

# The Volcano Letter

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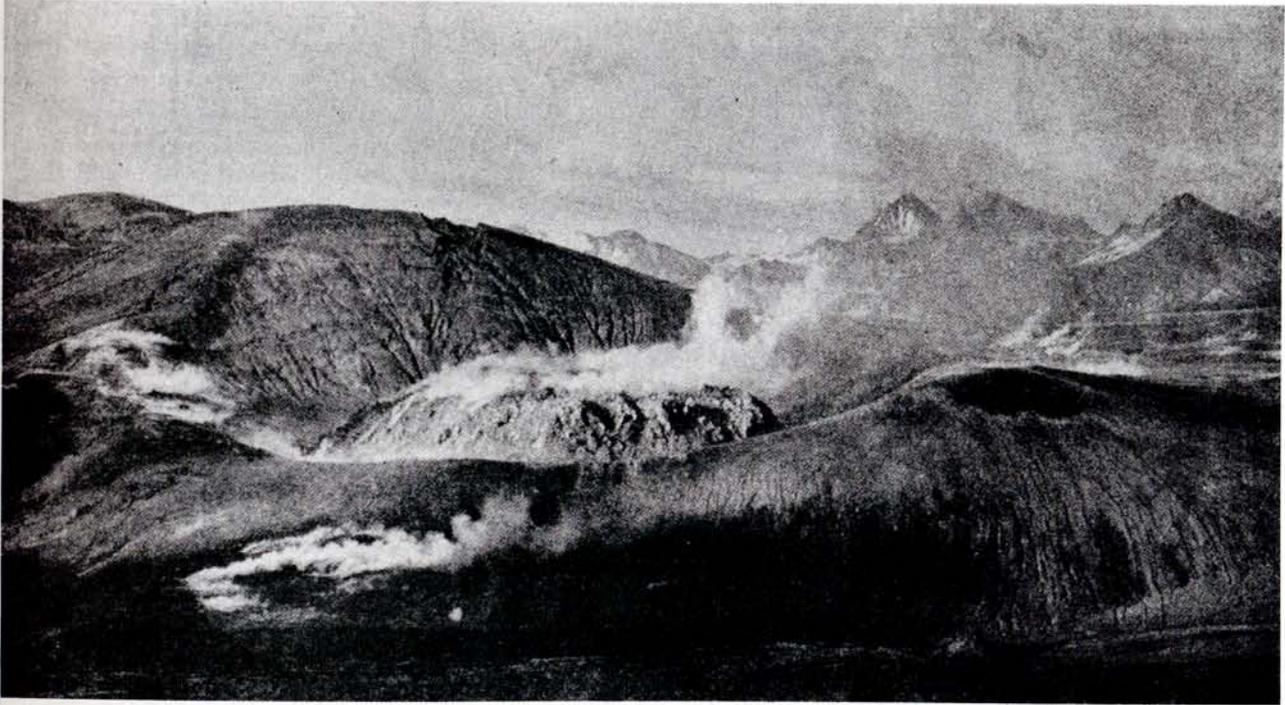
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Hawaiian Volcano Observatory, National Park, Hawaii

October 30, 1930



Novarupta Dome, of siliceous lava, from the southwest, showing parts of the Valley of Ten Thousand Smokes beyond.  
Photo, National Geographic Society, 1919, from Katmai Series, No. 1.

## THE ERUPTION OF KATMAI, ALASKA, 1912

By H. Okimura. Reference: Robert F. Griggs, National Geographic, September 1921, pp. 219-292.

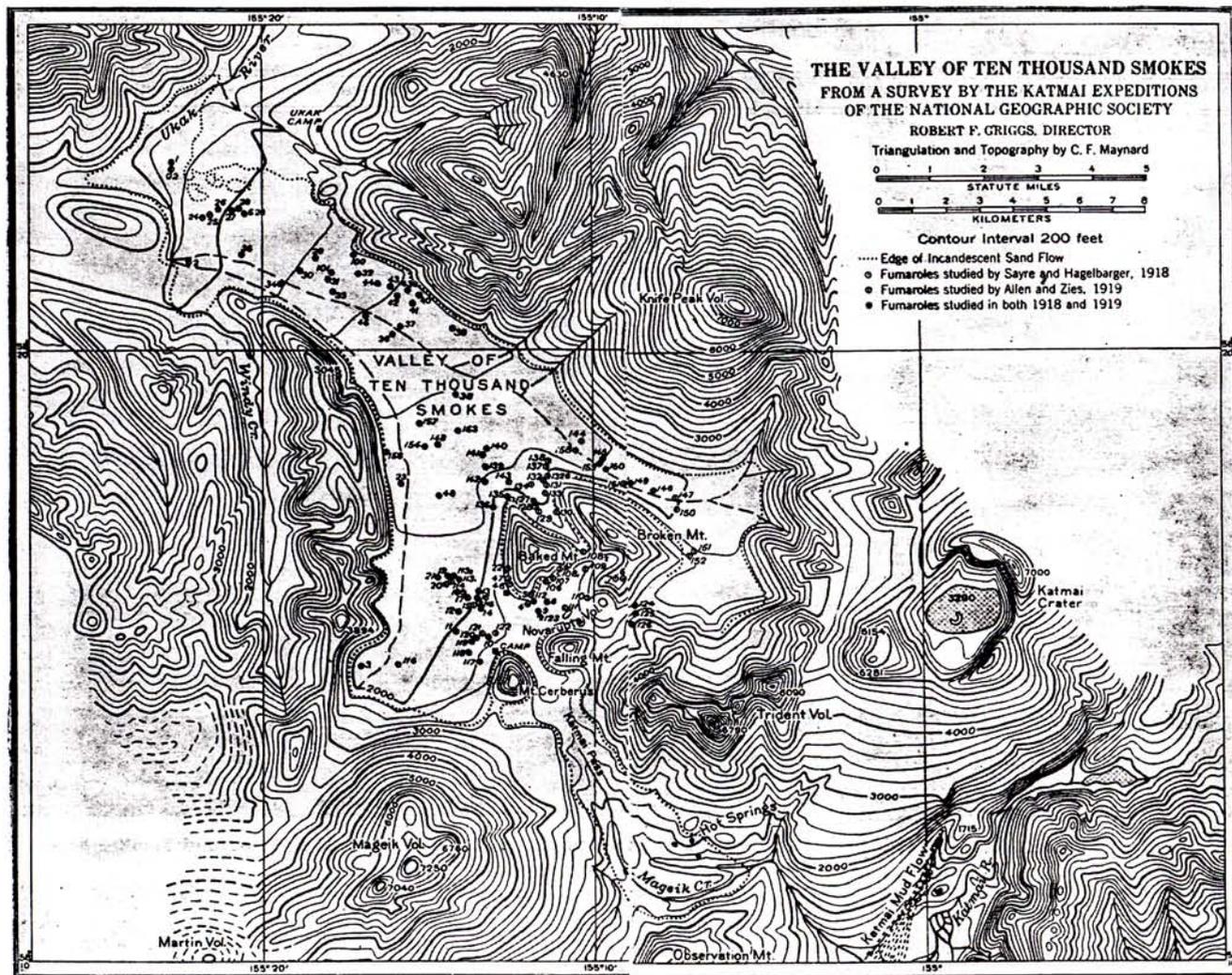
The explosion of Katmai Volcano in Alaska in June 1912 is ranked among the twelve greatest historic eruptions of the world. It is easy to see the justification of giving this rank when it is shown that as a result of this eruption, a town a hundred miles away was buried under a foot of ashes; that so loud were the concussions that the comments of people at a distance of 750 miles were excited; and that the quantity of dust thrown into the upper atmosphere was such that the intensity of the sunlight was diminished for many months throughout the northern hemisphere. The eruption giving rise to the Valley of Ten Thousand Smokes was a sequel to eruptions from the floor of valleys at a considerable distance from Katmai as shown by the fact that the stratified ashes from Katmai everywhere lie on top of the deposits of this earlier phase of eruption.

Lack of any eye-witnesses and any recorded happening resembling this sort of eruption made difficult the interpretation of the events of this great explosion. True, there was one, "American Pete" as he was called, who had witnessed the occurrence but aside from stating that it was dark and hot ashes fell, the only eye-witness could not much enlighten the explorers. The host of small volcanoes or vents which burst forth destroying the once beautiful green valley, presented a feature unusual in volcanic phenomena, for here no dormant vents had awak-

ened, but volcanoes had been formed in areas where none had existed. The new volcanoes, made simply of holes blown through the floor of the valley, began to throw out ash and pumice in enormous quantities soon after their formation.

It is believed that in addition to myriads of fumaroles, hundreds of vents must have been belching forth incandescent material in veritable torrents of fire. Quantities of red-hot solids and liquids, sands and stones, masses of fluid or semi-fluid lava rushed out of the vents and poured out on the ground to roll down the slope and consume everything along its path. It is also believed that had one been able to witness the scene, there would have been seen many separate volcanoes each pouring forth its own mass and giving rise to great black clouds to a considerable height in ever-expanding convolutions. The smoke, instead of deriving its source from the mass of incandescent material around the vent, originated from the gases that boiled out of the semi-molten lava. The quantity of gas given off was so great as to be able to puff up the lava into pumice and entirely disrupt it by the expansive force of escaping gas.

The valley was overgrown to an altitude of 1500 feet by a dense forest and except for the ancient lava flow the rocks of the valley are not volcanic, consisting of sand and shale full of fossils of marine shell-fish of Jurassic age. Long before fires that consumed the surrounding vegetation had time to run their course, the mass of incandescent fragments accumulating round the separate vents coalesced until they covered the whole area of the valley,



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Map showing Katmai crater on the east, Novarupta Dome in the middle, and the pumice-filled Valley at the left. From National Geographic Society, Katmai Series, No 1.

converting it into a single fiery torrent of red-hot sand and rock which began to roll down the valley under gravity for seventeen miles and even at that distance the heat was so intense as to reduce every stick it touched to charcoal. This fiery mass is not comparable to ordinary lava, although undoubtedly a liquid in the beginning, it did not remain so, for the escaping gas converted it to solid fragments suspended by the enormous quantities of gas given off.

The main arm is toward Naknek Lake for seventeen miles while another completely encircles Broken Mountains. The greatest length is twenty miles while the greatest breadth is nine miles, the total area covered being 53 square miles. The magnitude of the operation by which it was produced could be conceived if it is said that the sand flow is equivalent to the output of all the stone crushers in the United States for a period of 100 years.

The highest temperature was 645 degrees Centigrade and a stick thrust into the hole was changed to glowing coal within a few seconds. Big fumaroles furnished any degree of heat that might be needed for cooking, while snowdrifts behind the tents gave water and provided refrigeration. The steam from the fumaroles was highly

charged with either hydrochloric or hydrofluoric acid which ate the rope to pieces and made holes in aluminum pots. Bacon was fried in no time, while corn bread was baked satisfactorily in Nature's oven.

In some places, columns of very hot steam came out under considerable pressure. The emerging gas came with such a rush that when a cup of water was poured over it, the water was vaporized before it had a chance to touch the bottom and a hat thrown in was tossed up thirty inches in the air.

Although the explorers had been able to get a fair idea of the "Smokes" themselves, they had no adequate conception of the marvelous coloration of the valley. One of the men who had lived on the brink of the Grand Canyon was impressed with the striking colors which were altogether different from those of the Canyon. The colors of the Canyon being remarkable at a distance, the coloration is produced entirely by the wonderful atmosphere and brilliant light which floods its recess. The colors of the valley are more brilliant when seen at close range, but at a distance they are grayish or brownish due to the fact that all the colors of the spectrum, being present close together, blend into a neutral color. In some places con-

siderable areas are leached out to a gleaming white by the acid fumes, while in some places pure yellow sulphur overlies other colors, and in still other spots where the ground is not too hot a bright green color is produced by the growing algae.

body of water to a height of four or five feet and occasional jets reach a height of 10 feet.

The Boiling Lake was the lowest during the summer of 1930 that it has been for several years.—R.H.F.

**LASSEN REPORT No. 26**

Lassen Volcano Observatory.

R. H. Finch, Associate Volcanologist.

During the summer of 1930 the National Park Service built a modern fire lookout building on the summit of Mt. Harkness, 8,039 feet above sea level. The United States Geological Survey installed seismographs in the basement of the building on August 21, 1930.

Eighty-eight tremors were recorded during the month that the seismographs were in operation. In addition to these tremors, there were, on many days, more or less slight continuous vibrations with a period of two seconds. This continuous shaking was stronger in the north-south direction than in the east-west. This type of vibration appears to be peculiar to the mountain top.

The entire mountain top is shaken by strong winds and the seismographs show a very irregular record on windy days. Puffs and gusts of wind produce records of tremor with considerable amplitude.

Good records were written of the southern California earthquake of August 30, 1930. The record of the Eureka, Cal., shake of August 23, 1930 was larger than that written by the instruments at Mineral. Several of the shakes that were recorded at Harkness were not recorded at Mineral.

Some time during July, the "Big Steamer" or uppermost large vent in the Supan Solfatara increased in activity and scattered mud for a distance of forty feet around the vent.

What was hitherto a large steam vent in the south-eastern end of the Devil's Kitchen is now a boiling pool about 10 feet across. It boils constantly raising the main

**KILAUEA REPORT No. 979**

WEEK ENDING OCTOBER 26, 1930

Section of Volcanology, U. S. Geological Survey

H. A. Powers, Temporarily in Charge

A few avalanches in Halemaumau occurred simultaneously with the earthquake on Monday morning, October 20, which are thought to have been started by the quake. Since that time, no rock falls of noticeable size have been seen. The steaming of the wall and floor cracks has been very light except for short periods during rains.

The seismographs at the Observatory registered very slight traces of a distant earthquake on October 24. The record started at 9:55 a. m., Hawaiian Standard time. Only two local shocks were recorded during the week, the one moderate earthquake at 8:25 a. m. October 20, and one very feeble shock at 6:27 p. m. October 24. Fifty-seven very small tremors registered on the seismographs during the week, and the microseismic trembling of the island increased a moderate amount the later part of the week accompanying the few days of high wind and heavy surf.

During the earthquake of Monday morning, the ground under the Observatory was tilted to the north-northwest (erroneously stated last week as north-northeast). But since the quake, there has been practically no tilting of the ground as registered by the instruments. It would appear that the increasing pressure which caused the northeasterly tilting last week had culminated in the big quake. It will be interesting to see whether the first major change of pressure after this temporary standstill will be a decrease or a further increase.



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