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Form 504

U. S. COAST AND GEODETIC SURVEY

DEPARTMENT OF COMMERCE

DESCRIPTIVE REPORT

Type of Survey Topographic

Field No. 2270 to Office No. 2274 2287a&b

LOCALITY

State

General locality Pribilof Islands

Locality Bering Sea

~~1897~~

~~194~~

CHIEF OF PARTY

Will Ward Duffield

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U.S. Coast and Geodetic Survey.
FEB 11 1898
Library and Archives.

U. S. COAST AND GEODETIC SURVEY.

, Superintendent.

State: *Alaska*

DESCRIPTIVE REPORT.

Topographic Sheets Nos. *2270–2274, 2287a+b.*

LOCALITY:

Pribilof Islands, Bering Sea.

1897.

CHIEF OF PARTY:

Will Ward Duffield.

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U. S. COAST AND GEODETIC SURVEY.

Henry S. Pritchett, Superintendent.

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State: Alaska

DESCRIPTIVE REPORT.

Topographic *Sheet No.* 2270

LOCALITY:

Staraya-Artil and Little East Rookeries, St. George Island.

(See season's report of 1897)

1897.

CHIEF OF PARTY:

W.W.Duffield

U. S. Coast and Geodetic Survey
FEB 10 1908
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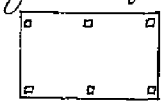
Descriptive report to accompany topographical sheets of St. George Island, Bering Sea. (Sheets No. 2287 a and No. 2287 b) and topographical sheets of six of the seal rookeries on the Pribilof Islands. (Nos 2270 to 2274).

General sheets of St. George Island (Nos 2287a and 2287b).

When the work on this island was commenced it was not supposed that it could be completed before it would be necessary to leave the island; in order therefore to accomplish as much as possible in the time available the work was based on a plane table triangulation starting from a base about $1\frac{3}{4}$ miles long measured with a steel tape, and running west south-west from near the village. At the close of the season, the time being available, a theodolite triangulation was carried out, using the same base and signals as in the plane table triangulation.

At the time the base line distance was plotted on the sheet 10 000 metre distances were laid off around its edge as shown by the pricked holes surrounded by lead pencil squares, the



distances between these holes being laid off to scale both horizontally and vertically. The projection was placed on this sheet at the office in Jan. 1898, and is based on the geographical positions computed from the triangulation. The nearest minutes of latitude and longitude were laid off from each triangulation point, correcting the scale in each direction according to the distances on the sheet as compared with distance given by the triangulation. At the time of drawing the projection Jan. 6, 1898, there had been a general contraction of the sheet of about the $\frac{1}{217}$th part, uniform in all directions, as shown by the 10 000 metre distances all measuring about 9954 metres, both horizontally and vertically. There is some additional distortion due to differences between the plane table and theodolite triangulations. In drawing the projection the lines were slightly bent where necessary to conform to the positions of the triangulation points. The celluloid sheet was used for this island

to save time in foggy and misty weather.

The topography of the interior of the island, east of a line running from Cascade Point to South Hill, thence to the cairn north of Tavarushka Lake, thence north to the shore, excepting a strip near the bluff line and the summits of the hills, was done by Assistant Morse on a separate sheet, the positions of the signals having been transferred from the plane table triangulation. This is filed as an original sheet (No. 2287b) but has not been inked in, as all the work on it has been transferred and inked on the general sheet. The portions of the shore line and adjacent interior covered by the sheets of the seal rookeries (Nos 2270 to 2274 on a scale of $\frac{1}{2000}$) were left blank on the general sheet during the field work, but have been reduced and transferred to the general sheet (Dec. 1897). Two or more points in common for each rookery were located on the general and the rookery sheets, and the reduction and transfer were based on these points. On the general sheet each of the common points is indicated by a small circle, and one point on each rookery is designated by a letter both on the general and corresponding rookery sheets, as follows: A on Staraya Artil Rookery, B on North Rookery, C on Little East Rookery, D at junction of Little East and East Rookeries, E on East Rookery, F on Zapadni Rookery.

All the points permanently marked and described as triangulation points in the volume "Measurement of Base Line and Descriptions of Stations," are shown on this sheet as triangulation stations (△). Several of these stations were not used in the theodolite triangulation. Nearly all of the rock cairns, mostly built by the natives and forming prominent land marks, are represented on this sheet by small circles and are designated cairns. The houses marked "Barrabora" at Zapadni, Garden Cove and East Rookery, are native sod houses. The trails running from the village to Zapadni, Garden Cove, and East Rookery are merely foot paths, on portions of which some work has been done.

The great central ridges of the island, extending from

Bull Hill to near Zapadni Rookery, and from Ellakiya to the base of High Bluff, and the ridge running obliquely across the western end of the island, and the extensive slope south of Ellakiya, are mostly covered with broken volcanic rock, scoria and cinders, intermingled with growths of moss, short grass and wild flowers. The hill summits are usually covered with scoria and cinders and the lower slopes with larger lava rocks, often quite smooth and flat; but angular and jagged and piled in great masses at the terminals of the ancient lava flows which are quite prominent in places. The bordering portion of the island is almost everywhere covered with a heavy growth of course grass becoming 3 to 4 feet high in places, intermingled with wild flowers. The High Bluff (Eganuta) is thus covered on the land side to its summit. There are some boggy areas on the island, especially in the vicinity of the village and of Zapadni; these are moss bogs, spungy and wet, but could usually be traversed at the season of this work; probably in wetter seasons there would be more difficulty in crossing them. At the time of this work (an unusually dry season) there were no running streams on the island save the outlet of the lake northeast of Red Bluffs, and the outlet of the marsh immediately west of the village. Several other well marked stream beds, in which water was seen running after rains, are shown on the map. The stream at Cascade Point was dry nearly all the time. It is said that the cascade here is only prominent during the spring thaws. One of the most striking features of this island is the bold bluff line, from a few feet to 1012 feet in elevation, extending around the island, with short breaks at Garden Cove and Zapadni, and at intervals along the north shore between Staraya Artil and East Rookeries. The High Bluff (Eganuta) extending for several miles west from Staraya Artil Rookery, presents some fine views, and is a prominent land mark from a considerable distance at sea, being plainly visible from St. Paul Island on a clear day. Fox Castle near the western extremity of the island, is a group of ledges of rock somewhat crater like in shape, rising abruptly from

the summit of a knoll. Although the entire island is of volcanic origin there are no clearly defined craters as on St. Paul and Otter Islands. On the shore west of High Bluff and northeast of Fox Castle is a remarkable crag called by the natives the "Eunyak", standing well out from the bluff and rising 471 feet above the water.

The limit of breakers as seen from the shore, and as indicating the presence of reefs, is shown by the dotted lines off Little East and East Rookeries, and the south end of Zapadni Rookery. Only a few rocks off the shore could be discerned, principally in the vicinity of Garden Cove. The greater part of the island is surrounded by kelp growing near the shore, as shown. The only sand beaches are at Garden Cove and at Zapadni Salt House, with shingle beaches at several points on the north shore. For a good share of the bluff line it is impossible or dangerous to descend from the plateau to the shore. From Staraya Artil to Galnoi Point and around to Rush Point there is only one place at which the shore can be reached, at Esogemunga just southeast of Fox Castle; here the natives are said to go up and down to the shore. There is apparently no point at which the shore can be reached from above between Garden Cove and Zapadni.

There is no harbor about the island, and vessels anchor off the village on the north shore, or off Garden Cove, or off Zapadni, according to the direction of the wind. The main landing near the village is somewhat protected by a ledge of rocks running out north of it, and by kelp growing in the bight, the kelp tending to subdue the breakers. A small pocket has been blasted out in the rocks for small boats to come in at high or medium tide. At East Landing just northeast of the village is another boat landing better protected from northwesterly winds, where a similar pocket has been blasted out. A ledge of rocks awash lies but a short distance off this landing. With northerly winds landings may usually be made at Garden Cove on the sand beach, or at Zapadni in the bight at the north end of the

rookery. From these points trails lead across the island to the village, the distance from Garden Cove being about 2½ miles, and from Zapadni about 5¼ miles. Both trails pass over ridges from 400 to 500 feet in elevation and the walking is rather rough.

The following elevations above mean high water were determined with the plane table and were in general checked from two or more sources. On an average they are probably in error not more than a foot.

	Elevations in feet	
	Triangulation station at ground	Summit of hill
Gull Hill	509	509
First Bluff (back of Staraya Artil)	568	570
East Base	119	—
Northeast	119	—
South Hill	668	668
Red Bluff	391	393
Cascade	351 ?	353 ?
Garden	434	—
South Sealion Hill	679	679
North Sealion Hill	645	645
Agisogh (Staraya Bluff)	428	—
Fox Castle	671	671
High Bluff (Eganuta)	1008	1012
Northwest	805	843
Zapadni Bluff	290	—
Guayuard's Hill	380	380
Southwest Bluff	86	—
West Base	237	—
Ulakiya	944	946
Tolstoi	185	—

The field work on these sheets was executed between Aug. 11 and Sept. 25, 1899, by the party under charge of Assistant Will Ward Duffield. The theodolite triangulation, eastern part of interior topography and astronomical observations at the base station,

(Unalaska) were made by Assistant Fremont Morse, and the base measurement, plane table triangulation, shore line topography, western part of interior topography, topography of the five seal rookeries, astronomical and magnetic observations (at St. George) were by the writer.

Topographical sheets of the seal rookeries.

This memorandum relates to the following sheets:

Sheet No. 2270 Staraya Artil Rookery and Little East Rookery, St. George Island, (celluloid)
" " 2271 Zapadni Rookery, St. George Island (celluloid)
" " 2272 North Rookery, " " " "
" " 2273 East Rookery, " " " "
" " 2274 Tolstoi Rookery, St. Paul Island (paper).

The scale of each of these was $\frac{1}{2000}$. A base line was measured with steel tape on each rookery, and a plane table triangulation carried from this base for the control of the sheet. Elevations (above mean high water) were determined with the plane table and checked at different points. The lengths of the bases were as follows (each measured twice):-

Tolstoi Rookery	544.00 metres
East Rookery	210.00 "
North Rookery	462.15 "
Staraya Artil Rookery	130.38 "
Little East Rookery	125.42 "
Zapadni Rookery	187.34 "

No projections nor other distances save these bases, were plotted on the sheets, except the East Rookery sheet, on which 1000 metre distances were laid off along the edge and transversely. Measurements at Washington in Dec. 1897 showed a fairly uniform linear shrinkage of about $\frac{1}{300}$th part, on all these sheets, both paper and celluloid. Points in common on the rookery sheets and the St. George general sheet (as already referred to) are designated by letters. The meridian lines through these points on the rookery sheets, are derived from

azimuths measured from the general sheet. The contours are at ten foot intervals, above mean high water. Prominent rocks at intervals along each rookery were numbered with white paint, as landmarks, and are located on the sheets. The limits of the area occupied by the seals could not be shown on the sheets as these surveys could not be made during the breeding season. For the St. George rookeries and hauling grounds some idea of the area covered by the seals during and after the breeding season, is given by the area of trampled grass which is shown. It must be understood however that the seals wander farther back from the water after the breeding season, and also that some of these areas are simply hauling grounds for the bachelor seals. On Croatt Rookery each end of the rookery proper was marked by painting a rock entirely white, and these terminal rocks are shown on the sheet. The vegetation shows evidence of the seals having in former times extended far back beyond the present area of the rookeries; the so-called seal grass, where the seals have once been, and late in the summer this vegetation has a yellowish tinge in contrast to the more green vegetation further back. The limits of this area were rather too indefinite however to attempt to show on the topographical sheets.

G. R. Putnam

Feb. 3, 1898.

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