Steamer "C. P. Patterson"

Season of 1895.

Descriptive Report of Work

Chatham Strait.

E. K. Moore
Lieut. Comdr. U.S.N.
Chief of Party

By
H. L. Ford.

2234

Diag. Cht. No. 8252-1

Department of Commerce and Labor

COAST AND GEODETIC SURVEY

Superintendent.

State: Alaska

DESCRIPTIVE REPORT.

Hyd C Sheet No 2234

LOCALITY:

See

2233

1896

~~190~~

CHIEF OF PARTY:

E K Moore

2234

2235

Diag. Cht. No 8252-1

Department of Commerce and Labor
COAST AND GEODETIC SURVEY

Superintendent.

State: Alaska

DESCRIPTIVE REPORT.

Hyd C *Sheet No* 2235

LOCALITY:

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2233

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CHIEF OF PARTY:

EK Moore

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Diag. Cht. No. 8252-1

Department of Commerce and Labor

COAST AND GEODETIC SURVEY

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Superintendent.

State: Alaska

DESCRIPTIVE REPORT.

Hyd c *Sheet No* 2236

LOCALITY:

See

2233

1895

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CHIEF OF PARTY:

E K Moore

2236

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Diag. Cht. No 8252-1

Department of Commerce and Labor

COAST AND GEODETIC SURVEY

Superintendent.

State: Alaska

DESCRIPTIVE REPORT.

Hyd C *Sheet No* 2237

LOCALITY:

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CHIEF OF PARTY:

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Steamer "C. P. Patterson"

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Descriptive Report of Work.

Chatham Strait.

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By
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Statistics of Field Work executed by U.S. Coast Survey Steamer "Patterson"

Date of beginning field work	May 13, 1895
Date of closing field work	Oct 3, 1895
RECONNAISSANCE:	
Area of, in square statute miles	—
Lines of intervisibility determined as per sketch submitted	—
Number of points selected for scheme	—
BASE LINES:	
Primary, length of	700.24428
Secondary, length of	1350.48646
Beach measurements, length of	0
Number of days employed in measurements of base ~~12~~ 11 & 2nd	23
Number of days employed in re-measurements	—
TRIANGULATION:	
Area of, in square statute miles	572
Signal poles erected, number of 4.95, 0.1165	1260
Observing tripods and scaffolds built, number of	0
Observing tripods and scaffolds built, heights of	0
Days occupied in opening and verifying lines of sight, number of	0
Stations occupied for horizontal measures, number of 4.117 0.996	1113
Stations occupied for vertical measures, number of	172
Geographical positions determined, number of	0
Elevations determined trigonometrically, number of	315
GEODESIC LEVELING:	
Elevations determined by spirit-leveling of precision, number of	—
Lines of geodesic leveling, length of	—
LATITUDE, LONGITUDE, AND AZIMUTH WORK:	
Latitude stations occupied, number of	2
Pairs of stars observed for latitude, number of	58
Average number of observations on a pair	1.7
Longitude stations, telegraphic, number of	0
Longitude stations, telegraphic, number of nights on which signals were exchanged	0
Longitude stations, chronometric, etc., number of	2
Azimuth stations, number of	2
Number of nights of observations for azimuth	2
Number of stars observed for azimuth	2

GRAVITY DETERMINATIONS:

Number of pendulum stations occupied	—

MAGNETIC WORK:

Stations occupied for observations of the magnetic declination, number of	1
Stations occupied for observations of the magnetic dip, number of	1
Stations occupied for observations of the magnetic intensity, number of	1

TOPOGRAPHY:

Area surveyed in square statute miles	406 1/2
Length of general coast-line in statute miles	690
Length of shore-line of rivers in statute miles	0
Length of shore-line of creeks in statute miles	0
Length of shore-line of ponds in statute miles	0
Length of roads in statute miles	0
Topographic sheets finished, number of	5
Topographic sheets, scales of	1/10000 1/80000 1/40000 1/20000

Topographic sheets, limits and localities of:

Chatham Strait 1/80000 from Ignatius Passage to Pt. Gardner Peril Strait & Hoonich Sound, 1/40000, from Chatham Strait to Pogibshi Pt. Northern & Southern Rapids, 1/20000, from Pogibishi Pt. to Fish Pt., Nos 1 & 2, Hootznahoo Lagoon 1/10000

HYDROGRAPHY:

Area sounded in square geographical miles	400 1/2
Number of miles (geographical) run while sounding	2001 3/8
Number of angles measured	15008
Number of soundings	22740
Number of tidal stations established	2
Number of specimens of bottom preserved	47
Current stations, number of	2
Hydrographic sheets finished, number of	11
Hydrographic sheets, scales of	1/5000 1/10000 1/20000 1/40000 1/80000

Hydrographic sheets, limits and localities of:

Chatham Strait 1/80000, Pt. Samuel to Pt. Gardner; Peril Strait 1/40000 Pt Thatcher to Pt. Pogibshi; Hoonich Sound 1/40000, Pt. Emmons to head; Chatham & White water Bays 1/20000; Hootz Bay 1/20000; Kelp Bay 1/20000; Ja-Katz & Warm Springs Bays 1/10000; Nos 1 & 2 Hootznahoo Lagoon 1/10000; Northern Rapids, Pt. Pogibshi to Mountain Head, 1/20000, Southern Rapids, Mountain Head to Fish Pt. 1/50000

PHYSICAL HYDROGRAPHY:

Number of soundings on cross-sections	—
Current stations, number of	—
Deep-sea current stations, number of	—
Deep-sea surface current observations, number of	—
Deep-sea sub-surface current observations, number of	—
Number of observations of density of water	—
Number of observations of temperature of water	—
Tidal stations established, number of	—
Miles (geographical) run in deep-sea sounding	—
Number of deep-sea soundings	—
Number of specimens of bottom preserved	—

Locality of work; results, how shown, etc.:

For Sketch of Locality, see General Report.

Chatham Strait. Scale 1:80.000.

The ground covered by this sheet extends from Tenakee Passage southward to abreast Pt Gardner, a distance of 46 nautical miles. The upper portion of the sheet contains only topography, being the completion of the contour work, left unfinished at the close of the season of 1894. The remainder of the sheet, from Pt. Samuels to the southward represents the work of the present season.

The general character of the country does not differ materially from that surveyed in preceding years, and the methods heretofore pursued have been followed.

Considerable difficulty was experienced in securing a base of sufficient length to form well conditioned triangles for expanding to the main system of the triangulation. One was finally measured of 700.244 metres, the greater portion of which was under water at

high tide, on the eastern shore of Hoods Bay 2 1/8 miles south of Killisnoo. With the aid of a reef, covered at high water and sand island, this was carried out to Distant Pt. and Pt. Samuel, and no further trouble was experienced in the triangulation.

The theodolite was used in all the main triangulation, and for locating the entrance signals in the small bays and inlets. Inside these bays a secondary system of triangulation was carried on by means of the sextant, signals being built with a view of obtaining three good cuts on each for plotting them by the protractor, using the signals previously located by the theodolite as a base to work from.

The field shoreline has been run on 1. 40. 000 scale with the exception of Hoods Bay which is on a 1. 20. 000. The smooth hydrographic sheets are on different scales, and a list of them is appended.

The elevations were measured by the sextant, the only instrument on board which could be used for that purpose without the sacrifice of considerable time, which is of great value in this work, during the comparatively few days that the mountain tops are visible. It was impossible owing to the character of the country and the facilities at hand to carry the work any further in the interior than has been shown on the sheet. The principal peaks and prominent hills were first located and their elevations obtained by occupying a sufficient number of triangulation stations to give good intersecting cuts. These were plotted on the sheet, and the contouring with an interval of 200 feet was put in subsequently from the "Cosmos", locating the boat as in sounding, and then cutting on the changes of slope, knolls, and such irregularities as would give a sufficient number of points for putting in the curves. After locating the main

peaks, the contouring can be pushed ahead very rapidly.

On the eastern shore of Chatham Strait the mountains are not so abrupt or rugged as on the western side. The tops are nearly all rounded and bare, with the exception of grass and light underbrush. No general rule can be given for the height of the timber line, due largely to the prevalence of snowslides. The rest of the country is covered with a heavy growth of cedar, fir, spruce, maple, alder and blueberry bushes, greatly impeding travel. The highest peak on the eastern shore is between Cha-ik and Whidewater Bays, 3241 feet, and is an irregular, solitary mountain with two principal peaks. On the southern shore of Whidewater Bay, and making a prominent landmark for it, is a mountain 2438 feet high, called Table Mountain peculiarly eroded near the top as will be seen from the contouring. This is the only prominent

peak between Whitewater Bay and Ft. Gardner, the country being composed of low, rolling hills, heavily timbered, lacking individuality, and containing no prominent features.

On the western shore, with the exception of the country between Pt. Thatcher and Pt. Lull ("see Peril Straits sheet, scale 1/40.000.") the country is much more rugged and broken, many of the peaks reaching altitudes of 4000 feet, and apparently increasing in height to the southward. These peaks are nearly all bare and rocky, and covered with snow until late in the summer, some of them perpetually. A few remnants of glaciers can be seen in some of the upper gulches. The timber line proper is much lower here than on the eastern side, and above it the underbrush is also much lighter. This is due probably to the later melting of the snow and the greater frequence of snowslides.

"Owing to the unfavorable weather late in the season it was found impossible to finish the contouring south of Kelp Bay, although quite a number of peaks and elevations were located and determined."

Chatham Strait in the main is a clear honest sheet of water, most of the dangers to navigation lying well inshore, and generally inside of a line drawn from point to point. On the western shore from abreast Pt. Gardner to the southern point of Kelp Bay, there are no outlying dangers, and the reefs in the small bights are nearly all visible at half tide. About 2/3 of a mile S.E. ½ S. from Pt. Lull is a sunken rock, well marked by kelp and from here to Pt. Thatcher the shore should not be approached to within half a mile, as there are several reefs extending well off shore and the bottom is very irregular and foul. Although well marked by kelp there

may be some shoals undiscovered. Much of this Kelp is attached to small rocks and boulders, varying in size from a hen's egg to a brick, and under the influence of heavy seas, or strong tidal currents is very liable to drag anchor.

On the western shore, are three prominent land marks, six waterfalls. The first is four miles below the southern point of Kelp Bay, very high and visible for a considerable distance to the Northward, appearing as a white line or streak against the dark background of the hills. The second is a large but not particularly high waterfall at the head of Warmspring Bay, which is visible from Chatham Strait for a short distance to the southward of the Bay. The third is similar to the last in appearance in an open bight which has received the local name of Cascade Bay. This waterfall is visible from vessels bound north in mid—

channel up to a point 1/2 mile to the northward of a line drawn from Pt. Gardner at right angles to the general direction of the channel.

From Pt. Gardner to Pt. Wilson, the southern point of Wilson Cove, the shore is low except in one place noted on the chart, with no reefs or dangers making off to any extent.

Wilson's Cove, 8 miles above Pt. Gardner is an open, shallow bight about one mile deep with a width at its entrance of 2 miles. At its head is an extensive flat. On its southern shore are two small wooded islands, the inner one being much the higher and more heavily wooded of the two. In the entrance is an extensive reef, generally visible, but covered at the spring high waters, extending across the mouth for a distance of half a mile. The southern shore is very foul and rocky, and full of kelp, much of it being secured to small rocks and

boulders. On the northern shore are several caverns in the faces of the cliffs which are from 75 to 100 feet in height. Wilson Cove should be avoided as it affords no protection as an anchorage except from easterly winds, and is very foul, bottom showing in four or five fms. in many places.

Pt. Caution, 14 miles above Pt. Gardner, and 5 miles above Wilson Cove, is the southern point of Whitewater Bay. Two and one half miles south of it, a shoal extends off shore 1/3 of a mile from a small wooded islet, connected with the shore at low water, otherwise the shore is free from dangers between Pt. Caution and Wilson Cove. Directly behind Pt. Caution is the mountain previously referred to as marking the entrance to Whitewater Bay.

One sixth of a mile N.W. from Pt. Caution is a low, rocky, islet, bearing a single dead tree from which it derives the name of Lone Tree Id.

One and three quarter miles N ½ W. from Pt. Caution is Woody Point, with a small, rocky, wooded islet, ⅓ of a mile off shore. This is the northern point of Whitewater Bay.

Whitewater Bay extends in an easterly direction for a distance of 3 miles, terminating at its head in sand and gravel flats, and at high water connecting by a narrow passage with a lagoon about one mile in length by ½ mile in width, bare at low water.

One and one quarter miles from Pt. Caution, nearly in the middle, but a little nearer the southern shore, is Kealy Rock, low and bare surrounded by rocky ledges of small extent marked by kelps. On the northern shore, one mile S. E. from Woody Point is the Indian Village of Nettushkin, and from the point immediately to the westward of the village, a rocky ledge extends ½ mile in a S. W. by W. direction with a sunken rock one

quarter of a mile to the eastward of its seaward end, both well marked by Kelp. In other particulars the description of this Bay as given in the "Pacific Coast Pilot, Alaska, Part I." is very good.

From the rocky islet off Woody Point, distant 7/8 of a mile N. W. by N. is Russian Reef. The position of this reef on the published Charts is erroneous, as it has been placed much too far from shore, while in reality it is nearly on range between Pt. Caution and Distant Pt. This reef extends 3/4 mile in a general W. S. W. direction, showing partially at low water, and is well marked by Kelp. These rocks rise very abruptly from very deep water.

From Woody Pt., 2 1/2 miles N. E. 3/4 E. is Rocky Pt., the shore between being considerably indented by small open bights, with ledges extending well off shore at low water. There are also two small islands in this stretch, one close in—

shore, one mile S. ½ E. from Rocky Pt., and the other ½ mile S. ½ E. from Rocky Pt. From the latter island a rock, showing at half tide, lies N. W., distant ⅓ mile. A larger island distant one mile W. by N. from Rocky Pt. has also a ledge distant ¼ mile N. W. × W. showing at about half tide. This island, and the white cliffs 2 ¾ miles south of Distant Pt. mark the entrance to a bay known by the Indians as Cha-ik, of which Village and Rocky Points are the north and south points respectively. In a shallow bight just inside Village Pt. is an Indian Village, off which distant ½ mile S. E by E. is an extensive ledge surrounding a small low bare rocky island, with a narrow channel between it and the shore.

This bay is about 3 ½ miles in length and opens into an extensive flat at its head. On the north shore, 2 miles from Village Pt.,

is a bight, one mile in length in which is the anchorage. A low wooded island with a rock, visible at half tide and distant 300 yards in a S.W. direction from it, mark the southern point of the bight.

In the middle of the bay, 1¼ miles E. by N. from the rock off the Indian Village is a low wooded island with extensive ledges on the seaward side, and some detached rocks, showing at low water on the inshore end. Between this island and a little nearer the southern shore are two rocks, connected at low water. Beyond the island and these rocks toward the head of the Bay the bottom is very irregular, and visible in many places at a depth of 4 to 5 fms., and there is also an abundance of Kelp. There are several small islands and rocks near the head of the bay, and vessels are recommended to avoide passing beyond the island off the southern point of the anchorage, the island in the center and the

two rocks near the southern shore.

In the inlet on the northern shore, excellent holding ground in 12 fms., sticky bottom may be had, and although open to the southwest it affords good protection from all other directions, and it is doubtful if it would blow home in southeasterly weather, the only wind which could draw in.

Distant Point is 3½ miles N. N. W. ½ W. from Village Pt. and 4½ miles S. E. from Pt. Samuel. It marks the southern point of Kootz Bay, and directly behind it are two hills which lie between Cha-ik and Kootz Bay. The lower and more northern one lies directly behind the point, and from some points of view appears as a double peak of about 1000 feet elevation. The larger mountain is about 2200 feet in height, and is a single mountain rounded on top. Two and a half miles to the southward of Distant Pt., a spur of this mountain runs

towards the water and terminates abruptly in a whitish cliff, 800 feet high which has been previously referred to.

Kenasnow Island is low, and at its western end is about 300 feet high and heavily wooded. Much of the timber on the eastern end has been logged. Killisnoo, the location of the Alaska Oil and Guano Company, and the U.S. Post Office, is situated on the northern and eastern end. Point Samuel is the western point of the island and the northern point of Kootz Bay.

From the entrance, Kootz Bay is about 11 miles long to the head of the southern arm and about 10 miles to the head of the northern arm. In the entrance are numerous rocks and reefs, those visible lying close to the eastern shore, and parallel with it for a distance of two miles, with a clear but narrow channel between them and the shore. Five eighths of a mile N ½ E. from

Distant Pt. and fully a third of a mile off shore is a sunken rock well marked by kelp, and care should be taken in rounding this point either in entering or leaving to give it a good berth.

Five miles inside on the northern shore is a low wooded peninsula, off which in mid channel are three rocks showing at low water. Two are comparatively small and close together, and about 300 yards nearer the entrance than the larger one which covers at nearly high water. The bight to the northward of the peninsula is small and full of rocks and reefs. Several houses and shacks are located here.

In proceeding up the bay the channel lies between the rocks and the southern shore. One and one quarter mile further in on the northern shore, and distant off shore some 300 yards are two rocks, visible at low water. One half mile beyond, the bay divides in two arms, a small, bare, rocky island lying about 200

yards off the dividing point. A ledge connected with the shore at low water makes off for a short distance from a point just inside the north arm on its northern shore, but otherwise this arm is clear and affords an anchorage in 15 to 20 fms. soft bottom, at its head. The southern arm is also free from dangers, and gives an anchorage at its head in 15 to 20 fms., soft bottom.

Table Island, low and sandy, with extensive reefs bare at low water lies 3/8 mile south of Kenasnow Id.. A clear channel is between it and Kenasnow Id. leading to the anchorage off Killisnoo. The ledges off the southeastern point of Kenasnow Id. are marked by a beacon, and Lone Rock, visible at half tide is marked by a second class nun buoy, painted red.

Sand Island, one mile E by S. from Table Id., is the northern point of the reefs and ledges extending along the eastern shore previously

referred to. Between ish and Table Id. is a clear channel with 7 fms. leading to the anchorage off Killisnoo. The directions in the published sailing directions call for no changes, except as regards the buoy on Lone Rock, which was referred to in the report of the seasons work for 1894.

From Pt. Gardner to Pt. Samuel, the eastern shore of Chatham Strait is remarkable for many tide rips. On a calm night, the noise of them is heard distinctly at a distance of a mile. These tide rips occur off nearly all the points and reefs, being particularly noticeable in the vicinity of Cha-ik bay, Russian Reef, Pt. Caution, the reef in the entrance to Wilson Cove, and the points to the southward. They frequently extend a mile off shore, and at spring tides show much broken white water.

On the western shore of Chatham Strait between Pt. Thatcher and Pt. Lull there are no prominent indentations. Between Pt. Lull and

South Point is Kelp Bay, which consists of a basin from which extend in different directions three arms. The northern one begins 3½ miles from Pt. Lull and runs in a Westerly direction for 3½ miles. At its head is an extensive flat that runs through and at high water, spring tides, connects with a similar flat in Kaims Bay, in Peril Strait. At the highest tides there are probably from 3 to 4 fms of water on this flat, judging from the height of the sea-weed and drift wood, but on the ordinary high waters there are but a few inches. At low water, from the head of this arm to Kaims Bay is a distance of 1¾ miles.

Considerable logging has been done near the head, a large amount of cedar having been cut and rafted during this season. A short distance inside the entrance, close to the northern shore and connected with it at low water is a small, low wooded island. One and one quarter miles further in, is another wooded island

connected with the northern shore at low water, with several bare rocks close to its eastern end. Abreast this island on the southern shore a ledge makes off, some 300 yards, otherwise there is a clear channel to the head. The anchorage is not recommended in this arm except for small craft, that will find fair holding ground in from 8 to 10 fms. Scant swinging room will prevent its use by large vessels.

Off the point separating this arm from the next one to the southward, spoken of in the records as "Middle Arm," ledges visible at low water extend for 150 yards. This arm is clear from its entrance to its head where it opens out into a moderate sized flat. It is about 5 miles in length and curves slightly toward the southward. With the exception of a shallow open bight, about 1/2 miles inside on the southern shore, containing an extensive sand flat this arm

is devoid of any particular feature of intrest. It affords a good anchorage near the head in 12 to 18 fms., soft bottom.

The southern arm extends 3/2 miles in a southerly direction curving slightly to the southeastward, 200 yards off its eastern point is a sunken rock marked by kelp, clear of a midchannel course, although the western shore should be slightly favored in entering. On the eastern shore, a half mile from the entrance are several small wooded islets, connected with the shore at low water. A small open bight is half mile beyond them on the same shore. Abreast the islands and on the northern shore are several landslides, on the face of a steep hill which shows plainly from Chatham Strait. Two miles from the head, a point extending from the northern shore constricts the channel to a width of less than a quarter of a mile, beyond which it expands

to a width of two thirds of a mile terminating ab its head in extensive flats. The anchorage is ab the head in 10 to 15 fms, soft bottom.

500 yards, S.E. ½ E. from Portage Pt. is a sunken rock.

One mile S. by W. from Portage Pt. is Plover Rock, a small but prominent rock, bare, with ledges of small extent. Near its are two, covred at one third tide. The first is distand 200 yard E.N.E. ½ E., and the second is distant 750 yards S by E ½ E. from Plover Rock.

From the southern point of the south arm to South Pt. the shore forms a bight, 1½ miles deep and 3½ miles wide from Point to Point. Across the entrance of this bight and affording protection as an anchorage, extend several islands, the largest one lying close to shore near South Pt. and a group of three lying off its western end, with a narrow channel between. These islands are all low and wooded, the large one containing

two small lakes. Opposite the entrance to this narrow channel, on the north shore, 2 miles from Pt. Lull is a prominent whitish cliff, 800 feet high. Several sunken rocks were found in this channel. Three quarters of a mile from North Point, N. W. by W. 1/4 W., is a sunken rock with a four fathom shoal between it and the point.

The shores of Kelp Bay are very abrupt and steep, and the northern shore is practically straight. From Pt. Caution in Chatham Strait a line drawn through the portage in the northern arm, passes near by through Broad Id. in Peril Strait and the head of Hoonicah Sound, a clear line 55 miles in length. Immediatly to the westward of Point Lull is a narrow bight extending in a northwesterly direction for 3/4 of a mile. This is full of kelp, open to the southward, and affords temporary shelter for small craft only.

Between Pond Id., and the south shore is

a narrow passage, full of rocks and Kelp.
This is navigable by small boats, but should not be attempted by large vessels.

One and one half miles to the southward of South Pt., a narrow inlet extends for 1½ miles to the westward. A small rocky wooded islet lies close to its northern point connecting at low tide. Two hundred yards southeast is a bare rock, "the site of triangulation signal "Kelp"" with a ledge extending 150 yards to the southward. The entrance to the bight is from the southward, and it affords good shelter for small vessels, but is too narrow to give swinging room for vessels of any size.

For a distance of a mile below this bight the shore is straight, but from there to Ta-Katz Bay, a distance of 4 miles the shore is much broken by bights, with several wooded islands and bare rocks lying close to shore. The cliffs

are very precipitous, and several rather large waterfalls were noticed, one of which is very prominent and has been referred to as one of the landmarks in this vicinity.

Ta-Katz (called in the records S. Bay) Bay extends in a westerly direction, curving slightly to the southward for two miles, and then turns abruptly to the northward for another mile terminating in a flat formed by a mountain stream emptying into it as a waterfall. This stream is evidently fed by a glacier as the water on ebb tide is milky at the entrance of the bay.

Pt. Turbot is the northern point, off which at a distance of 75 yards is a large white rock "the site of triangulation signal "Turbot." S.E. 1/2 S. From this rock, distant 250 yards is a rock bare at half tide. Off the southern point of the bay are four bare rocks, whitish

in appearance and about 25 feet above water. On a line from Pt. Turbot to the southern point, are two of them close together, and distant from the southern point 300 yards, with reefs between them and the point, showing at low water. The other two rocks are 600 yards to the westward.

The southern shore of the bay is formed by a peninsula which also forms the northern shore of a bight to the southward with a group of small islands in its entrance. This bight does not appear to afford either shelter or an anchorage, the water being deep, and Kelp fairly abundant.

Off the southern point of the bight and to the southward of the group of islands is a rock, bare at low water, 400 yards from shore.

Ta-Katz Bay affords a good anchorage in 20 fms. soft bottom, in the basin that opens out just before the turn to the northward.

Chatham Strait is shut out entirely from

the anchorage by the southerly curve of the Bay, and the high surrounding hills give complete protection from all winds.

Warm Spring Bay. Four miles below Point Turbot is the northern point of a small bay called in the records "Cascade Bay", two miles in length, extending to the westward. At its entrance the bay is nearly a mile wide, but the channel is narrowed to a half mile by a peninsula projecting from the northern shore. Nearly halfway between the two entrance points, and 1/8 of a mile off the eastern point of the peninsula is a small bare rock about 15 feet above the water. On the southern shore are two small lights, and at its head a small lagoon to the left of the waterfall previously spoken of. This waterfall is the outlet of a lake, several miles long, about 200 feet above sea level. Near this waterfall and at same considerable height above it are several

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Between this bay and a point opposite Pt. Gardner,
are two open bights, both unsuited for ~~an~~ anchorages.

warm mineral springs, frequented by Indians on account of their medicinal properties. This bay affords an anchorage in 25 fms. rocky bottom beyond the peninsula and abreast the second bight on the southern shore. While affording fair shelter from northerly winds, in southerly weather the wind and sea draw in around the southern point. This coupled with rather poor holding ground and deep water, render it undesirable as an anchorage in bad weather.

"Between this bay, and the end of the season's work abreast Pt. Gardner are two open bights, both unsuited for anchorages." The southern one is called Cascade Bay, from the very prominent Waterfall at its head.

"The hydrography of Chatham Strait was executed in the same manner as has been customary in this work in preceding years. The wire reel was used in all the work

except in the development of such rocks and shoals that necessitated the use of the hand lead. In the main channel where the depths ranged from 450 to 300 fms., the lines were run normal to the channel and a sounding taken every 3/4 of a mile, the lines being 3/4 of a mile apart. On nearing the shore and passing the hundred fms. curve the soundings were spaced much closer, and intermediate lines or splits, normal to the channel were run between the main lines.

In some places this system was replaced by parallel lines, close to and following the shore. Anything tending to show the existence of a shoal was carefully examined, and in the neighborhood of Russian Reef and similar places the sounding was close and thorough. in order to define the limits of the danger as accurately as possible. In Roof Bay and other inlets the hydrography was much closer than in the

main channel, and work was executed on larger scale sheets, the smooth hydrographic sheets sent in being also on larger scale, in many cases, larger than the field shoreline."

The handlead is of little use to navigators in these waters in thick weather, 20 and 30 fms. being found frequently at that distance from shore, while a quarter of a mile from the beach, 100 to 200 fms. are not at all unusual.

One almost universal feature which exists in these waters, is the occurrence of sand and gravel flats, with one or more small streams at the head of all bights and inlets. The slope from 8 to 10 fms., to a few feet is very abrupt, and in approaching the head of an inlet at high water, care should be exercised in anchoring to give the flats sufficient berth to avoid grounding at low water. Nearly all afford good holding ground, in soft or stiffy bottom within a short distance of the head.

Hootznahoo Inlet, Scale 1:10.000"

Hootznahoo Inlet, comprising an area of about 15 square miles, is a group of lagoons and bays on the eastern shore of Chatham Strait 2 3/4 miles above Killisnoo. It consists of five principal divisions, full of rocks, reefs and shoals, connected by narrow channels through which the tide flows with great force, attaining at times a velocity of from 10 to 12 knots per hour.

The entrance to these lagoons is between Danger Pt. and Hootznahoo Head, and from the entrance extends in a general E.y. direction for 3 1/2 miles, where it opens out into a small bay called Favorite Bay by the Alaska Oil and Guano Co. who use it considerably as a fishing ground for herring.
One and one half miles from the entrance on the north shore, and extending to the northward are two arms, the western one being almost straight, with the exception of a small bight on its western

shore, and connecting with Mitchell Bay. The eastern arm joins the western at Ft. Pillsbury, above the end of Long Island which lies between the arms. On the eastern shore of this arm is a small passage opening into a lagoon that at high water connects at its southeast end by a passage with Favorite Bay. At its northern end it connects by a narrow passage with a lagoon opening into Mitchell Bay.

Mitchell Bay, the largest of the divisions of this inlet is about 4 1/2 miles in length by an average width of 1 1/2 miles. At its southwest end it is connected with a lagoon so full of rocks, reefs and shallow water that soundings were considered unnecessary. At its southeast end it is connected by Davis Creek to Kanal-koo Bay, and Lighter Creek. At its northern end it is connected by a lagoon, impassable except at high water by small boats, which is

said to connect with a series of lakes in the interior of Admiralty Island.

It is impossible to give more than a general description of this mixed up mass of islands, rocks, and water, as a much better idea can be obtained from the accompanying sheets.

The general character of the country is low and rather heavily wooded, except where otherwise noted, and the absence of prominent features render it impossible to give ranges that would be of much service to the navigator. The names have been taken from the description of this place written by Captain Meade, U.S.N., who navigated these channels in 1869, in the U.S.S. "Saginaw", and his description is apparently very full and complete.

At the present time there seems to be little to induce a vessel to enter these waters. The indications of coal, or more properly lignite

are numerous, but the mines have not been worked for a number of years, and any subsequent development of them would not depend upon these waters as a means of disposing of their output since a short railway system of a few miles would lead directly to Chatham Strait abreast Killisnoo.

"A description, and such sailing directions as could be given, by Ensign W. B. Haggatt, U.S.N. who had charge of this work accompanies this."

"The triangulation work was carried in from Chatham Strait, and depends on the work of the season of 1894, the theodolite being used as far as Pt. Sullivan, and the remainder being done by the sextant. The sheets used in plotting this work have been tested and up to the present time show but little change due to warping and contraction. The utmost care was exercised in plotting this work, and it is believed that

the Office will obtain better results if these sheets are used, considering them as plane table sheets, than by replotting the work.

By Ensign W. B. Goggatt.

On the northside of Danger Pt. is the narrow entrance to an extensive system of inlets and lagoons, called by the Indians, Kootznahoo.

The entrance is about one half mile wide, gradually narrowing, but free from obstructions until Village Rock is reached. This is a large low water ledge making out from an Indian village on the south shore towards Turn Pt. on the northshore.

This ledge obstructs more than one half the channel, and the strength of the tide, causes a very strong current, running at times probably as high as eight knots, with large swirls where the current impinges upon the larger and slower moving body of water.

Beyond Village Rock, to the eastward, the channel is clear on the south side well in towards the shore line, but on the north side is obstructed by a ledge, marked by Kelp at slack water, making out from Turn Pt. terminating in a large round top rock, which covers

at high water and upon which a spindle has been placed by the Alaska Oil and Guano Co.

One fourth mile beyond this rock begins a series of rocks, uncovered at low water extending to the unbroken shore line on the south side of the channel leading into Favorite Bay, in a line with this shore, the spindle and Turn Pt. At the spindle rock the channel branches in three directions, one continues to the eastward past Sullivans Pt., which has been prospected for coal, and leads in to Favorite Bay, a large lagoon filled with herring during the season. The other two go to the northward and eastward on either side of a large wooded island.

The eastern of these passages is obstructed at the south end except for small boats and at the north end of the island divides, one branch re-uniting at Pt. Pillsbury with the main passage leading into Mitchell Bay, the other going through a very narrow channel into a large lagoon

full of rocks and reefs and unnavigable except for small craft. This lagoon is connected at its southeast corner by a high water passage with Favorite Bay and on its northeast side past a series of islands and broken reefs with Hitchell Bay.

From the spindle or Rose Rock the western most branch turns sharply to the westward along the reef making out from Turn Pt. thence to the northward and eastward for five miles when it opens into Hitchell Bay. One and one fourth miles above Turn Pt. this channel runs between a ledge of rock making off to the southward from Pt. Pillsbury and a round, bluff, high water island, thence for one half mile between reefs to Pt. Bridge, where it runs between a reef on the west side and a bold bank on the east side, into a narrow channel with steep, bold shores on either hand.

Three fourths of a mile above Pt. Bridge the

channel broadens to a width of one fourth mile until near the entrance to Mitchell Bay when it is again confined between a ledge making off to the southward from North Pt., and a system of high water islands to the eastward. Beyond North Pt. is Mitchell Bay, which extends to the northward and eastward a distance of four and one half miles, with a width of one and one half miles. At its southside to narrow channels at the north and leading over rapids into a system of lagoons fed by a large stream, said to have its source in lakes near the middle of the island.

At the southeast angle of this bay is a narrow passage called Davis Creek, which after running in a southeast direction through a very good channel turns back upon itself and widens into a clear open basin, called Kawaihoo Bay, at the head of which are two large streams. One half mile from the north end of Davis Creek,

Lighter Creek makes off, having from 2½ fms. to 5 fms. of water at high tide.

The southshore of Mitchell Bay is very foul and while there is an ebb and flow of tide from Kootznahoo Head to Mitchell Bay, to the eastward of the main passage there is no channel for any sort of craft larger than row boats and canoes.

Near the west side of Mitchell Bay and one and one fourth miles from the entrance is Diamond Id, a long narrow island, sparsely wooded, with a large timber fall. To the eastward of this island and in a line parallel with the southshore of the bay are two islands, one, a small round high water island without timber, the other larger and covered with a dense growth of timber.

To the northward of these islands there is a larger island with a confined channel to the west of it.

At the entrance to Davis Creek is a high water island called by Captain Meade Passage Islet.

A large stream empties into Davis Creek at its north end near which in Mitchell Bay a good anchorage may be had in from ten to twenty fms. of water.

The tides in this system of lagoons continue to run from one hour to one and one half hours after the change at Rootznahoo Head, or even longer. Slack water will be found at Village Rock in the narrows at Pts Pillsbury and Bridge at North Pt. and at the south entrance to the middle lagoon from one hour to one and one half hours after the change of tide at Rootznahoo Head. Slack water at the north end of Davis Creek occurs half an hour after high or low water in Mitchell Bay.

Vessels rounding Rose Rock at slack water would carry slack water all the way to Mitchell Bay. At Village Rock the currents runs from five to eight knots, at Pt. Bridge as high as ten knots and at Passage Islet as high as seven knots.

Coal has been found in small quantities about the entrance to Davis and Lighter Creeks, at the southeast corner of Kawaihoa Bay and in the middle lagoon.

Several abandoned tunnels and shafts appear about Davis and Lighter Creeks.

Very respectfully
C. K. Moore

LIEUT. COM'D'R U. S. N. COM'D'G U. S. C. & G. S. PATTERSON