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Form 504

U. S. COAST AND GEODETIC SURVEY

DEPARTMENT OF COMMERCE

DESCRIPTIVE REPORT

Type of Survey Topographic

Field No. ..... Office No. 2295

LOCALITY

State Alaska

General locality St Paul Island

Locality Pribilof Group
Bering Sea.

~~194~~
1891

CHIEF OF PARTY

Will Ward Duffield

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U. S. COAST AND GEODETIC SURVEY.

W. W. Duffield,

State: Alaska

DESCRIPTIVE REPORT.

Topographic *Sheet No.* 2295, 2277, 2278, 2274, 2279, 2276, 2280, 2283, 2285, and 2284.

LOCALITY:

St. Paul Island,

Pribilof Group,

Bering Sea, Alaska.

Duplicate.

1897.

CHIEF OF PARTY:

Will Ward Duffield, Assistant.

2295

Descriptive Report to accompany Topographic Sheet No. 2295, St. Paul Island, Bering Sea, Alaska, scale 1-20,000, surveyed in 1897:

also,

of nine (9) Topographic Sheets of Seal Rookeries on St. Paul Island, as follows:

Sheet No. 2277, Zapadni Rookery,

" No. 2278, Little Zapadni and Zapadni Reef Rookeries,

" No. 2274, Tolstoi Rookery,

" No. 2279, Lagoon Rookery,

" No. 2276, Gorbatch, Ardiguen, and Reef Rookeries,

" No. 2280, Kitovi and Lukanin Rookeries,

" No. 2283, Polovina, Polovina Cliffs, and Little Polovina Rookeries,

" No. 2285, Morjovi Rookery, N. E. Point, East Sheet,

" No. 2284, Vostochni Rookery, N. E. Point, West Sheet.

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The Island of St. Paul, one of the Pribilof Group, lies in Bering Sea some 225 miles Northwest of Unalaska Island, of the Aleutian chain, which is the nearest land to the Southward, and 195 miles Southwest of Nunivak Island, which is the nearest land in that direction. The extreme length of the island, from Southwest Point to Northeast Point, is 13-1/2 miles, while its extreme width, from Reef Point to Severnoye Point, is 7-3/4 miles.

SHORE-LINE.

In general, it may be said that the shore-line of the Western half of the island is bluff and rocky, while that of the Eastern half is low and sandy.

Beginning at the western extremity of the sand beach forming the shore of Lukanin Bay, and extending westward around Reef Point and thence northward to English Bay, the shore-line is mostly rocky, with boulder beaches for a good part of the distance, and broken by three prominent bluffs - Black Bluffs, the village bluffs, and the bluffs of Tolstoi Point. The first two rise to a height of about 100 feet, and the latter reaches a maximum elevation of about 150 feet. The shore of English Bay is formed by the sands of Middle Hill, the boulder beach of Zapadni Reef Rookery, the rocky shore of Little Zapadni Rookery, the sandy beach of Southwest Bay, and the rocky

shore of Zapadni Rookery. These begin the Zapadni Bluffs, which extend around Zapadni Point and end opposite the south shore of Antone Lake. At the highest point these bluffs are a little over 100 feet high.

Separating Antone Lake from the sea is a boulder beach with a crest line about 21 feet above high water, which has been cited as an evidence of a rise of the island since its first upheaval. It may be questioned whether the height of this beach is not due to the action of the surf and ice during heavy southwest winter gales. It is well known that the sea breaks clean over the beach, separating the Salt Lagoon from Village Cove, which is similar in character and but seven or eight feet lower, during heavy gales. So also the seas sweep over Walrus Island, and along its northern part wave-worn boulders, piled to a height of thirty feet or more, testify to the power of the waves. They have undoubtedly sufficient force to form the beach in question without assuming an upheaval to account for its existence.

From Antone Lake westward to Southwest Point, the coast line is rocky with a bluff of moderate height. The highest part of this bluff is south of Ridge Wall, where it reaches a height of about 80 feet.

Off Southwest Point a sunken reef extends in a southwest-

erly direction nearly 700 metres, as shown by the breakers at the time this part of the shore line was surveyed. Older maps indicate a still grea ter seaward extent of this danger, and it is quite likely that had the sea been rougher at the time, our observations would have shown that shoal water exists at a greater distance from the Point.

From Southwest Point to the western end of Lincoln Bight is one continuous bluff. Opposite Rush Hills the bluffs reach an altitude of 379 feet. Great numbers of sea fowl nest along these precipitous cliffs. The shore of Lincoln Bight is principally cobble beach. To the eastward a succession of cobble beaches, low bluffs, and strips of sandy beach extend to a point about three-quarters of a mile beyond Severnoye Point. Along this stretch of coast there are a few outlying sunken rocks, none, however, that showed in the smooth sea at the time of the survey at a greater distance than an eighth of a mile off shore. Two rocky reefs extend about 150 metres off shore, one 550 metres, and the other 1400 metres west of Severnoye Point.

Three quarters of a mile East of Severnoye Point begins a sand beach which sweeps in a gentle curve for a distance of 6-1/3 miles to a point opposite Webster Lake, where the Vostochni Rookery begins. This beach has a succession of high

grass - covered sand dunes back of it - except at the narrow neck connecting Vostochni with the main part of the island, where the sands are low, and where the winter storms send the surf clear across at times, thus uncovering buried walrus skeletons and revealing the hidden ivory tusks to the natives, who eagerly search for them. In earlier times this neck was undoubtedly a walrus rookery.

Around Vostochni the shore line is made up of cobble and boulder beaches, with a few rocky ledges and rocky bluffs of slight elevation, and one strip of sand beach near Sea Lion Neck.

Almost due North from Hutchinson's Hill, and over a mile off shore, extensive kelp patches indicate shallow water and rocky bottom. So also southeast of Sea Lion Neck, and from 400 to 600 metres off shore, kelp patches exist. Owing to the indefinite outlines of the patches and the distance of these on the North shore, it was impracticable to locate them exactly on the sheet, and the position as indicated must be considered approximate. But they are sufficient to warn navigators to give the point a wide berth. No breakers were seen off this point during the progress of the survey. Tide rips, however, were formed by the strong tidal currents. Captain

Hooper, of the Revenue Cutter Service, states that he has seen it break more than a mile off Northeast Point in heavy weather.

From a point south of Webster Lake, a smooth sand beach extends southeastward for about 3-1/2 miles. Like the beach on the north shore, this is backed by grass-covered sand dunes. A cobble or boulder beach three quarters of a mile long extends southward to the Little Polovina Rookery. From here to Polovina Point the shore line is rocky with a rocky bluff rising to a height of about 30 feet. Immediately at the Point is a flat rocky ledge of considerable extent that is awash at high tide.

Extending from Polovina Point to Stony Point is another stretch of sand beach, backed by dunes. At Stony Point, a boulder beach extends around the Point, and breakers off shore indicate shoal water. The shore of Lukanin Bay is a smooth sand beach with dunes inshore.

FORMATION OF THE ISLAND.

The Island is of volcanic origin. Scattered all over its surface are hills that still show more or less distinctly the forms of the craters that once belched forth the molten material of which the island is formed, and the outlines of the great central flow are still plainly to be traced. Of the

hills mentioned, Crater Hill is perhaps the best example. Quite an extensive lake now occupies the bed of the old crater. On Lake Hill and Polovina also old crater beds are now lakes. Lake Hill has no less than four of them. Rush Hill, Dot Hill, Cone Hill, North Hill, Low Hill, Slope Hill, Bogaslof, and Little Polovina all show remains of old craters.

DRAINAGE.

A remarkable feature of St. Paul is the utter absence of running streams. One would naturally expect to find water courses on an island of such size, but none exist. The cause lies in the fact that the water that falls on the island sinks among the rocks, volcanic cinders, and sands that make up its surface. The island is, however, tolerably well watered, for numerous lakes and ponds are distributed over it. All of these, except Antone Lake and the lake near Polovina, are fresh, and the waters can be used for drinking purposes. The two exceptions noted are rendered brackish by the ingress of sea water during high tides. The chain of lakes and ponds extending from Polovina to Telegraph Hill is peculiar. It was made use of in former years as a highway for the seals when they were driven from the eastern end of the island to the village to be slaughtered.

TRAVEL OVER THE ISLAND.

Except at low water and along the sand beaches of the shore, travel is difficult in any direction over the island. Around the shores a rank growth of grass, and farther back a coating of moss in which one sinks ankle deep, makes progress very laborious; while in the interior the slopes covered with loose angular rocks make walking exceedingly tiresome.

SEAL ROOKERIES.

St. Paul derives its importance from the fact that it is the largest of the Pribilof Group, and the home of the greater portion of the American fur seal herd. The fur seal rookeries are therefore the most important features of the island.

Beginning with the most western rookery and following the shoreline around from the South to the East, the rookeries are as follows:

ZAPADNI, Sheet No. 2277.

This rookery extends along the southeast shore of Zapadni Bluff, beginning about 300 metres to the Eastward of Zapadni Point and continuing around to the mouth of the little creek forming the outlet to Antone Lake, a distance of about 1100 metres. Back from the shore line the ground rises with a moderate slope to the height of about 100 feet at the crest of

the bluff. The rookery ground, however, does not extend all the way up the slope, but comprises a strip averaging in width some 200 metres, and having an elevation of some 40 to 60 feet at its inshore margin. The surface of the rrokery is diversified with rocky ledges, loose boulders, and sand patches.

LITTLE ZAPADNI, Sheet No. 2278.

This is separated from Zapadni by a strip of sand beach about 200 metres long. Beginning at the eastern end of this sheet the rookery extends along the shore for a distance of some 500 metres. Back from the shore the ground rises rapidly to a height of about 60 feet in a distance of about 100 metres to a bench or table of about the same width, and back of this is a second and still steeper rise of another 60 feet to the top of another table or mesa. The rookery occupies the lower slope up to the edge of the first table. The ground is rocky, consisting of ledges and loose boulders, and is free from sand patches.

ZAPADNI REEF, Sheet No. 2278.

To the eastward of Little Zapadni, a boulder beach extends for a distance of about 1300 metres to the beginning of the sands of Middle Hill. The beach rises to a crest nearly 10 feet in height at an average distance of about 15 metres from the high water line, and slopes down again a few feet to a

LAGOON, Sheet No. 2279.

Close to the village on the outside shore of the narrow strip of land separating the Salt Lagoon from Village Cove is located the Lagoon Rookery. It extends from the southeast extremity of Tolstoi Bluff to the end of the strip, a distance of about half a mile. In character this rookery resembles Zapadni Reef, having a similar boulder beach rising to a crest from 11 to 13 feet above high water and sloping back to a level strip behind.

level rocky plain behind. The seaward slope of this beach is occupied in places by harems of breeding seals.

TOLSTOI, Sheet No. 2274.

The northern limit of this rookery is somewhat indefinite, but it may be said to begin on the south slope of Middle Hill, where a large hauling ground exists. From here the sands of Middle Hill extend southward a little more than half a mile, when the shoreline changes in character to rocky, and makes an abrupt change in direction to the westward, and extends for a distance of another half mile to Tolstoi Point, which marks the western end of the rookery. Near Tolstoi Point the bluff rises so steep that it cannot be occupied by the seals, but some 300 or 400 metres to the eastward of the point it becomes less steep, and from here to the turn of the shoreline above mentioned the rookery extends well up the slope.

GORBATCH, Sheet No. 2276.

This rookery begins at the southern extremity of the Zoltoi Sands and extends southwesterly along the northwest slope shore of the Reef peninsular for a distance of about 1200 metres. For the first 450 metres of this distance the breeding ground of the rookery occupies a rocky beach at the base of a cliff ranging from about 20 to 40 feet in height, known as Zoltoi

Bluffs. Beyond the Bluffs the shore rises in a moderate slope and near the waters edge consists of rocky ledges and loose boulders. At the southwest end of the rookery, back from the ledges and rocks, is a moderate cinder slope leading up to what is known as the "Parade Ground".

ARDIGUEN, Sheet No. 2276.

This rookery lies to the westward of Gorbatch and to the north and east of the Reef peninsular. Some 160 metres from Reef Point there is a break in the bluff which extends along this part of the shore by means of which the seals can gain access to the bank above. This break has been named "The Slide". The territory of Ardiguen embraces the rocky beach beneath the bluff, "the slide", and also some ground at the head of"the slide". Its precise outline and limits cannot be given by the writer from lack of definite information. The rookery had, in former years, no separate existence, but was considered as part of the Reef rookery. It was isolated and named by the present Seal Commission.

SEA LION ROCK.

This little islet, south of Reef Point at a distance of about a quarter of a mile, is occupied by the seals during the season.

REEF, Sheet No. 2276.

From the extremity of the peninsular this rookery extends along the southern shore, and then northeastward to the beginning of the bluff that corresponds on the south shore to the Zoltoi Bluffs of the north shore, a distance of about 1200 metres. The rookery ground slopes very gently up from the waters edge, and is mostly covered with loose boulders. Rocky ledges occur at a few points. The ponds formerly existing about midway of the rookery have been drained.

KITOVI, Sheet No. 2280.

Beginning at a point about 200 metres northwest of Kitovi Point, and extending around this point to Lukanin Point, is Kitovi Rookery. Its shoreline has an extent of about 850 metres. In the vicinity of Kitovi Point, back from the rocky ledges forming it, the rookery ground resembles that of the greater number of rookeries on the island, being covered with loose boulders; but the greater part of the remainder of the rookery is made up of rocky ledges "faulted" in many places, thus producing little cliffs and shelves ranging in height from 2 to 20 feet. In this respect this rookery is unlike any other on the island. Except in the neighborhood of Kitovi Point, the rookery occupies merely a narrow strip along the shore.

LUKANIN, Sheet No. 2280.

Adjoins Kitovi on the North and entends a distance of about 500 metres to the commencement of the sandy beach forming the shores of Lukanin Bay. At the southern end the rookery extends well up to the steep slope of Lukanin Hill, among large loose boulders. Beginning a couple of hundred metres North from Lukanin Point and extending for about a hundred metres parallel with the shoreline and back about 20 metres from it, is a series of four eroded bluffs from 10 to 20 feet in height. Beyond these the rookery ground againswidens out and covers nearly all the East slope of the hill, the ground being covered with loose boulders.

POLOVINA, Sheet No. 2283.

This rookery begins about 300 metres West of Polovina Point and extends around the Point northeastward for a distance of nearly 1600 metres. The main part of the rookery is, however, in the immediate vicinity of Polovina Point and extends only about 200 metres beyond it. The remainder has been designated as Polovina Cliffs, and will be described below. At the southwest end of Polovina, and back from the sandy beach, is a mixed sandy and rocky hauling ground about 75 metres in extent. Then comes the breeding ground. The slope of the rookery is gentle, except in the immediate vicinity

of the point where a rocky cliff rises abruptly to a height of between 10 and 20 feet. Along the edge of this cliff the ledge outcrops, but the remaining surface of the rookery ground is mostly covered with small boulders.

POLOVINA CLIFFS, Sheet No. 2283.

This is the northern continuation of the Polovina Rookery. It consists, as its name implies, of a line of cliffs. Along most of their extent the cliffs consist of an eroded bank above sloping down to an outcropping ledge of rock, which in places is comparatively flat and smooth, and in others extremely rough and irregular. The outer edge of this ledge is, in general, a bluff descent to high water mark. In some places, however, a rocky beach lies below the bluff. At intervals along the bluff are low places and breaks, which furnish runways by which the seals gain access to the ledges and top of the bank. The number of seals frequenting the cliffs is comparatively insignificant.

LITTLE POLOVINA, Sheet No. 2283.

This rookery lies to the northeast of Polovina Cliffs and has a shoreline of about 275 metres. The southern portion of the rookery has a rocky bluff shoreline ranging from 10 to 30 feet in height. The elevation of the bluff diminishes as one goes North. Near the middle of the rookery a little cove

exists, and a break in the bluff furnishes a runway for the seals. The rocky point forming the north shore of the cove is terraced in steps so that the seals can also gain the bank at this place. Back from the ledges forming the immediate shoreline, the rookery ground is smooth earth partly covered with small to medium sized boulders.

MORJOVI, Sheet No. 2285, (N.E.Point,East Sheet.)

Beginning at the first rocky point South and West of Sea Lion Neck, this rookery extends along the shoreline to Northeast Point, a distance of about 2000 metres. Not all of this extent of shoreline is, however, occupied by the seals. At the extremity of Sea Lion Neck is a sea lion rookery from which the point derives its name; the sandy beach north of this neck is not suitable for breeding ground; and farther along towards the end of the rookery two rocky points are favorite resorts of the sea lions. The great body of seals occupying the rookery is massed on the slope of the slight ridge to the north of the sandy beach above mentioned.

VOSTOCHNI, Sheet No. 2284, (N.E.Point, West Sheet

Beginning at Northeast Point this rookery extends westward and southwest around Hutchinsons Hill to the sands forming the north shore of the island, a distance along the shore line of about 3000 metres. Practically the whole extent is

rookery ground, though the breeding ground is interrupted here and there by hauling grounds, and sea lions occupy a small portion of the shore. Close to Northeast Point, at the beginning of the rookery, is a short strip of beach where the sea lions breed, and the rocky ledge and reef on the northwest tip of Vostochin is another resort to which their title is undisputed by the seals. The great mass of the seals of this rookery occupy the shoreline and north and west slopes of Hutchinsons Hill. On the north slope especially the rookery ground reaches nearly to the summit of the Hill, and is densely crowded.

(Signed) Fremont Morse,

Assistant, U. S. C. & G. Survey.

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1858

U. S. COAST AND GEODETIC SURVEY.

W W Duffield, Superintendent.

State: Alaska.

DESCRIPTIVE REPORT.

Topographic Sheets Nos. 2295, 2277, 2278, 2274, 2279, 2276, 2286, 2283, 2284 & 2285.

LOCALITY:

St Paul Island
Pribilof Group
Bering Sea Alaska

Original

1897

CHIEF OF PARTY:

Wm Ward Duffield

2275

Descriptive Report to accompany the Topographical Sheet of St. Paul Island, Bering Sea. Scale $\frac{1}{20,000}$, 1891. (No 2295) also of nine Topographic Sheets of Seal Rookeries on St Paul Island

The island of St. Paul, one of the Pribilof Group, lies in Bering Sea some 225 miles Northwest of Unalaska island of the Aleutian chain, which is the nearest land to the Southward, and 195 miles Southwest of Nunivak island, which is the nearest land in that direction. The extreme length of the island, from Southwest Point to Northeast Point, is 13½ miles, while its extreme width, from Reef Point to Lovushoye Point, is 7¾ miles.

Shore-line: In general it may be said that the shore-line of the Western half of the island is bluff and rocky while that of the Eastern half is low and sandy.

Beginning at the Western extremity of the sand beach forming the shore of Lukanin Bay and extending Westward around Reef Point and thence Northward to English Bay the shore line is mostly rocky, with boulder beaches for a good part of the distance and broken by three prominent bluffs - Black Bluff, the village bluffs, and the bluffs of Poletoi Point. The first two rise to a height of about 100 ft, and the latter reaches a maximum elevation of about 150 ft. The shore of English Bay is formed by the sands of Middle Hill, the boulder beach of Zapadni Reef rookery, the rocky shore of Little Zapadni rookery, the sandy beach of Southwest Bay, and the rocky shore of Zapadni rookery. Then begin the Zapadni Bluffs which extend around

Zapadni Point and end opposite the south shore of Antoni Lake. At the highest point these bluffs are a little over 100 ft. high.

Separating Antoni Lake from the sea is a boulder beach with a crest line about 12 ft. above high water, which has been cited as evidence of a rise of the island since its first upheaval. It may be questioned whether the height of this beach is not due to the action of the surf and ice during heavy southwest winter gales. It is well known that the sea breaks clean over the beach separating the Salt Lagoon from Village Cove, which is similar in character and but seven or eight feet lower, during heavy gales. So also the seas sweep over Walrus Island, and along

its Northern part have many boulders piled to a height of 30 ft. or more testify to the power of the waves. They have undoubtedly sufficient force to form the beach in question, without assuming an upheaval to account for its existence.

From Anton Lake Westward to Southwest Point the coast line is rocky, with a bluff of moderate height. The highest part of this bluff is South of Ridge Trail, where it reaches a height of about 80 ft.

Off Southwest Point a sunken reef extends in a Southwesterly direction nearly 700 meters, as shown by the breakers at the time this part of the shore-line was surveyed. Older maps indicate a still greater seaward extent of this danger, and it is quite likely that had the

sea been rougher at the time, our observations would have shown that shoal water exists at a greater distance from the Point.

From Southwest Point to the Western end of Lincoln Bight is one continuous bluff. Opposite Rush Reefs the bluffs reach an altitude of 379 ft. Great numbers of sea fowl nest along these precipitous cliffs. The shore of Lincoln Bight is principally cobble beach. To the Eastward a succession of cobble beaches, low bluffs and strips of sandy beach extend to a point about three quarters of a mile beyond Serenoye Point. Along this stretch of coast there are a few outlying sunken rocks, none, however, that showed in the smooth sea at the time of the survey at a

greater distance than an eighth of a mile off shore. Two rocky reefs extend about 50 meters off shore, one 550 meters and the other 1400 meters West of Lexington Point.

Three quarters of a mile East of Lexington Point begins a sand beach which sweeps in a gentle curve for a distance of 6⅔ miles to a point opposite Webster Lake, where the Victoria rookery begins. This beach has a succession of high grass-covered sand dunes back of it, except at the narrow neck connecting Victoria with the main part of the island, where the sands are low, and where the winter storms send the surf clear across at times thus uncovering buried walrus skeletons and revealing the

hidden ivory tusks to the natives who eagerly search for them. In earlier times this neck was undoubtedly a walrus rookery.

Around Natchuni the shore line is made up of cobble and boulder beaches, with a few rocky ledges and rocky bluffs of slight elevation and one strip of sand beach near Kea Lein Neck.

Almost due North from Hutchinson's Knoll and over a mile off shore extensive kelp patches indicate shallow water and rocky bottom. So also South-east of Kea Lein Neck and from 400 M. to 600 M. off shore kelp patches exist. Owing to the indefinite outline of these patches and the distance of them on the North shore it was impracticable

to locate them exactly on the sheet, and the positions as indicated must be considered approximate. But they are sufficient to warn navigators to give the point a wide berth. No breakers were seen off this point during the progress of the survey. Tide rips, however, were formed by the strong tidal currents. Captain Hooper, of the Revenue Cutter Service, states that he has seen it break more than a mile off Northeast Point in heavy weather.

From a point South of Broken Lake a smooth sand beach extends Southeastward for about 3½ miles. Like the beach on the North shore this is backed by grass-covered sand dunes. A cobble or boulder beach three quarters of a mile long extends Southward to the Little

Polonia rookery. From here to Polonia Point the shore line is rocky with a rocky bluff rising to a height of about 30 ft. Immediately at the Point is a flat rocky ledge of considerable extent that is awash at high tide.

Extending from Polonia Point to Stony Point is another stretch of sand beach, backed by dunes. At Stony Point a boulder beach extends around the Point, and breakers off shore indicate shoal water. The shore of Lukanin Bay is a smooth sand beach with dunes inshore.

Formation of the Island: The island is of volcanic origin. Scattered all over its surface are hills that still show more or less distinctly the forms of the craters that once belched forth

the molten material of which the island is formed, and the outlines of the great central flow are still plainly to be traced. Of the hills mentioned Crater Hill is perhaps the best example. Quite an extensive lake now occupies the bed of the old crater. Our Lake Hill and Polonia also old crater beds are now lakes. Lake Keil has no less than four of them. Rush Keil, Dot Keil, Cone Keil, North Keil, Low Keil, Slope Keil, Bogaloff and Little Polonia all show remains of old craters.

Drainage: A remarkable feature of St. Paul is the utter absence of running streams. One would naturally expect to find water courses on an island of such size, but none exist. The cause lies in fact that the water that

falls on the island sinks among the rocks, volcanic cinders and sands that make up its surface. The island is, however, tolerably well watered. Numerous lakes and ponds are distributed over it. All these except Antone Lake and the lake near Polonia are fresh and the waters can be used for drinking purposes. The two exceptions noted are rendered brackish by the ingress of sea water during high tides. The chain of lakes and ponds extending from Polonia to Telegraph Hill is peculiar. It was made use of in former years as a highway for the seals when they were driven from the Eastern end of the island to the village to be slaughtered.

Travel over the Island: Except at low water and along the sand beaches of the

shore travel is difficult in any direction over the island. Around the shores a rank growth of grass and farther back a coating of moss in which one sinks ankle deep make progress very laborious; while in the interior the slopes covered with loose angular rocks make walking exceedingly tiresome.

Seal Rookeries.

St. Paul derives its importance from the fact of its being the largest of the Pribilof Group, and the home of the greater portion of the American fur seal herd. The fur seal rookeries are therefore the most important features of the island.

Beginning with the most Western rookery and following the shore line around by the South to the East the rookeries are as follows:

№ 2277

1- Zapadni: This rookery extends along the southeast shore of Zapadni Bluff, beginning about 300 meters to the Eastward of Zapadni Point and continuing around to the mouth of the little creek forming the outlet to Antonia Lake, a distance of about 1100 meters. Back from the shore line the ground rises with a moderate slope to a height of about 100 ft. at the crest of the bluff. The rookery ground, however, does not extend all the way up the slope but comprises a strip averaging in width some 200 meters, and having an elevation of from 40 ft. to 60 ft. at its inshore margin. The surface of the rookery is diversified with rocky ledges, loose boulders, and sand patches.

№ 2278

2- Little Zapadni: This is separated from Zapadni by a strip of sand beach about 200 meters long. Beginning at the Eastern

end of this beach the rookery extends along the shore for a distance of some 500 meters. Back from the shore the ground rises rapidly to a height of about 60 ft. in a distance of about 100 meters to a bench or table of about the same width, and back of this is a second and still steeper rise of another 60 ft. to the top of another table or mesa. The rookery occupies the lower slope up to the edge of the first table. The ground is rocky, consisting of ledges and loose boulders, and is free from sand patches.

3- Zapadni Reef. No. 2278. To the Eastward of Little Zapadni a boulder beach extends for a distance of about 1300 meters to the beginning of the sands of Middle Reef. The beach rises to a crest nearly 10 ft. in height at an average distance of about 15 meters from

the high water line, and slopes down again a few feet to a level rocky plain behind. The seaward slope of this beach is occupied in places by harems of breeding seals.

4 - Tolstoi: No 2274 The Northern limit of this rookery is somewhat indefinite, but it may be said to begin on the South slope of Middle Hill, where a large hauling ground exists. From here the sands of Middle Hill extend Southward a little more than half a mile, when the shore line changes in character to rocky and makes an abrupt change in direction to the Westward, and extends for a distance of another half mile to Tolstoi Point which marks the Western end of the rookery. Near Tolstoi Point the bluff rises so steep that it cannot be occupied by the seals, but some 300 M. or 400 M. to the Eastward of the point it becomes less steep, and from here to the turn of

the shore line above mentioned the rookery extends well up the slope.

5- Lagoon: № 2279 Close to the village on the outside shore of the narrow strip of land separating the Salt Lagoon from Village Cove is located the Lagoon rookery. It extends from the Southeast extremity of Poletoi Bluff to the end of the strip, a distance of about half a mile. In character this rookery resembles Zapadni Reef, having a similar boulder beach rising to a crest from 11 to 13 ft. above high water and sloping back to a level strip behind.

6- Garbatch: № 2276 This rookery begins at the Southern extremity of the Zolotoi Sands and extends Southwesterly along the Northwest shore of the Reef Peninsula, for a distance of about 1200 meters. For the first 450 meters of this distance the breeding grounds of

the rookery occupies a rocky beach at the base of a cliff ranging from about 20 ft. to 40 ft. in height, known as Zolotoi Bluffs. Beyond the Bluffs the shore rises in a moderate slope and near the water's edge consists of rocky ledges and loose boulders. At the Southwest end of the rookery, back from the ledges and rocks, is a moderate cinder slope leading up to what is known as the "Parade Ground."

7 - Ardiguen: No 2276 This rookery lies to the Westward of Gorbatch and to the North and East of the extreme point of the Reef peninsula. Some 160 Meters from Reef Point there is a break in the bluff which extends along this part of the shore by means of which the seals can gain access to the bank above. This break has been named "The Slide". The terri-

Bay of Ardiguen embraces the rocky beach beneath the bluff, "the slide", and also some ground at the head of "the slide". Its precise outline and limits cannot be given by the writer from lack of definite information. The rookery had in former years no separate existence, but was considered as part of the Reef rookery. It was isolated and named by the present Seal Commission.

8- Sea Lion Rock. This little islet South of Reef Point at a distance of about a quarter of a mile is occupied by seals during the season.

9- Reef. N° 2276 From the extremity of the peninsula this rookery extends along the Southern shore and then Northeastward to the beginning of the bluff that corresponds on the South shore to the

Zolotoi Bluffs of the North shore, a distance of about 100 meters. The rookery ground slopes very gently up from the water's edge, and is mostly covered with loose boulders. Rocky ledges occur at a few points. The ponds formerly existing about midway of the rookery have been drained.

No. 2280

10. - Kitovi: Beginning at a point about 200 meters Northwest of Kitovi Point and extending around this point to Lukanin Point is Kitovi rookery. Its shore line has an extent of about 850 meters. In the vicinity of Kitovi Point, back from the rocky ledges forming it, the rookery ground resembles that of the greater number of rookeries on the island, being covered with loose boulders; but the greater part of the remainder of the rookery is made

up of rocky ledges "faulted" in many places, thus producing little cliffs and shelves ranging in height from 2 ft. to 20 ft. In this respect this rookery is unlike any other on the island. Except in the neighborhood of Kitori Point the rookery occupies merely a narrow strip along the shore.

11. Lukanin: No. 2280 Adjoins Kitori on the North and extends a distance of about 500 metres to the commencement of the sandy beach forming the shores of Lukanin Bay. At the Southern end the rookery extends well up the steep slope of Lukanin Hill, among large loose boulders. Beginning a couple of hundred metres North from Lukanin Point and extending for about a hundred metres parallel with the shore line and back about 20 metres from it is a series

of low eroded bluffs from 10 ft. to 20 ft. in height. Beyond these the rookery ground again widens out and covers nearly all the East slope of the hill, the ground being covered with loose boulders.

12- Polonina: (No 2283) This rookery begins about 200 Meters West of Polonina Point and extends around the Point Northeastward for a distance of nearly 1600 meters. The main part of the rookery is, however, in the immediate vicinity of Polonina Point and extends only about 200 meters beyond it. The remainder has been designated as Polonina Cliffs, and will be described below. At the N.W. end of Polonina and back from the sandy beach is a mixed sandy and rocky hauling ground about 30 meters in extent. Then comes the breeding ground. The slope of the rookery is gentle, except in the immediate

vicinity of the point where a rocky cliff rises abruptly to height of between 10 ft and 20 ft. Along the edge of this cliff the ledge outcrops, but the remaining surface of the rocky ground is mostly covered with small boulders.

Polonia Cliffs: This is the northern continuation of the Polonia rookery. It consists, as its name implies, of a line of cliffs. Along most of their extent the cliffs consist of an eroded bank above sloping down to an outcropping ledge of rock, which in places is comparatively flat and smooth and in others extremely rough and irregular. The outer edge of this ledge is in general a bluff descent to high water mark. In some places, however, a rocky beach lies below the bluff. At intervals along the bluff are low places and breaks, which furnish runways by means of which the seals gain access to the ledges and

top of the bank. The number of seals frequenting the cliffs is comparatively insignificant.

14- Little Polovnia: No. 2283 This rookery lies to the Northeast of Polovnia Cliffs and has a shore line of about 275 metres. The Southern portion of the rookery has a rocky bluff shore line ranging from 10ft. to 30ft. in height. The elevation of the bluff diminishes as one goes North. Near the middle of the rookery a little cove exists, and a break in the bluff furnishes a runway for the seals. The rocky point forming the North shore of the cove is terraced in steps so that the seals can also gain the bank at this place. Back from the ledges forming the immediate shore line the rookery ground is smooth earth partly covered with small to medium sized boulders.

№ 2285

15- Mojavi:- Beginning at the first rocky point South & West of Sea Lion Neck this rookery extends along the shore line to Northeast Point, a distance of about 2000 metres. Not all of this extent of shore line is, however, occupied by the seals. At the extremity of Sea Lion Neck is a sea lion rookery from which the point derives its name; the sandy beach South of this neck is not suitable for breeding ground; and further along towards the end of the rookery two rocky points are favorite resorts of the sea lions. The great body of seals occupying the rookery is massed on the slope of the slight ridge to the South of the sandy beach above mentioned.

№ 2284

16- Yankichini: Beginning at Northeast Point this rookery extends Westward and Southwest

around Hutchinson's Heil to the sands forming the North shore of the island, a distance along the shore line of about 3000 metres. Practically the whole extent is rookery ground, though the breeding ground is interrupted here and there by hauling grounds, and sea lions occupy a small portion of the shore. Close to Northeast Point at the beginning of the rookery is a short strip of beach where the sea lions breed, and the rocky ledge and reef on the Northwest tip of Visitachini is another resort to which their title is undisputed by the seals. The great mass of the seals of this rookery occupy the shore line and North and West slopes of Hutchinson's Heil. On the North slope especially the rookery ground reaches nearly to the summit of the Hill, and is densely crowded.

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