velocity averaged about 0.8 knot. The current then set northwestward at a velocity of 2 knots. The current turned through north to northeast and decreased in velocity to a minimum of 0.8 knot.

On the opposite side of the pass, 4 miles eastward of Ugidak Island, velocities of over 3 knots were observed.

Between Kavalga and Ulak Islands, the flood was observed to set to the northwest.

Tide rips and swirls may be encountered in any part of this area, except well off the land areas in deep water. Generally they will be encountered where a radical change in depth deflects the natural flow of the current or where land masses affect this flow. The ebb appears to produce the heaviest rips and they are most pronounced during the greatest range of tides. Also, strong winds and heavy seas, opposing the flow of the current, cause large rips.

Rips and swirls were observed by survey vessels to be particularly heavy to a distance of approximately 4 miles westward of Cape Amagalik. This area is dangerous to small craft except in favorable weather and should be avoided by medium-sized craft under adverse conditions of current and sea or swell. Under unfavorable weather conditions, it is advisable to round this cape outside the 50-fathom curve.

Heavy tide rips have been observed off Cape Sajaka on the bank between Skagul and Ilak Islands; and on the shoal extending west from Unalga Island.

See Tidal Current Tables for daily predictions.

The Delarof Islands, between Tanaga Pass and Amchitka Pass, are a group of nine islands and several small islets and rocks covering an area of 38 miles north-south and 33 miles east-west.

Ilak Island, the easternmost in the Delarof group, is 188 feet high on a ridge near the northeast shore. The highest bluffs are on the north and east sides. From offshore the island appears tablelike; the top slopes gently from east toward the west shore. The shoreline is broken

and surrounded by detached islets, rocks, and reefs up to 2 miles west of the island and 0.5 mile on the other sides. **Cramp Rock**, 1.5 miles west of Ilak Island, is the breeding ground for sea lions. The 15-foot-high pinnacle 0.5 mile off the north shore of the island is prominent. Strong currents and tide rips are near the island.

Ugidak Island, the easternmost of a chain of four islands in the central part of the Delarof group, is 75 feet high, small, and rocky. The waters around the island are deep; currents are strong and tide rips, dangerous to small boats, may be encountered.

Skagul Island and Ogluga Island, 2.5 to 7 miles west of Ugidak Island, are surrounded by numerous rocks, reefs, and kelp beds. An emergency landing field and buildings are on Ogluga Island; a tower near the north shore is prominent.

Skagul Pass, between Skagul and Ogluga Islands, is only for small craft. Currents in the pass are very strong and tide rips develop when sea and current are opposed. Kelp in the pass is towed under when the current is running.

A good anchorage from northerly weather is 1.2 miles south of Skagul Pass in 17 fathoms, sand and gravel bottom.

Tag Islands, a group of rocky islets 3 miles southwest of Ugidak Island, are the breeding grounds for sea lions; the highest point is 75 feet. Several rocky islets are between these islets and Skagul Island.

Kavalga Island, 10 miles westward of Ugidak Island, is 3 miles long with greatest width of 1.5 miles; the highest point is 315 feet. The 1-mile-long prominent headland at the western end of the island is 180 feet high and connected to the mainland by a low gravel bench. Most of the island is covered with tundra. The shores are fringed with prominent rocks and reefs.

There are several reefs and rocks, large kelp beds, and leading channels 2 to 5 fathoms deep between Ogluga Island and Kavalga Island. Large numbers of sea otter have been seen in this area. **Ogluga Pass**, close to Ogluga Island, is only for small craft.

Otter Pass, 0.7 mile northeast of Kavalga Island, has depths of 5 fathoms in the 0.4-mile-wide channel. The pass is fringed with heavy kelp and prominent 3-foot-high rocky islets; some kelp grows in the channel. Currents in the pass are moderate.

A good anchorage during southerly gales is 1 mile north of Kavalga Island in 22 fathoms, sand and gravel bottom. A bank with a least depth of 18 fathoms is between Kavalga Island and Unalga Island. Currents in this area are very strong; dangerous tide rips develop when the wind and current are opposed. The waters are especially dangerous for small boats; under extreme conditions the area may also be dangerous for larger vessels. Using the pass should clear Kavalga Island and Unalga Island by not less than 2 miles.

Unalga Island, the westernmost of the central Delarof group, is 240 feet high, grass covered, rimmed with steep cliffs and flat on top. The shore is fringed by rocks and reefs. Prominent are a 50-foot-high rock 0.5 mile north-

west of the island and **Dinkum Rocks**, 0.8 mile southwest of the island.

Gareloi Island, the northernmost of the Delarof group and 20 miles westward of Tanaga Island, is almost circular and about 5 miles in diameter. **Mount Gareloi**, a 5,160-foot active volcanic crater, is located near the center at the summit of the island; a smaller peak is south of the summit. The land slopes steeply to the summit, except near the northwestern side where the slopes are more gradual. The island consists of lava rock, black lava, eroded lava, and ashes; the lower slopes and valleys are covered with grass and tundra in many places. The shores have steep cliffs with rocks and boulders at the base; boulders, pinnacles, and rocks awash extend around the shoreline. Heavy kelp surrounds most of the island, extending offshore to 10 fathoms. Depths of 10 fathoms or more are within 0.5 mile of the island.

A trapper's hut is on the beach above the north shore of Gareloi Island. In moderate weather the survey ship anchored off the lee shore in the bight on the southeast side, 800 to 1,000 yards offshore, in 25 to 35 fathoms. The current velocity is about 0.5 knot off the southeast shore and sets northeastward and southwestward.

Local magnetic disturbance.—Differences of as much as 4° from normal variation have been observed on Gareloi Island southeast of Mount Gareloi.

Ulak Island and Amatignak Island, 3 miles apart, are the southernmost of the Delarof group.

Ulak Island is irregular in shape, 6 miles long, and over 3 miles wide at the center. There are two high points on the island—one on the ridge near the north shore and the other toward the southern part of the island. Numerous rocks and islets border the island; several reefs lie close to shore and near the off-lying rocky islets. Strong currents and tide rips have been observed as far as 3 miles southeast of the island. **Pratt Cove**, on the west side of the island, can be used as an emergency anchorage; currents are noticeable and the bottom is rocky. **Patton Cove**, on the south coast, is a good anchorage for north and northwest weather; there is very little current and the bottom is sandy.

Tanadak Island, 1 mile off the west coast of Ulak Island, is low and not prominent. A prominent 30-foot rock is 0.2 mile northwest of the island. The survey ship used an anchorage 0.7 mile east of the island.

Ulak Pass, between Ulak and Amatignak Islands, is 3 miles wide and has depths of 35 fathoms or more. The current velocity is over 2 knots in the pass and sets northwestward and southeastward. A midchannel course should be followed to avoid the rocks and islets near the shores of the islands.

Amatignak Island, the southernmost of the Aleutian Chain, is within 40 miles of the Seattle-Yokohama composite course. The rugged island is 5 miles long and 3 miles wide; the high tundra-covered hills and bare ridges and mountains of the interior rise to a height of 1,875 feet. The shores are generally steep and fringed with rocks; the west and northwest coasts are steep-to.

Knob Point, a peninsula with a conspicuous knob-shaped

hill, is on the east side of Amatignak Island. **Ulva Cove**, just north of Knob Point, is used as a small-boat anchorage. The survey ship anchored off the entrance in 25 fathoms. Protection is fair from west and southwest gales except when there is a south or southeast swell from the Pacific. A boulder beach is in back of the cove and a trapper's cabin is on the small flat area at the head. A prominent waterfall is 1 mile north of the cove.

Nitrof Point, a rocky peninsula at the south end of Amatignak Island, is narrow and steep with conspicuous off-lying pinnacles. A rock awash with frequent breakers is 0.5 mile south-southwest of the most southerly pinnacle rocks. A foul area extends 0.6 mile offshore midway between Nitrof and Knob Points.

The western coast of Amatignak Island is very broken with prominent pinnacle rocks, steep cliffs, and small coves; rocks awash fringe the shore. A prominent 170-foot dome-shaped pinnacle off the northwest coast makes a good landmark. A small deep cove on the northwest coast affords the best protection for landings on the west side of the island.

Amchitka Pass, between the Delarof Islands and the Rat Islands, has a least width of 50 miles and depths of 49 to over 1,000 fathoms. The islands on both sides of the pass should be cleared by at least 5 miles. Heavy tide rips have been observed off the east end of Amchitka Island. The pass is dangerous in heavy weather, particularly for small and medium craft; currents appear erratic in direction and velocities may be strong. This may account for reports of very large seas and strong tide rips.

Chart 8864.—The **Rat Islands**, between Amchitka Pass and **Murray Canyon**, are a group of six large islands and several smaller ones covering an area of 47 miles north-south and almost 100 miles east-west. Strong williwaws frequently occur on the leeward sides of the northern islands during periods of light to moderate breezes on the windward sides. Areas of clear weather are often found on the leeward sides during periods of heavy fog.

Chart 8863.—**Semisopochnoi Island**, the northeasternmost of the Rat group, has a north-south length of 9.5 miles and an east-west width of 11 miles. The numerous rugged ridges and peaks, 1,200 to over 4,000 feet high, surround an interior valley with a small lake 300 feet above sea level. Most of the peaks or cones have deep craters and appear flat-topped from offshore. The shore is almost entirely steep cliffs or bluffs fringed with a narrow, rough, boulder beach; kelp is alongshore. Dangers are within 400 yards of the shore, but the island should be cleared 1 mile or more. The westward current velocity is about 1 knot and the eastward current about 1.5 knots, but a 3-knot current may be encountered at times. The currents are usually accompanied by tide rips off the points.

Sugarloaf Head, at the southern end of Semisopochnoi Island, is a rounding, low, irregular, rocky point forming the southerly base of a 2,870-foot snow-capped conical peak which has a prominent secondary conical crater 1,620 feet high on its southern slope. The small high just

east of the head has a section of sloping sand beach which is fronted by several lines of breakers. Two small bights with sloping boulder beaches are about 1 and 2 miles westward of the head.

The valley drains to the southeast coast of the island between **Sugarloaf Head** and a jagged ridge with twin pinnacles more than 3,000 feet high to the northeast. Eastward from the lake area, a low pass 600 to 800 feet high leads between steep cliffs to a broad grass-covered valley at the head of a small bight south of **Pochnoi Point**, the eastern end of the island. The point is broad, somewhat flat, and terminates in sheer rock cliffs about 300 feet high. A small stretch of sloping sand beach at the head of the bight is the best landing place on the island, but it is fronted by a small sand bar about 25 yards off-shore.

Petrel Point, the north end of the island, has a prominent waterfall on its northwestern tip that makes a sheer drop from the top of the bluff. Two small bights with sloping boulder beaches are about 2 and 4 miles along the shore southeast of Petrel Point.

Northwest of the lake area, the old crater wall rises steeply to a ridge with two prominent cones. **Tuman Point**, at the western end of the island, is faced with steep bluffs. A prominent triangular-shaped face of a 1,200-foot peak that drops steeply to the shore is 1.5 miles eastward along the north shore of the point. A sloping boulder beach is about 2 miles eastward of the point. In the broad but slight bight just south of Tuman Point are small stretches of sloping sand beach, but they must be approached through heavy kelp growing on large boulder rocks.

The best anchorage at Semisopochnoi Island is 1 mile offshore between Tuman Point and Petrel Point in 18 to 22 fathoms, sand and gravel bottom. This is inshore of the strength of the current, the approach is unrestricted, and it is well protected from most directions. Good anchorage is available in the center of the bight south of Pochnoi Point in 15 to 22 fathoms, sand bottom; it is free of tide rips and the current that prevails around the point. A fair anchorage is 1 mile offshore midway between Pochnoi Point and Petrel Point in 27 fathoms, sand bottom; current is about 1.5 knots. Another fair anchorage is 2 miles west of Sugarloaf Head in 25 to 30 fathoms, sand and gravel bottom.

Local magnetic disturbance.—Differences of as much as 4° from normal variation have been observed near Sugarloaf Head on Semisopochnoi Island.

Petrel Bank, extending about 30 miles northeastward from Semisopochnoi Island, is 16 to 20 miles wide within the 100 fathom curve. The high point on the ridge, covered 21 fathoms, is 15 miles northeast of the island. A narrow ridge extending 30 miles northeastward of Petrel Bank has ridges of 38 and 48 fathoms. The tidal current on Petrel Bank is rotary, turning clockwise. See Tidal Current Tables for additional information.

Chart 9102.—**Bowers Bank** extends northward and westward from Petrel Bank in a circular direction for

nearly 250 miles. The bank between the 1,000 fathom curves is 30 to 35 miles wide and contains several well-defined ridges; the least depth is 65 fathoms.

Chart 8864.—Amchitka Island, 27 miles southwest of Semisopochnoi Island, has a northwest-southeast length of 34 miles and a greatest width of 4.5 miles. The southeastern part is very low, the highest point being 351 feet. The northwest section is hilly and much higher, with peaks rising to 1,200 feet. The high land levels out toward the middle of the island to a low, rolling tundra and flat tableland. Many lakes and ponds are on the south half and a portion of the north half of the island. Most of the coast is fringed with reefs and extensive kelp beds. The shores are generally steep with many off-lying covered rocks, especially on the north shore and the eastern part of the south shore. Vessels should stay outside the 50-fathom curve, up to 4 miles off the north shore and 7 miles off the south shore, unless proceeding to anchorage. Weak tidal currents have been observed along the south side of the island.

Local magnetic disturbance.—Differences of as much as 8° from the normal variation have been observed on Amchitka Island.

South Bight, 3 miles west of East Cape, is an excellent anchorage on the south coast of Amchitka Island, offering shelter during northerly weather.

Chart 9123.—Constantine Harbor, on the north side of Amchitka Island 6 miles westward of East Cape, provides a fair anchorage. Because there are no prominent features on the island, caution is necessary to avoid mistaking other indentations for Constantine Harbor.

The southerly side of Constantine Harbor entrance is foul for 0.5 mile offshore. On the north side a reef, covered less than 2 fathoms in places and marked by heavy kelp, extends almost 1.5 miles eastward of Kirilof Point. The head of the harbor is a sand beach; other shores are rocky bluffs.

Currents in the entrance to Constantine Harbor are strong and set across the narrow entrance channel. North and northeast gales may force vessels anchored in the harbor out to sea. The harbor is reported free of williwaws. The 0.2-mile-wide channel between the reefs at the entrance can be made on course 233°; depths are 20 to 30 fathoms. Once inside anchorage is available in 6 to 20 fathoms, fair holding ground in sand and shell bottom. **Kirilof Wharf**, on the north side of the harbor, has nearly 900 feet of berthing space with 42 feet or more alongside. Vessels at the wharf are likely to surge when southerly swells are running in the Bering Sea. The wharf is untenable when a heavy swell is entering the harbor from the northeast. The piers at the head of the harbor are in ruins.

Chart 8864.—Kirilof Bay, on the north side of Amchitka Island 8.5 miles westward of East Cape, is suitable only for small boats. Breakers have been reported to run across the entire entrance to the bay.

Chukchi Cove, 24 miles northwestward of East Cape, affords good protection from southerly and westerly weather. The approach is clear except for a 3-fathom shoal 0.7 mile northwestward of Chitka Point. Anchor 0.7 mile offshore in 18 to 20 fathoms with good holding ground in sand bottom.

Good protection from southerly winds can be had 0.7 mile offshore 1.5 miles east of Bird Cape, the northwest end of the island. The anchorage is midway between a kelp patch off the east side of the cape and a rock awash off the first small point to the east of the cape in 20 to 23 fathoms, sand bottom. Enter on course 170°, heading for a prominent 50-foot-high pinnacle rock.

Protection from north and northeast winds can be had about 1 mile offshore 12 miles along the south coast of Amchitka Island from Aleut Point, the western end of the island. The anchorage is midway between two prominent rocks in 17 to 20 fathoms, sand bottom. Enter on a north course.

Oglala Pass, between Amchitka Island and Rat Island, is almost 10 miles wide; depths of 21 to over 30 fathoms can be carried through the middle of the pass. The current is somewhat rotary, turning clockwise. A 4-knot current has been measured in the middle of the pass; greater velocities may be experienced. Currents exceeding 7 knots have been encountered 1.5 miles northwest of Amchitka Island. See Tidal Current Tables for additional information. During moderately heavy southerly weather, heavy tide rips extend across the pass at maximum ebb and attain heights of 30 to 40 feet under storm conditions. The pass should not be attempted by small vessels during southerly weather when the current is ebbing strongly.

Little Sitkin Island, 32.5 miles west of Semisopochnoi Island, has a north-south length of 5.5 miles and an east-west width of the same distance. The interior is extremely rugged and mountainous; only the lower slopes are grass covered. There are two prominent peaks—one 3,897 feet high in the northeastern part, and the other 1,000 feet high in the southern part. Numerous streams are on the island but no lakes or ponds. The coast is generally hold, rocky, and precipitous, with a fringe of kelp 200 to 400 yards wide. A bank with a least depth of 10 fathoms extends about 1 mile off the north shore. No dangers are more than 600 yards from the beach. See Tidal Current Tables for predictions.

The sloping beach in the bight 1 mile eastward of Prokhoda Point, the south end of the island, is abrupt and composed of large, irregular boulders. Temporary anchorage, protected from west and northwest winds, can be had 0.5 mile offshore 1.5 miles northeast of Prokhoda Point in 22 to 25 fathoms, sand bottom.

A good anchorage in southwesterly weather is 600 yards offshore 2 miles northwest of Pratt Point, the east end of the island, in 20 fathoms, sandy bottom.

An anchorage protected from southerly swells is 0.7 to 1 mile offshore just eastward of Patterson Point, the north end of the island, in 20 to 25 fathoms, sand bottom. However, the williwaws off the island reach gale force with only a moderate southwest wind and currents setting around the island cause tide rips.

Anchorage in **Williwaw Cove**, just west of Patterson Point, is not recommended. The beach at the head is flat and sandy, but bordered by several lines of breakers.

The sloping beach at the head of **William Cove**, 2 miles westward of Patterson Point, is abrupt and composed of large, irregular boulders. Small steam jets and hot springs are in the valley at the head of the cove.

Small craft can anchor in the bight just north of **Sitkin Point**, the west end of the island, but strong williwaws are prevalent in easterly or northeasterly weather. A large prominent tan-colored bluff is at the head of the bight.

Anchorage protected from the northeast is 0.5 mile offshore in 25 to 30 fathoms, 0.7 mile southeast of a prominent 100-foot islet about 1 mile southward of Sitkin Point. The anchorage is fair in moderate northwesterly and easterly winds.

Little Sitkin Pass, between Little Sitkin Island and Davidof Island, is 3 miles wide with depths of 48 fathoms or more in the middle part. Moderately heavy tide rips occur in the pass during the strength of the tidal current.

Rat Island Pass, between Rat Island and the group of islands to the northward, is 8 miles wide and has depths of more than 50 fathoms through a 4-mile middle width. Currents in the pass are moderate; some set may be expected opposite Little Sitkin Pass and Khvostof Pass. See the Tidal Current Tables for predictions.

Chart 9180.—**Rat Island**, 12 miles northwest of Amchitka Island, is 8 miles long with a greatest width of 2 miles. The interior is rugged and mountainous, and the shores are rocky. Most of the north coast is precipitous and fringed with reefs; small islets and a reef extend 2 miles southeastward from **Ayugadak Point**, the east end of the island.

Gunners Cove, about midway along the north side of Rat Island, has depths of 1 to 12 fathoms, but is not suitable for anchorage. The bottom is smooth rock and the wind funnels through the cove. A prominent 50-foot cataract is at the head of the cove.

Protection for small vessels in westerly weather is available off the entrance to Gunners Cove in 17 fathoms. Rocks and reefs on both sides of the cove restrict the swinging room. Larger vessels can anchor farther off the cove in 28 fathoms, sand bottom. The anchorage on the southwestern coast of Little Sitkin Island offers protection from northeasterly weather.

Fair anchorage during southerly weather can be had 2 miles eastward of **Krysi Point**, the west end of Rat Island, in 28 fathoms. The slope between the 20- and 30-fathom curves is less abrupt at this anchorage than elsewhere along the north coast; however, the bottom is irregular inside the 20-fathom curve.

A good anchorage in northerly and easterly weather is 1.2 miles offshore midway along the south coast of Rat Island in 17 to 25 fathoms. The anchorage is 0.8 mile northwestward of the offshore group of rocky islets, 20 feet high, which are the dominant feature along this coast. Approach the anchorage from the southwest, passing 0.6 mile westward of the islets.

Davidof Island, 7.5 miles north of Rat Island, is irregular in shape with a north-south length of 2 miles and a greatest width of 0.7 mile. The high point in the southern part is 1,074 feet and the summit in the northern part is 922 feet high. The projecting easterly point of the island is marked by a prominent cone-shaped grayish-tan summit. An islet and a knife-edged pinnacle lie close off the north end of the island.

Khvostof Island, 1 mile northwestward of Davidof Island, is 1.5 miles long and 0.8 mile wide. The interior is rugged and mountainous; the highest peak of 870 feet is in the western part. Prominent twin rock pinnacles lie close off the north end of the island, and a low flat rock is 700 yards off the northwest shore. A 1½-fathom shoal is 0.4 mile off the north point of the island.

The passage between Davidof Island and Khvostof Island is partially blocked by small and rugged **Pyramid Island**. The openlugs on either side of Pyramid Island are narrow and foul, and have extremely heavy kelp. The blocked passage helps protect **Crater Bay**, northeast of Pyramid Island from southeast to southwest weather. Use of Crater Bay is restricted by a 2½-fathom shoal 0.6 mile north of Pyramid Island. The part of the bay between Pyramid Island and Davidof Island is clear but too deep for anchorage except close under the shore of Davidof Island, where small craft can find excellent protection. Small craft can also anchor, with limited swinging room, close under the northeast shore of Khvostof Island. Large vessels can anchor, free from tidal current, just inside the 30-fathom curve midway between the north end of Khvostof Island and the knife-edged pinnacle off the north end of Davidof Island.

Khvostof Pass, between Khvostof Island and Segula Island, is deep and clear and may be navigated without difficulty. The pass is subject to heavy tide rips at strength of spring currents, especially with moderate breezes from any direction.

Segula Island, 10 miles northwest of Rat Island and the most westerly of the group on the north side of Rat Island Pass, has a north-south length of 4 miles and an east-west width of 3.6 miles. The island is a lone crater-topped mountain, rising to 3,784 feet. A prominent deep fissure is on the south face of the mountain. Just west of the break is a broad, grassy slope that extends to the rocky bluff midway along the south shore.

Iron Point, on the southeast corner of the island, is a narrow, grass-covered, rock bluff 72 feet high; foul ground, marked by kelp and a breaker, extends 500 yards from the point. **Gula Point**, the northernmost tip of the island, is low, narrow, and grass covered. A distinctive dark, round-topped hill is at the end of the long ridge east of the small cove on the north side of the island, west of Gula Point. The cove entrance is nearly closed by reefs.

On the south side of **Zapad Head**, at the northwest corner of the island, a prominent grass-covered slope rises gradually from the gravel beach of a small bight; protected anchorage for small craft is afforded in the bight during moderate northeast to southwest weather.

A line of high, steep pinnacles extends westward from **Chugul Point**, at the southwest corner of the island. Between Zapad Head and Chugul Point irregular bottom, marked by heavy kelp, extends 800 yards offshore.

Segula Pass, between Segula Island and McArthur Reef, is wide, deep, and clear. Courses through the pass should be shaped to clear Segula Island by at least 1 mile and McArthur Reef by at least 2 miles.

McArthur Reef, 8 miles west of Segula Island and about the same distance east of Kiska Island, is a menace to navigation. The reef is about 0.8 mile in diameter, it does not uncover, and it does not break continuously even in a moderate swell at low water. The reef is not readily visible except close aboard, and then can be identified only by a small area of slick water surrounding kelp.

McArthur Pass, between McArthur Reef and Kiska Island, is deep and clear and can be navigated without difficulty.

Krysi Pass, between Rat Island and Sea Lion Rock, has a jagged ridge covered in some places with only 2 to 4 fathoms extending across it. See Tidal Current Tables for predictions. The pass is not recommended.

Sea Lion Rock, 9 miles west-northwest of Rat Island and 8 miles east-southeast of Tanadak Island, is less than 200 yards in extent and is about 10 feet high. A thick kelp bed around the rock extends 2 miles eastward and the same distance westward.

Sea Lion Pass, between Sea Lion Rock and Tanadak Island, has depths of more than 20 fathoms over a 2-mile width near the middle. Sea Lion Rock is an uncertain target except in calm weather. Tide rips dangerous to small vessels may occur in the pass during spring tides. Tidal currents of 4 knots have been observed. See the Tidal Current Tables for predictions.

Kiska Island is about 600 miles west of Unalaska Bay and is the most important of the Rat Islands because of its well-sheltered anchorage. It is about 22 miles long and varies in width from 1.5 to 6 miles. The island is very rugged and mountainous, the northern end being dominated by **Kiska Volcano**. The crater of the volcano has two tips, the westerly and slightly higher being 4,004 feet high. Immediately south of the volcano is a low valley about 2 miles wide in which are several salt water lakes. The valley extends nearly across the island from a long, low stretch of shoreline on the west coast, and a narrow draw leads over a low ridge at the head of the valley to a small steep-to sand beach on the east coast.

Flat-topped, boulder-strewn ridges rise to over 1,000 feet between the lake area and Kiska Harbor. A low, narrow pass cuts across the island from the southwest corner of Kiska Harbor to a small, foul bight on the west coast. South of this pass, sharp, rugged ridges 1,500 to 1,700 feet high extend to the southwest corner of the island. These ridges are precipitous on their western sides, but slope gradually on their eastern sides to the shore of Vega Bay. The valleys and lower slopes of the island are covered with tundra and grass, while the higher parts are generally bare and strewn with boulders, especially the ones north of Kiska Harbor.

The shores of Kiska Island are mostly rocky and steep, and are bordered in many places by covered and uncovered rocks. Kelp fringes most of the island. Kiska Harbor and Vega Bay are the two principal indentations of the coast.

Caution.—Kiska Island is a Naval Defensive Sea Area, and is closed to the public. No vessels except those authorized by the Secretary of the Navy shall be navigated in the area within the 3-mile limit.

Sirius Point is a jutting rock ledge at the northern tip of Kiska Island, and the coast for more than 2 miles in either direction is formed of irregular, steep, rock cliffs and minor points. Deep water extends to within 0.5 mile of the shore. The sharp rocky point at the northeast corner of the island is topped by a grass-covered hill conspicuous from the northwest and southeast.

In March 1962, a volcanic outgrowth was observed making out from shore for a distance of 0.3 mile on the west side of Sirius Point.

Pillar Rock, 118 feet high, is a perpendicular rock of remarkable form 9 miles westward of Sirius Point and 6.6 miles from the nearest part of the island. **Sturdevant Rock**, covered about 7 fathoms, is 3 miles 282° from Pillar Rock.

Northeast Rocks, with a high point of 115 feet, and **Haycock Rock**, a lone 113-foot pinnacle 1 mile to the southward, are 0.4 mile off the coast eastward of the volcano. These rocks mark the outer limits of an extensive foul area and are excellent landmarks for visual or radar navigation. Behind Northeast Rocks is a prominent red bluff which is frequently visible when the other parts of the island are obscured by low clouds or fog.

Between Haycock Rock and Sredni Point, 2.5 miles to the southwestward, is **Sredni Bight**, an open bight that affords good shelter from northwesterly weather in 15 to 20 fathoms, sandy bottom, 0.7 to 0.9 mile from the beach. The anchorage may be entered on a course of 285°, heading for the end of the bluff that marks the south side of the small, sandy beach at the head of the bight. Moderate williwaws may be expected, and swells enter the anchorage after a storm in the Bering Sea.

Sredni Point is sharp, sheer, and high. Southwestward from the point to Reynard Cove and Salmon Lagoon, the high cliffs are bordered by detached pinnacles, rocks awash, and sunken rocks. This section of coast should not be approached closer than 1 mile.

Reynard Cove, 2 miles southwest of Sredni Point, is blocked by a reef that extends nearly the entire width just inside the entrance.

Salmon Lagoon, 2 miles southwest of Reynard Cove and the same distance north of Kiska Harbor, can be entered with a pulling boat at high water, but the channel through the low, sand, outer beach is sometimes closed and often shifts position.

Kiska Harbor and Little Kiska Island are discussed later in connection with chart 9124.

In general, the waters adjacent to the Pacific side of Kiska Island, from Little Kiska Island to Cape St. Stephen, are irregular in depth. Broken bottom, within the 30-fathom curve, extends 1.5 to 2 miles offshore. Sub-

merged pinnacles rise in deep water in Vega Bay, off Sobaka Rock, and off Cape St. Stephen. The several small bays and coves between South Pass and Vega Bay are unsuitable for anchorage.

Vega Bay is a broad indentation between **Bukhti Point** and **Vega Point**. The western part of the bay has irregular bottom, with a $2\frac{1}{4}$ -fathom shoal 1 mile 070° from Vega Point. The rest of the bay is clear except for inshore rocks. In northerly or westerly weather, good anchorage can be found in 22 to 30 fathoms, sand bottom, off the entrance to **Gertrude Cove** in the northeast corner of the bay. A pair of gray pinnacles on the shore west of the cove bears 000° from the anchorage. The cove is a good anchorage for small vessels in all except southwesterly weather.

Sobaka Rock is 1.4 miles 155° from Vega Point. About 2.4 miles due west of the rock is a $2\frac{1}{2}$ -fathom shoal. Because of possible set by currents, particular care is necessary to avoid this shoal in rounding the south end of Kiska Island. Heavy tide rips occur in this area.

Dark Cove, small and shallow, is on the southwest side of Kiska Island just eastward of Cape St. Stephen. When the weather is rough outside, small boats have been able to land safely in the northeast corner of the cove. Landing is impracticable with a swell from the south-southwest.

Cape St. Stephen, the southwesternmost point of Kiska Island, should be passed no closer than 3.5 miles to avoid broken ground in the area of the 8-fathom shoal 1.8 miles 230° from the southern tip of the cape. Heavy tide rips occur in this area at strength of current.

From Cape St. Stephen, the shoreline, extending about 15 miles in a northeasterly direction to Witchcraft Point, is in general steep and rocky, and is indented by several small bights. Deep water extends to within 0.5 to 0.8 mile of the shore for the first 12 miles. Several pinnacle rocks and rocks awash fringe this part of the coast.

A prominent line of high rock pinnacles extends 700 yards offshore from **Witchcraft Point** on the northwest side of Kiska Island. Southward of Witchcraft Point low grass-topped bluffs, interrupted by the valleys of two stream beds, extend 2.7 miles to **Conquer Point**, a sharp and sheer rocky point at the foot of a razorbacked hill about 965 feet high. A $2\frac{3}{4}$ -fathom shoal is about 0.5 mile west-northwestward, and two reefs with depths of 4 and 6 fathoms are about 1 mile off the latter point.

Temporary anchorage for small boats can be had in the small bight on the south side of the razorback, having due regard for charted dangers. The bight has a sand beach.

Anchorage, protected from moderate northeast to southeast breezes and swells, can be found in 25 fathoms, sand bottom, 0.8 mile off the coast 1.1 miles south of Witchcraft Point. The anchorage should be approached on a course of 110° , heading for the small valley about midway between Witchcraft Point and the razorback to the southward. In this anchorage Witchcraft Point is on range with Vulcan Point.

A low sand and gravel beach, with a prominent grass-topped knoll about midway of its length, extends 2.5 miles northeastward from Witchcraft Point. Then begins a

rock cliff coast that extends 1 mile northward to **Vulcan Point**. Northeastward from Vulcan Point to Sirius Point, a distance of 3 miles, the coast is rocky and steep with deep water close to shore.

A reef, covered 5 fathoms, extends northwestward from Witchcraft Point for 2 miles toward Pillar Rock, then eastward to a point inshore about 2 miles south of Vulcan Point. Heavy kelp marks the reef in the summer, and extremely large tide rips occur in the area at strength of current, especially during spring tides. It is not advisable to approach the reef closer than the 30-fathom curve. Small craft passing between the reef and Pillar Rock should do so when the currents are near slack, which periods occur approximately at the same time as in Krysi Pass.

Chart 9124.—Kiska Harbor, midway along the east shore of Kiska Island, is formed by a small peninsula to the northward which terminates at **North Head**, and a broad peninsula to the southward which is separated from Little Kiska Island by South Pass; **South Head** is the northeast point of the lower peninsula. The harbor proper is roughly circular with a 1.3-mile diameter, although anchoring depths extend an additional 0.5 mile eastward. The northeastern and southern sides are rocky cliffs; the entire western side of the harbor is low and sandy except for several ridges which extend to the water's edge. A low valley opening out at about the middle of the west shore extends well back into Kiska Island. A low ridge parallels the north shore at a distance of about 0.5 mile.

Depths do not exceed 17 fathoms inside a line between North and South Heads. The 10-fathom curve is 0.3 to 0.5 mile off the shores. Caution is necessary in anchoring to avoid fouling with the many wrecks and other obstructions in the harbor. The masts of one derelict show above water in 15 fathoms near the center of the harbor, and a $2\frac{3}{4}$ -fathom obstruction is just inside the 10-fathom curve off the western shore.

Anchorage is recommended in the central part of the harbor in 13 fathoms 0.7 mile 185° from North Head. Shelter from northeast to northwest weather can be found in 15 fathoms 700 yards 150° from the outer end of the main wharf. The bottom is hard sand with fair holding qualities.

The diurnal range of tide is 3.6 feet in Kiska Harbor. See the Tide Tables for daily predictions.

The shortest route to Kiska Harbor from Seattle with the best visibility is via Unimak Pass and the Bering Sea. From San Francisco the shortest distance is via Chugul Pass and Asuksak Pass, 20 miles east of Adak Island, thence north of the Aleutian Islands to Kiska Harbor; however, a direct route through Amchitka Pass and Rat Island Pass is only a few miles farther. Oglala Pass can also be used for the approach from the south. Offshore dangers in the approach to Kiska Harbor are McArthur Reef and the 4-fathom rock 1.3 miles northward of Tanadak Island.

A ship wharf and a small-craft wharf are on the north side of Kiska Harbor. The ship wharf extends 500 yards

out from the shore in a southeasterly direction and can berth a large vessel on either side of the outer end. Depths along this part of the wharf decrease from 36 feet at the offshore end to 28 feet at a point 400 feet inshore. As depths shoal gradually, smaller craft may 5 berth inshore of the ship's berth.

The small-craft wharf eastward of the ship wharf is 450 feet long and will berth medium-sized craft up to 12 feet in draft. Depths of 15 feet are at the outer end and 12 feet about 100 feet inshore.

Little Kiska Island, 0.5 mile eastward of South Head on Kiska Island, is 3.2 miles long and 1 mile wide. The island is low and rocky, the highest point being 430 feet. The shores are, in general, rocky and often precipitous, although there is a small stretch of low beach facing on South Pass. The coasts in most places are fringed by covered and uncovered rocks; a group of islets or rocks extend about 700 yards from the western end of the island.

Anchorage with fair protection from the north can be found in 20 fathoms, irregular rocky bottom, south of the center of Little Kiska Island. The highest peak, with two knobs at the summit, should bear due north.

South Pass, between Kiska and Little Kiska Islands, is a narrow approach to Kiska Harbor from the southeast. **Twin Rocks** are a group of small islets on the west side of the south entrance. A 2-fathom rock that breaks in rough weather, 1.2 miles northeastward of Twin Rocks, is a danger to vessels approaching the pass from the south.

A 100-yard wide channel with a swept depth of 24 feet is between a pinnacle covered 11 feet 230 yards northeast of South Head and the near shore. East of this narrow channel, kelp patches show across South Pass to Little Kiska Island during slack water. Only light-draft vessels with local knowledge should use South Pass.

The current velocity is 4 knots in South Pass, the flood setting northward and the ebb southward. The ebb current is particularly strong south of the pass.

Tanadak Island, 2.7 miles eastward of Little Kiska Island and 8 miles westward of Sea Lion Rock, is a small grass-covered plateau; cliffs rise from the water's edge or close behind it. Foul ground extends for more than 0.5 mile from the shores; irregular depths of less than 10 fathoms extend 4 miles southeastward of the island.

Tanadak Pass, between Tanadak and Little Kiska Islands, is 2.5 miles wide but is full of shoals with depths of 2 to 9 fathoms. A 225-yard-wide channel with a least depth of 12 fathoms is 0.6 mile west of a prominent 20-foot rock, the most westerly of those off Tanadak Island. Kelp shows in the pass at slack water during the summer. A current velocity of 2.8 knots has been measured in the pass. Tanadak Pass is not recommended for deep-draft vessels.

Chart 8864.—Buldir Island is an isolated island between Kiska Island and the Semichi Islands. This island forms an excellent landmark for the western Aleutians. The island is about 4 miles long and 2 miles wide, rugged and mountainous. The highest summit, 2,150 feet, is on the southern part of the island. Two lesser summits, 2,013 and 60

1,768 feet, are on the northeastern end. High, steep land-slides are along the eastern end and on the southwest side. The shores, in general, consist of cliffs either rising from the water's edge or backing, narrow rock and sand beaches. The island is a bird refuge.

A chain of bold rocks and conspicuous islets extends 1.2 miles northwestward from Buldir Island. The outermost of the three islets is 442 feet high, dome shaped, and an excellent landmark. It can often be seen by vessels passing to the northward when Buldir Island is obscured by fog or thick weather. Tide rips are generally in evidence along the submerged ridge extending 1.8 miles northwestward from the islet, but no dangerous shoals or reefs are on the ridge.

At the east end of the island are several groups of rocks, the farthest being about 0.3 mile offshore. The south coast is foul alongshore and should be approached with caution. Other shores are less rocky. Heavy kelp nearly encircles the island and probably marks all inshore dangers. Vessels passing Buldir Island on any course should stay outside the 50-fathom curve.

The anchorage on the northwest side of Buldir Island is the shallow bight formed by the island and the chain of rocks and small islets extending to the northwest. With the exception of the narrow valley opposite the anchorage, the slopes rise precipitously from the shoreline to the peaks. The sandy beach at the mouth of the valley affords the best landing on the island and a small stream empties into the bight at this point. Good anchorage, free from strong currents, can be found in 15 fathoms, sand bottom, with the middle of the beach bearing 170°. The anchorage affords adequate protection in fresh southeasterly to southwesterly weather but not in severe storms from any direction. Anchorage suitable for moderate easterly weather can be found in 15 to 20 fathoms 1 mile from shore just south of the chain of rocks and islets.

Extending southeastward from Buldir Island to Kiska Island is a submerged ridge which is marked by heavy tide rips. **Buldir Reef**, 18 miles along the ridge from Buldir Island, is about 5 miles long and 0.5 mile wide. The dangerous part of the reef includes two areas where breakers can be observed. The easterly area is estimated to have depths of 2 to 3 fathoms over it. The westerly area, covered 3 fathoms, is of considerable extent and marked by heavy kelp beds.

Currents up to 5 knots were encountered in the area of shoals between Kiska and Buldir Islands. The set was to the north or northeast on the flood. Northwest of Buldir Island the set was always northward. Currents are believed to be moderate except near shoals or islands.

Middle Reef, a rocky shoal covered 3 fathoms, is 22 miles south of Buldir Island; it is not marked by kelp. Thin kelp extends for 1 mile south of the reef and from the appearance of the area on the swell, depths of less than 3 fathoms probably exist.

Tahoma Reef, upon which the cutter TAIOMA was lost in 1914, is 33 miles southward of Buldir Island. The main reef, which has an east-west length of 1.3 miles, breaks at the east end in a light swell, and for its entire length in a moderate swell. Kelp beds extend 1 to 3 miles

from all sides of the reef. A current velocity of 1.5 knots was observed in the vicinity of the reef; see the Tidal Current Tables for predictions.

Chart 9198.—The Near Islands include the Semichi Islands and Attu and Agattu Islands.

The **Semichi Islands** are Shemya, Nizki and Alaid. Shemya Island, the easternmost of the group, is about 65 miles west-northwest from Buldir Island. Alaid Island, the westernmost, is about 16 miles east by south from Attu. The group trends west-northwest over a distance of 11.5 miles. The islands have numerous lakes, are covered with tundra, and are treeless. The shores are fringed with reefs and rocks, some as far as 1 mile offshore.

Currents estimated to exceed 1 knot occur east and west of the Semichi Islands and in the passes between them. Southward currents have been reported in the area between the Semichi Islands and Agattu.

Ingenstrom Rocks, 14 miles southeastward from the east end of Shemya Island, are a group of four visible rocks and several others that uncover. The highest and northernmost of the group is 9 feet high. The rocks are in an area about 350 yards in diameter.

Depths of 3 to 9 fathoms extend 2.2 miles southeastward from the 9-foot rock. This reef probably breaks along its entire length during heavy weather. Vessels should not approach the rocks closer than 3 miles on the southeastward, and 2 miles on the north and west.

Chart 9125.—**Shemya Island**, 3.8 miles long and 1.8 miles wide, slopes gradually from the shoreline on the south to a round bluff 250 feet high along the north shore. An aero light is shown from the south slope of the island in about the middle, and an aero radiobeacon is at the west end.

The shoreline of Shemya Island is generally fringed with reefs except for a few short stretches of sand beach. Rocks, kelp, and shoals extend 0.6 mile northward of the north point of Shemya. The outermost offshore danger is a 4¼-fathom shoal, 0.6 mile off the north shore.

Several prominent rocky islets, highest 56 feet, are 0.7 mile off the northeast coast of Shemya Island. About 0.3 mile northwest of these islets is a rock covered 3 feet, which breaks much of the time. Foul area extends offshore to within 0.2 mile of the rocky islets. Between the outer end of the foul area and the islets is a channel which may be used by launches.

The waters for 1.2 miles east and south of the eastern point of Shemya Island are foul with visible and covered rocks; the area is marked by kelp. Shoals with depths of 9 fathoms or less and marked by kelp in the summer are 4 miles south and south-southeast of the point.

Alcan Harbor, on the northwest side of Shemya Island, is somewhat protected on the east, south, and west, but is wide open to northerly weather. The original breakwaters and piers have been largely washed away and, although partially rebuilt, deteriorate further with each severe winter storm. In October 1962, the breakwaters were reported undergoing repairs. Depths in the harbor

cannot be relied upon, because of the frequent changes, and vessels should be extremely careful of the natural and structural hazards. The diurnal range of tide is 3.4 feet in Alcan Harbor.

See Appendix for Shemya climatological table.

The south side of Shemya Island is mostly fringed with reefs and rocks which extend as much as a mile off, but there are short stretches of sandy beach. **Skoot Cove**, 0.7 mile from the west end of the island, has depths of about 2 fathoms, and small boats may find it possible to come alongside the piers when weather conditions prevent landings in Alcan Harbor.

Hammerhead Island, 55 feet high and 0.5 mile west of Shemya Island, is the southernmost of several small islands surrounded by foul ground near the middle of **Shemya Pass**, which is between Shemya Island and Nizki Island. The controlling depth through the passages on either side of Hammerhead Island is about 13 feet, but the eastern passage is the preferable of the two. During stormy weather or when swells are running high in the Bering Sea or the Pacific, heavy breakers are likely to be encountered in the passages.

Chart 9130.—**Nizki Island**, between Alaid and Shemya Islands, is 3 miles long and 1 mile wide, and is nearly connected to Alaid by a shifting sandspit. The island with a high point of 165 feet is lower than either Alaid or Shemya. The shoreline is very irregular and is fringed by numerous rocks, reefs, and kelp-marked shoals. Narrow channels between the reefs lead to small coves which provide shelter for small boats.

During northwest to northeast weather there is good protection in an anchorage 1 to 2 miles south of the narrow passage separating Nizki and Alaid Islands in 10 to 20 fathoms, hard bottom.

Alaid Island is 3 miles long and about 1 mile wide. The eastern part is low rolling tundra; the western part is made up of four hills, two of which are over 600 feet high. Most of the shoreline is rocky and fringed with reefs, but there are several stretches of sand beach. The island has several bights which might provide anchorage for small boats in an emergency.

A dangerous 1-fathom shoal is 0.9 mile west of the west end of Alaid Island. Seas pile up on this shoal and much of the time it is marked by a breaker. Currents are strong in the vicinity and cause rips when the wind and sea are opposed. The deep channel between this shoal and the shore reefs may be used by launches under favorable conditions but is not recommended for large vessels.

Chart 9198.—**Attu Island**, the westernmost of the Aleutians, is 15 by 35 miles in extent and is indented by many bays and long inlets. The terrain is rugged and has practically no large level area. The bays on Attu Island offer a striking similarity. They are apparently formed by submerged valleys between mountain ridges. The heads of the bays are fed by streams which have carried down enough sand to give a good holding ground. The exception to this is Holtz Bay, which is rock and sand.

At the head of each bay is a crescent-shaped, sand beach with a more or less high bank of sand across the middle. A course down the middle of the bay, with the exception of Massacre Bay, was found to be clear; all that have been investigated show deep water close inshore. Some have rocks along the shore but these are easily seen. Anchorages are in from 10 to 15 fathoms, sand bottom. The best method is to head into the bay until these depths are reached and anchor. At the heads of most of the bays are barabaras (huts) built by the Aleuts for use during the fur-trapping season.

Currents.—Strong currents may be encountered along the north coast of Attu Island, and while variable, the consensus seems to be that they follow strong winds and are noticeably affected by the weather. In calm weather the set is generally southeastward.

Survey operations in recent years have roughly defined tidal currents crossing the chain here, setting in a general northwest and southeast direction at the flood and ebb respectively, except as diverted by shoal and land areas. Slack follows the times of local high and low water except for a lag at times as great as 1 hour.

Chart 9128.—**Chirikof Point** is the end of the long peninsula jutting eastward from Attu Island. This peninsula forms the north side of Massacre Bay and its approaches and the south side of Sarana Bay. It is mountainous and has several deep valleys running approximately north and south across it. Its shores are rock or boulders; it has rocky bluffs on the north shore and, like most of the land areas in the Aleutians, gentler slopes and lower bluffs along the south shore. **Alexai Point**, midway along the south side of the peninsula, is flat and low with sand beaches in the east and west bights. Foul areas surround this point for 1 mile. The channel to Massacre Bay passes 0.8 mile southwestward of this point.

As a rule the peaks on Attu Island are clouded in and are of little use to the navigator in making a landfall. Peaks on the peninsula are no exception to this rule. The lower hills and summits on Chirikof Point are frequently clear when the peaks are cloud covered and consequently a landfall here is not as difficult. The end of the point is paralleled by a ridge of varying elevation, more or less crescent shaped, extending from the southeast to the northeast extremities of the point. The highest part of this ridge is a peak 1,315 feet high, approximately at the center of the point (north and south). The ridge terminates at its northeast end in **Buchanan Point**, a prominent knob and headland 320 feet high. To the south and southwest of the summit, the ridge slopes down to a prominent knob-topped hill and then drops still lower to a flat area carrying out eastward to the end of **McCloud Head**. A prominent black islet, 10 feet high, is about 0.5 mile north-northeast of Buchanan Point. Low rock ledges, mostly bare at high water, make out in an easterly direction from the south part of the point. A fair anchorage in 15 to 25 fathoms, sand bottom, can be had in the bight between the two extremities of the point with good protection in southwest to northwest weather.

A 3-foot-high rocky islet is 2.4 miles east-southeast from

McCloud Head. East, south, and southwest of this islet for 0.8 mile are shoal areas of 7 to 10 fathoms. No dangers were found except close in to the islet, but the area should be avoided and the rocky islet approached no closer than 1 mile as the bottom is ragged and currents are strong. A safe channel exists west of this islet and 1 mile east of **McCloud Head**.

Reefs and kelp patches extend off the shoreline between **Alexai Point** and **McCloud Head** to a distance of 0.5 mile. Anchorage can be had under this shore inside the 20-fathom curve, having due regard for the charted foul areas. The bottom is hard, however. A prominent waterfall on this shore is about mid-distance between the two points.

Massacre Bay, on the south side of Attu Island 6 miles west of Chirikof Point, is 4 miles wide between **Alexai Point** on the east and **Murder Point** on the west, and recedes for about 3.5 miles in a northerly direction. Numerous shoal areas obstruct the bay but wire-dragged channels lead to the harbors.

The approach to Massacre Bay through **West Channel** is marked by buoys. A tower 625 feet high is on **Barbara Point**, about a mile south of Pyramid Cove.

Anchorage in Massacre Bay can be had in 10 to 20 fathoms; the bottom is volcanic ash and sand with some clay. The bay is protected on the north, east, and west by Attu Island, and in southerly weather heavy swells are broken up by off-lying reefs.

The diurnal range of tide is 3.3 feet in Massacre Bay; see the Tide Tables for daily predictions.

In 1902, the Army piers at the head of Massacre Bay were in poor condition and reported condemned. The Navy piers in **Pyramid Cove** were in somewhat better condition, but were not being maintained. Vehicular traffic was permitted only on Navy Pier 2. Numerous obstructions were reported to exist in Pyramid Cove and in the rest of the bay. Shallow-draft craft can tie up to dolphins behind the breakwater in the southwestern part of **Casco Cove**, which is midway between Pyramid Cove and **Murder Point**, 2.3 miles to the southward.

A U.S. Coast Guard Loran A and Loran C transmitting station is maintained at Pyramid Cove. An airline service calls twice weekly at the landing strip near Massacre Bay.

Chart 9127.—**Sarana Bay** is 5 miles west of Chirikof Point and on the opposite side of the peninsula from Massacre Bay. From Buchanan Point to the head of Sarana Bay the shoreline is rocky and precipitous with few valleys of appreciable depth. Mountainous terrain carries abruptly to the water with few off-lying rocks or ledges except at the small points. The south side of the bay and approaches consist of rock bluffs with close inshore rocks and pinnacles. **Square Point**, 3.5 miles west of Buchanan Point, is difficult to identify as none of the numerous points in this locality are prominent; however, the waterfalls on either side of Square Point are fairly prominent.

The head of Sarana Bay and also **Hodikof Bay** are low sand beaches. At **Hodikof Point** rocky bluffs begin again and continue to **Holtz Bay**. A chain of rocks and reefs, including **Hodikof Island**, makes out about 1.2 miles east-

ward from the small point at the north side of the inner bay. North of this chain of reefs is **Hodikof Bay**. A small-boat passage is west of Hodikof Island between Sarana Bay and Hodikof Bay. A low single-pinnacle rock, 4 feet high, is off the approaches to Hodikof Bay about 0.5 mile southeast of Hodikof Point. About 0.7 mile east-northeastward of Hodikof Point is an extensive area of irregular bottom with a least depth of $1\frac{1}{2}$ fathoms, which breaks in a heavy swell.

Sarana Bay is not recommended as an anchorage except for medium and small craft, as a cable area extends through the middle of the bay and in the position of the only ship anchorage. Smaller craft may anchor north or south of this area depending upon weather conditions, or in Hodikof Bay. Also an emergency anchorage may be had along the shore westward of Chirikof Point in not less than 15 fathoms but the bottom is hard and irregular and is subject to considerable current. Hodikof Bay seems to be the best anchorage for medium and small craft in this locality but it should be entered with suitable visibility. Approach on a west course, passing 400 yards south of the 4-foot rock off Hodikof Point. Anchor in the middle of Hodikof Bay in 10 to 12 fathoms, sand bottom. This anchorage is exposed to weather from the north around to the southeast. Southeast to southwest winds blow with considerable force in Sarana Bay, probably augmented in funneling through the passes across the peninsula. Their effect in Hodikof Bay is not known.

Kelliher Cove is a small bight 0.5 mile south of **Khlebnikof Point**. Small craft may obtain shelter from weather from south to northwest. The shores are rocky except at the head of the cove which has a short gravel beach. The bottom is hard.

From inner Sarana Bay to Holtz Bay the coast is rocky but with gentle slopes back to the mountains in the interior. East of and close inshore from Khlebnikof Point are off-lying rocky islets, 5 to 15 feet high, which serve as landmarks when cruising close inshore. **Middle Peak**, 2,000 feet high, is the highest point between Sarana Bay and Holtz Bay, but is usually covered by clouds.

Gibson Island, on the north side of the entrance to Chichagof Harbor, is a flat-topped grass-covered island 104 feet high. The smaller islets at the southeast limits of this group are bare pinnacles. **Cooper Islands**, 1 mile west of Gibson Island, may be identified by the sheer pinnacle, 125 feet high, constituting the southern half of the middle island.

Kennon Island, a 92-foot grass-covered island about 0.3 mile long, is at the northwest side of the mouth of Chichagof Harbor. A narrow and shoal channel into the harbor lies west of this island. **Middle and Inner Rocks** are low bare rocks 10 to 20 feet high. Middle Rocks are adjacent to and east of Kennon Island; Inner Rocks are adjacent to and south of the island. The main channel is southeast of these rocks.

Pisa Point, on the south side of the harbor entrance, is a low point ending in a reef. **Pisa Tower** is a prominent leaning pinnacle 44 feet high on the point. A rock that uncovers is 140 yards north of the point.

Chichagof Point, between Chichagof Harbor and Holtz Bay, is reasonably flat and 300 feet high. The shores are rocky bluffs.

Chichagof Harbor is small in area, shoal, and holding bottom is poor, but it is well sheltered, although south-east to southwest winds appear to funnel through the valleys into the bay with augmented velocity. There is little or no current effect. The bay is about 0.7 mile wide and allows little swinging room except for small craft. About 18 feet at low water can be carried into the head of the harbor where depths are about 6 fathoms. Turns are sharp for medium craft. Fifteen feet is recommended as the maximum draft of vessels entering this harbor because of the concrete anchor clumps which stand 3 to 4 feet above the bottom. The bottom is mostly hard or gravel.

The head of Chichagof Harbor is a sand beach divided into two parts by a rocky point. Other shores of the bay are ledge or boulders. The northern part of the bay, southwest of Kennon Island, is shoal and is recommended for small craft only. In the central part of the bay is a relatively large area of depths from 15 to 18 feet, with scattered kelp. The channel lies north and west of this area. The village of Attu, once located at the head of the bay, has been razed. There is a dock, suitable for small craft, on the southwest side of the bay. Depths at the dock shoal from 10 feet at the outer end to 4 feet 50 yards inshore. A road leads across the island to Masacre Bay.

Range Point is 400 yards southwestward of Inner Rocks. A $2\frac{1}{2}$ -fathom spot is 200 yards north of Range Point.

The diurnal range of tide is 3.6 feet in Chichagof Harbor.

Holtz Bay, the first bay west of Chichagof Harbor, is the largest and most spectacular on the north coast of Attu Island. It is a broad-mouthed bay thrusting deeply into the island and having bluff-bordered beaches backed by tundra-covered mountain masses on both sides.

The head of the bay is divided into two arms, separated by **Center Point**, a promontory about 500 feet high and having moderate, tundra-covered slopes. At the head of each arm is a broad sandy beach with low valleys beyond cutting back into the interior.

Holtz Bay is free from dangers except for inshore reefs. It may be entered on any course provided the shoreline is given a berth of at least 0.5 mile until the inner arms are reached. When 0.5 mile from Center Point and about abreast of a rocky islet off the western shore, take up a midchannel course down either arm. Anchor in 5 to 6 fathoms in West Arm and in 6 to 7 fathoms in East Arm. Vessels also anchor at the entrance to West Arm in 10 fathoms. The bottom in most of Holtz Bay is a fine gray sand, with shells and some boulders. The holding properties are fair.

Holtz Bay offers protection from southerly and westerly weather, but strong winds may draw up through the passes, especially in the fall and winter. One vessel reports having had an excellent lee from strong westerly

winds when anchored in 17 fathoms in the central part of the bay about 0.6 mile off Center Point. The bay is wide open to storms from the north and east.

Chart 9198.—West of Holtz Bay the north coast of Attu Island is precipitous, rugged and fairly straight for 7 miles. A number of reefs and rocks, all less than 0.3 mile from shore, lie off this coast. Except for these inshore rocks this stretch of coast is free from dangers.

Austin Cove is an open bight about midway in this 7-mile stretch of coast. It offers some protection from southerly weather to small boats anchoring close inshore. A ledge terminating in a rock awash at high tide makes off the west side of the cove. A rock ledge, which projects from the inner part of the cove for 0.3 mile, must be avoided.

Steller Cove is a wide bight in the coast about 10 miles west of Holtz Bay. Three open coves further indent the coastline of this bight. The shoreline is bluff-lined except for the stretches of sandy beach in the middle and western coves. The only dangers to navigation are the close inshore rocks.

Local magnetic disturbance.—Differences of as much as 4° from the normal variation have been observed in Steller Cove.

The westernmost of these coves offers the best anchorage. Some protection from southerly and westerly weather may be obtained here. To enter the anchorage, steer 210°, heading about 200 yards west of a prominent grassy knoll at the head of the cove. Anchor in 8 or 9 fathoms, with a fine gray sand bottom. The holding properties of this anchorage are fair. The anchorage offers no protection, however, from northerly weather. A current setting easterly along the shore may cause a vessel to lay in the trough of the sea and roll excessively.

Red Head, on the west side of Steller Cove, has a bluff-lined shore with a tableland sloping inland to mountains 1,880 feet high. The upper slopes of these mountains show bare and red and form a distinctive landmark in this region. A shoal area extends north from Red Head and marked currents swirl around this point. Red Head should be passed at least 1 mile off.

The only dangers from Steller Cove to the west end of Attu Island are the inshore reefs. Vessels can follow the coast with safety 1 mile or more offshore.

For several miles west of Red Head a low flat strip of land about 0.5 mile wide lies between the shoreline and the mountains. Several conspicuous boulders are scattered over this flat. The most conspicuous, a block of rock about 20 feet high in 53°00.8' N., 172°46.4' E., forms an excellent landmark.

Earle Cove, 7 miles west of Steller Cove, is at the west end of the belt of flat land. At the entrance to this small cove are several rocks but anchorage for small boats may be had in 10 fathoms 0.2 mile southwest of the larger rock in the cove entrance. Another anchorage in 11 fathoms may be had 0.2 mile south of this same rock. Care should be taken in approaching the anchorage to avoid the kelp and foul ground off the eastern point of the cove.

The shoreline for several miles west of Earle Cove is

craggy and precipitous, rising rapidly to peaks over 2,000 feet high. **Kresta Point**, 8 miles northeast of Cape Wrangell, is a prominent bold headland and marks the west end of this section of rugged coastline.

West of Kresta Point two small valleys make down to the coast, ending in a stretch of easy-sloping shoreline about 1 mile long. West of these valleys is another region of high mountains and craggy, precipitous shoreline, with a bold headland at its western end. This headland is 5 miles east of Cape Wrangell.

Two small coves lie southwest of this headland. Westward, between the coves and Cape Wrangell, the shore is bold and precipitous, with a few islets, rocks and reefs near the shore.

The current sets east on the flood and west on the ebb along the north coast of Attu Island near Cape Wrangell. Velocities of 1.5 knots have been observed and may reach 3 knots during spring tides. A current velocity of about 1 knot, 5 miles northeast of Cape Wrangell, sets east-northeastward on the flood and south-southwestward on the ebb.

Chart 9149.—Cape Wrangell is the westernmost extremity of Attu Island. The cape appears as a string of rocky, rugged islets, about 150 feet high, reaching out from a mountainous ridge. This ridge is bold and steep with a summit about 1,800 feet high.

On **Peaked Island**, just off the cape, a natural bridge and buttress forms an opening which has the deceptive appearance of a large patch of snow against the dark rocks. This is a distinctive landmark to vessels north and south of the cape.

A rock that uncovers 3 feet is about 0.3 mile west of Peaked Island. Breakers usually mark the location of this rock.

Cape Wrangell should be rounded at 1.5 miles distance. At maximum current the heavy tide rips extend for about 3 miles off the cape.

Southeast of Cape Wrangell, inshore currents were observed setting east at times.

Between Cape Wrangell and Etienne Head, the mountainous coastline is indented by two coves. A shingle beach lies at the north end of **Wrangell Cove**, the easterly of the two. Small boats have made landings on this beach.

Etienne Head is a moderate-sized headland about 120 feet high. A group of large black rocks and reefs lie off the headland.

Etienne Bay is the first large bay east of Cape Wrangell. It is broad and open, and has high mountains on both sides and a long sandy beach at its head. A low valley and a pass run inland from this beach.

The bay is clear of dangers to navigation except for the reefs and kelp patches which border the eastern and western shores. The western shore should be given a berth of at least 0.5 mile. The bottom shoals gradually as the bay is entered. Deep-draft vessels can anchor in 14 fathoms in midbay about 1 mile from the head. The bottom is fine green sand and pebbles and has fair holding properties.

A perpendicular-sided table-topped shelf about 500 feet high is located on the east shore 1.5 miles from the head of the bay. This makes a good landmark in Etienne Bay.

Etienne Bay is wide open to southerly and westerly storms, and due to lack of protection is not recommended as an anchorage except in northerly or easterly weather.

Mikhail Point marks the southeast approach to Etienne Bay. It is a broad, gently sloping headland with a terrace-sided shoulder near its northwest part.

A narrow-mouthed cove cuts into the southeast tip of Mikhail Point. This cove offers good protection to small boats, but the swinging room is very limited.

Mikhail Point should be given a berth of at least 0.5 mile by deep-draft vessels.

Abraham Bay, east of Mikhail Point, is the second major bay east of Cape Wrangell. It is wide-mouthed, narrowing to an inner arm at the northeast end. This arm has parallel shores and a short, sandy beach at its head. The mountains surrounding Abraham Bay rise steeply from the shoreline to between 1,500 and 2,000 feet high. The steep, rugged slopes of the inner arm give it a flordlike appearance.

An unusually large waterfall on the northwest shore of Abraham Bay, 2.5 miles east of Mikhail Point, is a conspicuous landmark, even to ships offshore.

A group of rocks and reefs mark the west side of the approach to the inner arm of Abraham Bay. The highest of these, a steep-sided rock 48 feet high, is an excellent landmark for vessels entering the bay. Vessels should steer a course to pass not less than 0.5 mile off this rock, rounding it at that distance and then heading toward the middle of the sand beach at the head of the inner arm. Anchorage is found east of the innermost low flat reef in 13 fathoms, gravel bottom. The holding properties are only fair. This anchorage offers some protection from north and east storms, but is exposed to the west and south. In addition, fierce strong winds often draw through the inner arm, when no winds are noticeable off the approaches to the bay.

The east shore is clear of danger except for the almost continuous string of reefs close inshore. The greatest dangers are the rocks almost 0.4 mile offshore 1 and 2.5 miles north of Chuniksak Point.

Chuniksak Point, between Abraham Bay and Nevidiskov Bay, is a broad, three-pointed promontory sloping moderately upward and back to two mountain ridges.

Small-boat landings have been made in the cove just northwest of the easternmost point of Chuniksak Point.

A current with a westerly set has been noticed close inshore around this point.

Nevidiskov Bay, on the southeast side of Chuniksak Point, is a fairly open, two-armed bay, surrounded by an irregular terrain of mountain ridges and valleys. Nevidiskov Bay is fairly clear of dangers and may be entered on any course, except that Chuniksak Point should be given a berth of at least 0.5 mile and Theodore Point a berth of at least 1 mile.

The steep sided, rocky islet, 38 feet high, south of the

point separating the two arms of the bay is a landmark for vessels entering the bay.

At the head of the east arm of Nevidiskov Bay is a flat, sandy beach. Vessels of any draft can anchor off this beach in 15 to 17 fathoms, 0.7 to 1 mile east of the 38-foot islet. The bottom is fine gray sand mixed with small round boulders. It has fair holding properties.

This bay offers shelter for any draft vessel from northwesterly through northeasterly to southeasterly storms. It is open and exposed, however, to storms from the southwesterly quadrant.

Low rocks and reefs fringe most of the east shore of the bay for as much as 0.3 mile offshore. Kelp is found over and around these rocks.

The west arm of Nevidiskov Bay is constricted and has a rocky, submerged ledge across its inner part.

Theodore Point, between Nevidiskov Bay and Temnac Bay, is a bluff promontory sloping moderately to a knoll-like shoulder and then steeply to the mountain ridge behind. Theodore Point is the southernmost promontory of Attu Island and the knoll-like shoulder is a conspicuous landmark for vessels southeast or southwest of the point.

Reefs and rocks fringe Theodore Point on all sides for about 0.3 mile. Kelp patches cover and surround most of these reefs. A dangerous pinnacle rock, covered 5 feet, is 0.5 mile southwest of the west end of the point.

Small boats have landed in the cove on the southwest side of Theodore Point.

Westerly currents were encountered close inshore off Theodore Point during the summer.

Fog covers the land above the 100- to 200-foot level much of the time in the late spring and summer.

Chart 9129.—Temnac Bay, the first bay westward of Massacre Bay on the south coast of Attu Island, is about 8 miles wide between Theodore Point on the west and Krasni Point on the east, and indents the island about 4 miles.

Coming from the east and Massacre Bay it is best to keep at least 1.5 miles off Krasni Point to clear the reef, which extends 1.2 miles south of the point, and the islands along the shore northwest of the point. A rock that uncovers 4 feet is 700 yards south of the westernmost island. The western shore should be given a berth of 0.8 mile until well into the head of the bay.

Large vessels can anchor about 1.5 miles from the head of the bay in 20 fathoms, fine gray sand bottom, of fair holding qualities. Smaller vessels can anchor farther in. The anchorage offers some shelter from strong southeasterly breezes. No williwaws were experienced while survey operations were in progress.

Temnac Bay is not, in general, recommended for anchorage but it might prove useful in an emergency, and it would be easy to get out of in case of undesirable weather conditions.

Chart 9147.—Agattu Island, lying about 22 miles south-eastward of Attu Island, is the second largest and the

southerly island of the Near Islands. This island is roughly triangular in shape with the north shore or base of the triangle trending in a west-southwest direction. The north shore is about 17 miles in length, the south shore 14 miles and the east shore 9 miles in length.

It is reported that at the time of the Russian voyages of discovery to Alaska that 35 native Aleutian villages were on the island. Many of the sites are in evidence at this time. The island is not at present populated.

The island is volcanic in origin, and similar in terrain, shoreline, and vegetation to the other islands of the Aleutians. Mountain peaks 1,992 feet high are adjacent to the east half of the north shore and 2,080 feet to the southward. The shoreline is rocky and precipitous and fringed with close-inshore pinnacles. Boulder or pebble beaches are at the heads of most of the bights; frequently the boulders are outside the low water line which renders landing in small boats, except in a smooth sea, difficult. Water may be boated from streams in most of the bights. Most of the points rise 50 to 200 feet from the water to the land and then slope more gradually to the interior. The peaks are generally obscured by a low ceiling. For this reason the points are the most suitable features for navigational purposes. **Krugloi Point**, the northeastern end of the island; **Cape Subak**, the southeastern end of the island; and **Gillon Point**, the west end of the island, are hills and plateaus sloping to the water's edge or ending in sheer headlands. **Gillon Point** ends in a low flat-topped headland which appears separated from the island. **Nile Island**, 156 feet high, is about 2.5 miles west of Cape Subak and is prominent. **Gillon Point** should be given a berth of at least a mile and **Krugloi Point** 3 miles.

Armeria Point, 5 miles northeast of **Gillon Point**, is a sheer double pointed headland 100 feet high, fringed with high pinnacles, and rising to greater elevations a short distance inland. **Patricia Point**, 6 miles west of **Krugloi Point**, is low and slopes gradually back to the hills inland. **Nile Point** on the south side, 2.3 miles eastward of **Gillon Point**, is a bold headland. A dangerous breaker lies about one-half mile off this point. This is one of the off-lying dangers.

The hills and plateaus constituting most of the island give the appearance of flat tableland from a distance and in most of the areas are interspersed with numerous bays.

It is recommended that medium craft keep outside the 40-fathom curve around the island except when seeking water, and large craft outside the 40-fathom curve. All anchorages about the island are limited as to depth, but the island is not large and both medium and large craft can proceed to such anchorages as the prevailing weather requires.

The currents are weak and heavy tide rips will not be encountered about this island except in rare cases. **Patricia Bight** is the best anchorage off the north shore. Massive kelp beds make well out from the east side of this bight and a long reef makes out from about the west part in a northerly direction, ending in a rock shoal. This reef is surrounded by extensive kelp beds. Small craft may proceed to an inner an-

chorage east of this reef and into the deepest part of the bay. A fox farmer's cabin is at the head of this bight.

No evidence of kelp or dangers has been found in other parts of the bight except very close inshore. Large or medium craft should anchor in 15 to 20 fathoms, sand bottom, 0.5 to 0.8 mile off the west shore and about east of the end of **Patricia Point**. Shelter is afforded from southeast to southwest. Westerly and easterly swells and sea make into the bay.

Binnacle Bay is a bight 1 mile southwest of the end of **Patricia Point**. Kelp beds are off the north part of the east shore. A kelp bed also makes out from the point at the west side of the deepest part of the bay. The remainder of the area seems to be clear of kelp and anchorage can be had as needed in 17 to 21 fathoms, hard bottom.

In **Armeria Bay** no dangers were found outside the kelp area. A 10-fathom bank is 1.5 miles eastward of **Armeria Point**. Anchorage may be had 0.5 mile southeast of the bank in 24 to 25 fathoms, hard sand and rocky bottom.

West Cove, a two-armed bight 1.5 miles southwest of **Armeria Point**, is a fair anchorage for small craft. The bottom is hard and there is insufficient sea room for medium craft. Enter 200 to 300 yards eastward of an islet off the west side of the entrance. Anchor in the middle of the bay in 15 fathoms or as desired.

A bight on the south side of the island, 1.5 miles eastward of **Gillon Point**, is free of dangers except for the breaker off the end of **Nile Point**. Anchorage can be had in 17 fathoms, sand bottom, about 0.5 to 0.7 mile from the shore. The bottom is hard sand, scattered rocks and broken shell. Reefs are close inshore and a black detached islet is at the west side of the head of the bight.

Otkriti Bay, on the south side of **Agattu Island**, is the largest bay on the island affording any protection; it is about 1 mile long and 2 miles wide. Two long narrow islands extend westward from the eastern entrance point; the highest point, 83 feet, of the outer island is a good landmark. About 0.6 mile southwest of the outer island is a 1/2-fathom shoal which breaks in a moderate sea. Anchorage can be had in 20 fathoms, coarse sand and shell bottom, southwest of the bold point between **Karab Cove** and **Otkriti Bay** proper. Holding properties are fair, but there is no protection from the south and west.

Karab Cove, the bight on the east side of **Otkriti Bay**, is small—1 mile long and 0.5 mile wide—but affords the best protection of any anchorage on the island for vessels less than 125 feet in length; it is open only to the southwest. The anchorage is in the center of the cove in 12 fathoms, sand and gravel bottom; it is not recommended in southerly or southwesterly weather.

Agattu Roadstead, on the east side of **Agattu Island**, is an extensive open bight. Numerous monolithic pinnacles are along the shoreline; **Monolith Point**, which appears black against lighter background, is on the north side of the entrance to **McDonald Cove**. There are no dangers to navigation if the shoreline is given a berth of 0.5 mile.

southerly island of the Near Islands. This island is roughly triangular in shape with the north shore or base of the triangle trending in a west-southwest direction. The north shore is about 17 miles in length, the south shore 14 miles and the east shore 9 miles in length.

It is reported that at the time of the Russian voyages of discovery to Alaska that 35 native Aleutian villages were on the island. Many of the sites are in evidence at this time. The island is not at present populated.

The island is volcanic in origin, and similar in terrain, shoreline, and vegetation to the other islands of the Aleutians. Mountain peaks 1,992 feet high are adjacent to the east half of the north shore and 2,080 feet to the southwestward. The shoreline is rocky and precipitous and fringed with close-inshore pinnacles. Boulder or pebble beaches are at the heads of most of the bights; frequently the boulders are outside the low water line which renders landing in small boats, except in a smooth sea, difficult. Water may be boated from streams in most of the bights. Most of the points rise 50 to 200 feet from the water to the headlands and then slope more gradually to the interior.

The peaks are generally obscured by a low ceiling. For this reason the points are the most suitable features for navigational purposes. **Krugloi Point**, the northeastern end of the island; **Cape Sabak**, the southeastern end of the island; and **Gillon Point**, the west end of the island, are hills and plateaus sloping to the water's edge or ending in sheer headlands. **Gillon Point** ends in a low flat-topped headland which appears separated from the island. **Kohl Island**, 156 feet high, is about 2.5 miles west of Cape Sabak and is prominent. **Gillon Point** should be given a berth of at least a mile and **Krugloi Point** 3 miles.

Armeria Point, 5 miles northeast of **Gillon Point**, is a sheer double pointed headland 100 feet high, fringed with high pinnacles, and rising to greater elevations a short distance inland. **Patricia Point**, 6 miles west of **Krugloi Point**, is low and slopes gradually back to the hills inland.

Nile Point on the south side, 2.3 miles eastward of **Gillon Point**, is a bold headland. A dangerous breaker lies about one-half mile off this point. This is one of the few off-lying dangers.

The hills and plateaus constituting most of the island give the appearance of flat tableland from a distance but in most of the areas are interspersed with numerous valleys.

It is recommended that medium craft keep outside the 40-fathom curve around the island except when seeking shelter, and large craft outside the 40-fathom curve.

All anchorages about the island are limited as to shelter, but the island is not large and both medium and large craft can proceed to such anchorages as the prevailing weather requires.

The currents are weak and heavy tide rips will not be encountered about this island except in rare cases.

Patricia Bight is the best anchorage off the north shore. Extensive kelp beds make well out from the east side of this bight and a long reef makes out from about the deepest part in a northerly direction, ending in a rock which uncovers. This reef is surrounded by extensive kelp beds. Small craft may proceed to an inner an-

chorage east of this reef and into the deepest part of the bay. A fox farmer's cabin is at the head of this bight.

No evidence of kelp or dangers has been found in other parts of the bight except very close inshore. Large or medium craft should anchor in 15 to 20 fathoms, sand bottom, 0.5 to 0.8 mile off the west shore and about east of the end of **Patricia Point**. Shelter is afforded from southeast to southwest. Westerly and easterly swells and sea make into the bay.

Binnacle Bay is a bight 1 mile southwest of the end of **Patricia Point**. Kelp beds are off the north part of the east shore. A kelp bed also makes out from the point at the west side of the deepest part of the bay. The remainder of the area seems to be clear of kelp and anchorage can be had as needed in 17 to 21 fathoms, hard bottom.

In **Armeria Bay** no dangers were found outside the kelp area. A 10-fathom bank is 1.5 miles eastward of **Armeria Point**. Anchorage may be had 0.5 mile southeast of the bank in 24 to 25 fathoms, hard sand and rocky bottom.

West Cove, a two-armed bight 1.5 miles southwest of **Armeria Point**, is a fair anchorage for small craft. The bottom is hard and there is insufficient sea room for medium craft. Enter 200 to 300 yards eastward of an islet off the west side of the entrance. Anchor in the middle of the bay in 15 fathoms or as desired.

A bight on the south side of the island, 1.5 miles eastward of **Gillon Point**, is free of dangers except for the breaker off the end of **Nile Point**. Anchorage can be had in 17 fathoms, sand bottom, about 0.5 to 0.7 mile from the shore. The bottom is hard sand, scattered rocks and broken shell. Reefs are close inshore and a black detached islet is at the west side of the head of the bight.

Otkriti Bay, on the south side of **Agattu Island**, is the largest bay on the island affording any protection; it is about 1 mile long and 2 miles wide. Two long narrow islands extend westward from the eastern entrance point; the highest point, 83 feet, of the outer island is a good landmark. About 0.8 mile southwest of the outer island is a ½-fathom shoal which breaks in a moderate sea. Anchorage can be had in 20 fathoms, coarse sand and shell bottom, southwest of the bold point between **Karab Cove** and **Otkriti Bay** proper. Holding properties are fair, but there is no protection from the south and west.

Karab Cove, the bight on the east side of **Otkriti Bay**, is small—1 mile long and 0.5 mile wide—but affords the best protection of any anchorage on the island for vessels less than 125 feet in length; it is open only to the southwest. The anchorage is in the center of the cove in 12 fathoms, sand and gravel bottom; it is not recommended in southerly or southwesterly weather.

Agattu Roadstead, on the east side of **Agattu Island**, is an extensive open bight. Numerous monolithic pinnacles are along the shoreline; **Monolith Point**, which appears black against lighter background, is on the north side of the entrance to **McDonald Cove**. There are no dangers to navigation if the shoreline is given a berth of 0.5 mile.

The depth of the roadstead slopes gradually up from about 45 fathoms to 10 or 12 fathoms. The bottom is sand, although there is some rock opposite rocky promontories. Where there is sand it appears to be deep and affords good holding ground. Agattu Roadstead offers little protection from east and but little from north and south, but it is protected from the west, subject, however, to draw winds from that direction. The bight offers suitable anchorage for any type of vessel if weather conditions are favorable.

A good anchorage is available in this locality off

McDonald Cove in 15 to 20 fathoms, sand bottom. Depths seem to be suitable for anchorage alongshore for some distance towards Krugloi Point. Reefs, making out 0.3 to 0.5 mile from shore, extend for 2 miles from Krugloi Point.

Chart 9102.—The area west of Attu Island was surveyed to 170° E. in 1946. **Stalemate Bank**, 55 miles west of Cape Wrangell, Attu Island, is a large shoal area with a least depth of 18 fathoms.

8. BERING SEA

Chart 9302.—The southern limit of Bering Sea is a line running from Kabuch Point (54°49' N., 163°22' W.) in the Alaskan Peninsula, through the Aleutian Islands to the south extremes of the Komandorski Islands and on to Cape Kamchatka in such a way that all the narrow waters between Alaska and Kamchatka are included in the sea. The northern limit is Bering Strait.

Discussed here are the Alaska coast and off-lying islands of Bering Sea from Unimak Pass northward to Bering Strait. Much of this area has been only partially surveyed, and the charts must not be relied upon too closely, especially near shore. The currents are much influenced by the winds and are difficult to predict; dead reckoning is uncertain and safety depends upon constant vigilance.

The chapter area is entirely within the 100-fathom-depth curve, which extends northwestward from Unimak Pass and passes to the southwestward of the Pribilof Islands. Depths vary more or less uniformly in the open sea except near the off-lying islands, which are volcanic and rocky and range in height to more than 2,000 feet.

From the head of Bristol Bay to Norton Sound, shoals or banks formed by river deposit extend many miles from the mainland, in some places completely out of sight. Kuskokwim and Yukon Rivers are the principal drainage systems along this stretch of coast. As fog and thick weather are common during the navigation season, coasting vessels are advised to sound constantly and to stay in depths greater than 10 fathoms unless feeling their way in to the land.

Navigational aids are few. The rocky islands and the rocky parts of the mainland are frequented by thousands of birds whose constant cries may serve to indicate the approach to these places in thick weather. Port facilities are rare, and most of the villages scattered along the coast lighter their supplies from vessels anchored offshore. Good water can always be found in the vicinity of high land.

The navigation season depends largely upon ice conditions, discussed later. During the winter months, the ice and snow along the shore, as well as inland, are suitable for travel by dog team over many miles of established trail. Tractors could be driven over long stretches of this beach area when the lakes and protected bays are frozen solid enough to support them. Airplanes equipped with skis can also operate in winter from many points along the coastal and inland areas.

Currents.—Strong tidal currents flow through the Aleutian Islands passes, setting into Bering Sea on the flood and into the North Pacific Ocean on the ebb. Observed

velocities have exceeded 8 knots in some of the passes but the decrease is rapid once the passes are cleared. The tidal currents set northward and southward along the Bering coast and into and out of the various bays. The periodic tidal flow along the coast is completely masked at times by wind currents. In constricted bays the currents may have considerable velocities. The tidal current has an average velocity of 0.5 to 1 knot at the off-lying islands.

Most reports indicate that during the open season there is a general drift northward along the Bering coast and thence through Bering Strait into the Arctic Ocean. During the winter, ice moves from the Arctic into the Bering Sea. The northward drift is probably not more than 0.5 knot in the open sea well northward of the Aleutian passes. Wind and atmospheric pressure are said to materially affect the drift. In a disturbed area the current will generally set with a strong wind or toward an atmospheric depression, and such a current may serve as a storm warning.

Along the north side of Unimak Island, the currents are fairly strong and generally parallel the coast. They attain a maximum velocity of 2 knots a mile off Cape Mordvinof and probably do not exceed 2.5 knots anywhere along this coast. Velocities have been estimated at 2 to 2.5 knots as far as 12 miles from shore in depths of about 40 fathoms.

Between St. Matthew Island and Nunivak Island, the current sets northwest with prevailing northeast winds during the navigation season and northeast with northwest or southwest winds. This northerly current continues and increases between St. Lawrence Island and the mainland, being stronger toward the mainland north of Yukon River where it has a velocity of about 1 knot except in early summer when the Yukon freshets may increase it to 2 knots or more. A strong northward current, amounting at times to 2.5 knots, has been observed setting on the Yukon flats. The current sets north across Norton Sound to Sledge Island and is strongly marked along the coast between Sledge Island and Bering Strait.

Captain Covell, of the Coast Guard Cutter BEAR, said of the currents in this area. "After a southeast gale in the Bering Sea, during which the water is banked up against Siberia, a very marked current sets in the opposite direction. The reverse is true for a southwest gale. The exact interval between the gale and the strong countercurrent is, so far, undetermined. Of the existence of this countercurrent under such conditions, there is no doubt, and it demands consideration."