

*THE NEW BOGOSLOFF VOLCANO IN
BERING SEA.*¹

On Tebenkoff's chart of Unalashka Island, and the adjacent passes from Unimak to Umnak Islands, there is placed in latitude $53^{\circ} 51'$ north, and longitude $167^{\circ} 40'$ west, an islet about half a mile in extent, with rocky, bold shores, and somewhat flattened top. It has deep water close around it, and no outlying dangers except to the north-north-west, where a small 'pinnacle rock,' or 'sail rock,' lies a few hundred yards distant.

The rocky islet is known as 'Bogosloff.' In his account of his voyages,² Cook says, that on the 29th of October, 1778, he discovered 'an elevated rock which appeared like a tower;' and he judged of its steepness below the surface of the sea by the circumstance that the sea (which was running very high) broke nowhere but against its sides.

I have plotted Cook's position with regard to this discovery, made when he was only four leagues to the south-westward of the islet, and was steering a north-easterly course. From his language, I cannot decide whether he passed on its northern or southern side.

His footnote says, that, though this mass had no place on the Russian map produced by Ismyloff,³ it was indicated on the chart of Krenitzen and Levasheff. Cook placed it about seventeen miles north of the northern shore of the island of Umnak. His longitudes are all too great by more than a degree, but the relation of the islet to the adjacent islands fixes its position.

This reference to Cook's position is somewhat important; because, on an admiralty chart of Bering Sea and the Arctic Ocean (1859), and on a U. S. chart corrected to 1868 (Exploring expedition under Commander John Rodgers, U. S. N.), this islet is called the 'Bogosloff volcano;' and the statement is made that it rose in 1796,—eighteen years after Cook had described it.

Tebenkoff, in 1848 (perhaps following Saricheff in 1829), calls it 'St. John the theologian Island,' or, rather, 'rock,' and gives it a circumference of two miles. According to Saricheff, its height is about four hundred feet; but the navigators of the Russian-American company made it six hundred and twenty feet. Tebenkoff says Pillar Rock lies four hundred yards north-north-west of Bogosloff Island.

On the admiralty chart and on some of the Russian charts (including those of Saricheff), and even on the chart published by the U. S. hydrographic office in 1855, a dangerous reef is laid down between Bogosloff and the northern end of Umnak. The U. S. chart, corrected to 1868, repeats this danger; and it is even laid down on the U. S. circumpolar chart of 1882. Tebenkoff says this 'dangerous reef' does not exist: Veniaminoff says the natives deny the existence of the reef, but report great current or tide rips, which are dangerous to their bidarkas. In 1867 I had the same information from the Russian priest, Shayesnikoff, —a man of more than ordinary knowledge and capacity, and well acquainted with the islands, which he visited regularly in the course of his ministrations: also the Alaska commercial company's navigators have passed between Umnak and Bogosloff islands. Neither the Bogosloff, the reef, nor the northern part of Umnak, is on Kotzebue's chart of 1817.

The height of this volcanic island varies according to the authority from which the estimate has been obtained, as already indicated. Tebenkoff gives estimates, from two authorities, of four hundred and six hundred feet. On my chart I have a note stating the height to be eight hundred and forty-four feet, but I had forgotten to state the authority for that estimate. I suppose that I obtained it from one of the Russian navigators, in 1867. The captains employed by the Alaska commercial company, however, estimate the height at from two hundred and fifty to three hundred and fifty feet.

Of this islet I collate the following facts, without examining many authorities:—

1778.—Cook saw it, Oct. 29, in clear weather. He says it is on the charts of Krenitzen and Levasheff.

1796.—Veniaminoff, calling it 'St. John the theologian,' states that it arose out of the sea on May 7 of this year; and that, at the time, there were, according to Krusenstern and Langsdorff, earthquakes and eruptions.

1800.—It was smoking (Kotzebue).

1802.—It was smoking (Langsdorff). (At that time the volcano Makushin was throwing out volumes of smoke and fire.)

1804.—It was smoking from one crater (Kotzebue).

1806.—The burning lava was flowing down the north side (Langsdorff).

1814.—The crater threw out stones (Baranoff).

1815.—It was diminishing in height (Baranoff).

¹ Communicated by Prof. J. E. Hilgard, superintendent U. S. coast and geodetic survey. See also *Science*, No. 51.

² Vol. ii. p. 528. Third admiralty edition.

³ Ismyloff was the principal trader at Unalashka, and had produced charts of several of the islands, etc., with which he was personally familiar, and showed them to Cook.

1816-17. — It had no activity (Eschscholtz).

1820. — It was smoking (Dr. Stein).

1823. — It was not smoking (Veniaminoff).

1832. — There was no smoke (Tebenkoff, Lütke).

Although frequently seen in later years by the navigators of the Russian-American and Alaska commercial companies, and by the whalers, no one has noticed it as exhibiting any signs of activity.

In an other part of Veniaminoff's work, in giving more particulars of earthquakes and volcanoes, he writes, —

"The new island, Bogosloff, in latitude $53^{\circ} 58'$ north,¹ and longitude $168^{\circ} 5'$ west, rose from the sea in the early part of May, 1796. Before the island appeared above the sea, there had been witnessed, for a long time in that spot, a column of smoke. On the 8th of May, after a strong subterranean noise, with the wind fresh from the north-west, the new small, black islet became visible through the fog; and from the summit great flames shot forth. At the same time there was a great earthquake in the mountains on the north-west part of Umnak Island, accompanied by a great noise like the cannonading of heavy guns; and the next day the flames and the earthquake continued. The flames and smoke were seen for a long time. Many masses of pumice-stone were ejected on the first appearance of the island."

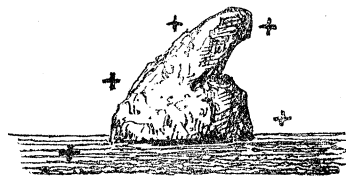
At that time it was, perhaps, only one-quarter the size of its present dimensions; and it increased in size, growing higher, and breaking down at the same time on all sides. Finally, about 1823, it seemed to become unchangeable. Until it ceased to increase in size, it was hot, as well as the sea-water around it; while smoke and steam arose from it continuously.

It is noticeable, also, in this connection, that Krenitzen and Levasheff, who made the voyage of discovery in 1768 and 1769 to endeavor to discover the track of Bering's voyage, have marked Bogosloff on their chart as situated forty miles west by south of Makushin volcano, and surrounded by sunken rocks. Their mark is a view (see sketch), and clearly indicates the peculiar shape of the islet at that time. Their course led them ten miles to the northward of it. So much for the older authorities.

Along the whole chain of the Aleutian Islands, from abreast of the Kamtchatka peninsula to the head of the peninsula of Alaska, there is a line of the greatest volcanic activity exhibited by about fifty volcanoes, of which many are living, and of which some are at times in a state of violent eruption. Some of them have an extreme elevation of about twelve thousand feet on the Alaska peninsula; while the Aleutian volcanoes range from three thousand to nine thousand feet.

¹ This latitude agrees with Cook's.

Of these living volcanoes, one is that of Makushin, on the north-western part of the large island of Unalashka, and directly overlooking Captain's Harbor, on the north side of that island; and another is the islet of Bogosloff, now under discussion, situated twenty-five miles to the westward of the north-western point of Unalashka. This islet has acquired unusual importance, because there has arisen alongside of it, from the depths of the ocean, a volcanic island over one thousand feet high. This fact also suggests inquiries into the condition of the island seen by Cook as 'an elevated rock which appeared like a tower,' and its condition in May, 1796, when it seems to have exhibited unusual signs of activity. Also it appeared, as before mentioned, to have increased in size, and continued so to do as late as 1823. It is possible that Cook saw the rock when in a state of inaction, as he made it out at a distance of four leagues, when working to the eastward under the northern shore of Unalashka; and the weather must have been clear. I conjecture that he sailed between it and Unalashka to save getting too far to leeward; and he must have had it in sight for several hours.



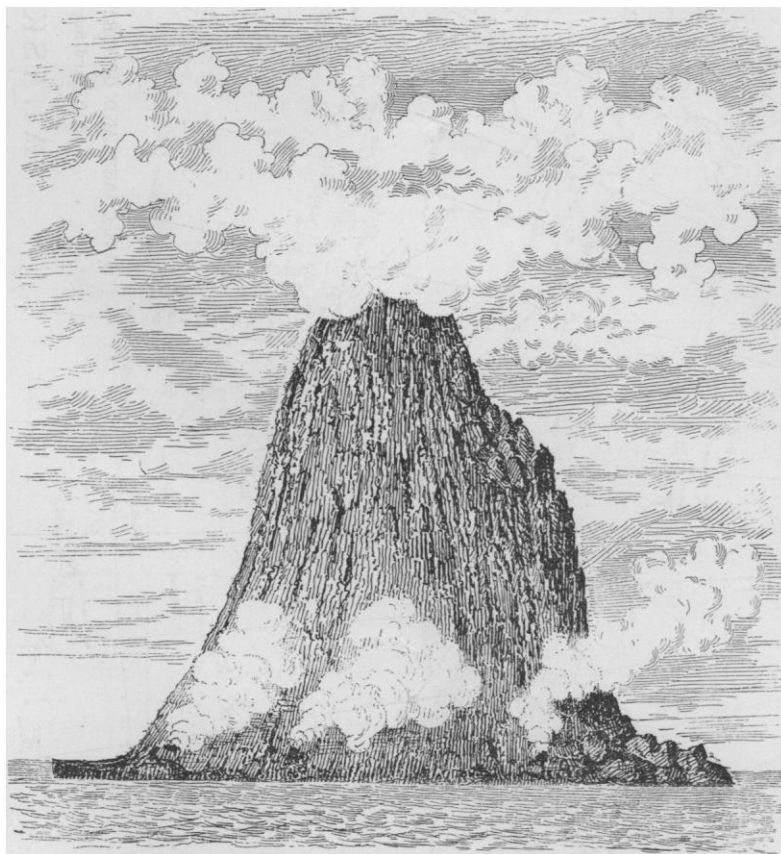
BOGOSLOFF ISLAND, DISTANT TEN MILES, AS SEEN BY KRENITZEN AND LEVASHEFF, 1768-69.

As late as September and October, 1883 (to come down to our own times), the island was seen by two captains in the service of the Alaska commercial company, — Hague and Anderson, — both of whom called upon me, described the character of this new formation, and enabled me to make a rough sketch of the islet as it appeared to them (see view). They both passed close to it, approaching from opposite sides, and thus were enabled to judge of its size, height, and general appearance. Capt. Anderson, in the schooner Matthew Turner, saw the island at daybreak (five A.M.) on the 27th of September, 1883, and passed it at half-past eight A.M. within three cables' lengths; heaving the lead as fast as practicable, with twenty fathoms of line, and finding no bottom, although the water was discolored and of a red color. The vessel first approached it on the eastern side, stood up to the north-westward, tacked ship, and passed to the west-

ward. The islet was surrounded by white smoke, like steam. The same evening, after nightfall, being then about twenty-five miles to windward of it, they saw the fire on the island.

On the 27th of October, 1883, just one month after Anderson's visit, Capt. Hague, of the *Dora*, saw the island at seven A.M., approaching it from the south-westward (just as Cook had done one hundred and five years before). He first passed through a streak of red water into a green streak beyond it (the

Both captains agree in saying that the island is larger than the old one, and is about half a mile north-north-west of it; that it rises very steeply, with a rough, ogee curve; and that the outline on the eastern side is broken on the shoulder and at the base by masses of rocks (see view, below). On the western side there is a level space just above water, and thirty or forty feet in extent, where a landing could be effected. The top was hidden by clouds; but white smoke or steam could be seen issuing



THE NEW VOLCANIC ISLAND OF BOGOSLOFF, AS SEEN SEPTEMBER-OCTOBER, 1883.

water under both conditions having the appearance of being very deep), but, fearing shoals, tacked ship to avoid a nearer approach. He came no nearer than about one mile, and had the island in sight about three hours. At that time there was black smoke issuing from it, as if tar were burning. The weather was cloudy, and no observations could be had for position; but its proximity to the old Bogosloff fixes it with equal precision.

from near the cloud-line, which was estimated to be from eight hundred to twelve hundred feet above the sea. The sides are very steep; and, apparently, it has arisen from the depths without developing outlying dangers, because, with a heavy swell running, no breakers were seen. Around the base are great steam-jets, somewhat like those near the summit. At night it looks as if the whole islet were in active eruption, and covered with fire (this

may arise from the ignition of gases escaping from innumerable apertures in the flanks of the islet).

Tebenkoff, in his description, tabulates this islet as in latitude $53^{\circ} 52'$ north, and longitude $167^{\circ} 39'$ west.

I have no doubt that during the present year (1884) we shall obtain its exact geographical position, its physical conditions, and reliable measures of its size and height.

On the 20th of October, 1883, — seven days before Hagne saw the island, — a shower of ashes took place, small quantities of which were collected at Iliuliuk, and a portion presented to the California academy of sciences. There seems some doubt, however, as to the point whence the ashes came; as the account from Iliuliuk places the date of their fall at Oct. 16, *wind being fresh from west-south-west*, with rain and sleet. It may be that this pumice-dust came from the eruption of Mount St. Augustin (see map of Alaska) on Oct. 6, under the influence of an upper current of air from the north-eastward; that mountain lying over seven hundred miles distant in that direction from Unalashka.

It is noticeable, that during the eruption from Bogosloff, or at least about that time, the two volcanoes on Akontan Island (about as far to the east-north-east of Makushin volcano as Bogosloff is to the west by north) ceased to smoke, and showed no signs of activity. These two volcanoes, only three miles apart, are 3,332 and 3,888 feet high respectively. Nothing was heard from Makushin: probably its summit was in the clouds, and might have been active.

As regards the distance to which the ashes from such eruptions are sometimes carried, it may be mentioned, that at the time of the eruption of volcano Iliamna, in March, 1867, the pumice-ashes fell on St. Paul, Kadiak Island, one hundred and sixty-five miles distant.

From the natives of Iliuliuk it was quite recently learned that they had seen smoke issuing from the new Bogosloff — or, rather, from the position of the Bogosloff — some time in 1882: the exact date could not be obtained.

GEORGE DAVIDSON,

Assistant U.S. coast and geodetic survey.

THE DANISH EXPEDITION TO EAST GREENLAND.

THE report of Lieut. Holm has appeared in the *Dagblad* of Copenhagen. He left Nanortalik on the 23d of July last, with a party of thirty-nine

people, nine kayaks, and four umiaks, and reached Fredericksthal, the last European station, the same evening. Here they were assisted and entertained by missionary Broadbeck until the end of July, while the party was detained by the presence of floe-ice in the vicinity of Cape Farewell. From the 31st of July until Sept. 11 the party was not much incommoded by ice, only losing three days while detained in Lindenow Fiord.

The charts of East Greenland as far as latitude 61° , where the work terminated, will be notably changed, especially by the discovery of extensive fiords, until now unknown. Their shores are generally bare and vertical, or nearly so. In many places snow lies all summer. The sea-ice reaches to the bases of the cliffs, or even several miles into the fiords. Except at the extreme south, vegetation is even less abundant than in West Greenland, and is sometimes wholly absent. The southernmost of these fiords, some thirty-eight miles long, reaches within ten miles of the head of the Tasermit Fiord, which opens on the western coast. Both are full of ice. South of the sixty-first degree of latitude, and even a few miles northward from it, nothing could be seen of the inland ice characteristic of West Greenland. In that vicinity, from a mountain peak three thousand feet in height on Iluilek Island, they were able to see that the interior of the country for a great distance was composed of grand mountains, often rising over seven thousand feet above the sea.

In the fiords explored in 1883, there were found no remains of buildings erected by the Northmen, except those in Lindenow Fiord, the most southern of all, already described by Broadbeck. A great number of Eskimo ruins were noted in the different fiords. Sixty of these uncivilized natives were met going to trade with the people of West Greenland. They were much less like the typical Eskimo than those of the western coast. The men are almost always tall and slender, with long beards, and at a distance resemble Europeans. Some of them were even handsome, and the women were much prettier than those of West Greenland. In summer they lead a nomadic life, going from one fishing or hunting place to another. In winter several families unite to build huts covered with turf and stones, like those of West Greenland. They spend this season hunting seal and bears.

When the natives of Holm's party arrived at about latitude 61° , they refused to continue farther, fearing that the umiaks might be frozen in, as the ice began to knit together every night. On the most northern point attained, a hut was erected, and a depot made for the use of the expedition during the coming summer. Provisions and several boats were left here, and Holm returned with his party to Nanortalik. Here winter quarters were prepared, and a magnetic and meteorological observatory established. Magnetic observations are to be taken hourly from eight A.M. to midnight; on term days, every five minutes; and from four A.M. to four P.M., every minute. Arrangements have been made for simultaneous observations at the commercial stations of Denmark, in West Greenland.