THE VOLCANO LETTER

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KILAUEA REPORT NO. 681

WEEK ENDING JANUARY 28, 1925
Issued by the Observatory, U. S. Geological Survey:
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The weather of the week has been fair with variable winds and calms, and one rainy day on the 26th. There are two conspicuous features in Halemaumau pit during the present quiet solfataric spell following the eruption of May, 1924, which change with the weather. One is the efflorescence of white sulphates on the walls after dry sunny weather, increasing the more such weather is prolonged. The other feature is the visibility and apparent density of the vapor jets about the bottom, and of the larger vapor cloud which condenses above the whole pit. In rainy weather the dense vapor of the small jets at the bottom may fill the whole pit and merge with the cloud above that rolls away to leeward. In sunny or cloudy weather this big cloud may be wholly invisible or merely shreds of rapid-rising cumulus high above the pit, and the steam jets on the bottom appear thinner, less flocculent and more idle in their rising activity.

At the beginning of the week after a dry spell the walls were notably white and chalky with magnesium sulphate, especially above the two ends of the hot north sill. On the 26th after a rainy day it was remarkable how these big areas of white stain disappeared.

This whitening is different from the true solfataric action of the live vents about the bottom depositing sulphur and sulphates yellow, cream colored or greenish or even pink, with hot steam making dry patches in the midst of stones dark with moisture roundabout. There are three such deposits at the base of the southeastern wall, eight patches in the talus west, south and east, and two stained areas fuming in the floor. These places are very hot, but they also become inconspicuous in coloring after excessive rains.

The vast pit of Halemaumau shows only gradual changes. Small rock slides have occurred mostly at the north intrusive sill. The peculiar sliding noise reported last week has not recurred, but in morning sunlight on the 25th a depression was detected about 20 feet wide extending N-S across the W side of the floor. The mud drainage was toward this place indicating extreme lowness, and here is the west pocket with salts and hottest and densest steam jets. The peculiar slides may have been into this depression.

The seismographs have recorded 11 local earthquakes, one of these January 26 at 6:42 a. m. showing indicated origin 11 miles from the Observatory, probably to the southeast. Tilting of the ground has been to the south-southwest.

Temperature measurements at vapor cracks from rim of pit outward from Halemaumau gave 162° Fahr. at south rim, 167° west rim, 169° southeast rim, 187° at a purring vent 100 feet back of southwest rim, 189° at road terminus 2000 feet back southeast and 194° at old sulphurous cracks south of Kilauea crater at the contact of lava and gravel. This last place was also blowing. If we go still farther outward to the Sulphur Bank at Volcano House we get 204°. Thus cracks are deeper and hotter the farther we go from the volcanic center.

A VOLCANIC OUTBREAK THAT SHOOK THE GLOBE

World-shaking earthquakes are well known. Sudden release of stress occurs somewhere in the earth, and a big earthquake is registered on seismographs thousands of miles away. It is commonly thought volcanoes have little to do with it. Many big earthquakes happen under deep oceans for the centers can be located by the seismographs. Of lava outpourings under the deep sea we know nothing; they may very possibly occur.

Dr. Tams of the Hamburg earthquake station (Volcanological Review, 1924, 137) shows that Katmai volcano in Alaska, in June 1912 produced eleven earthquakes which were well registered at St. Petersburg. The actual swing of the ground at the Russian station was from a thousandth to six-tenths of a millimeter. The instrument magnifies the movement and makes it visible as a written zigzag line. The Katmai earthquakes were registered at other stations in Europe, America, Asia and Africa. During the first three days of the tremendous explosions that gave birth to the Valley of Ten Thousand Smokes, two of the shocks were registered at Cape Town 11,000 miles away. Their centers were not right at the volcano, but at places 60 or 90 miles to the west.

All the centers located were notably along belts parallel with the line of volcanoes and 50 to 100 miles away. There were also big shocks in the Mt. McKinley range at the end of the line, and in the deep Aleutian trough of the Pacific.

Many earthquakes were strongly felt in towns near the volcano about the time of the disaster June 6th, 1912. The eruptions continued all summer with loud noises and numerous earthquakes. Dr. Griggs (Nat. Geog. Soc. 1922) and his colleagues estimated that six cubic miles of ash were ejected.

Mt. Katmai lost two cubic miles of rock unaccounted for in the ejecta. A big crater and many cracks remained, two new adjacent craters appeared, and in one of them stood an obsidian dome of new lava 200 feet high and 800 feet across. A fill of hot sand with hundreds of fumaroles occupied a valley representing a zone of fractures crossing the Alaskan peninsula. It was thought that a large body of siliceous lava underlay the peninsula and the earthquakes and eruptions accompanied movements of the earth's crust wherein tension cracks opened. It is a matter of theory as to which was cause and which was effect.

The seismographs of Europe were calibrated by the Sakurajima earthquake of 1914. This in Japan destroyed houses and lives. Registered in St. Petersburg it swung the pendulum four-hundredths of a millimeter. From St. Petersburg Alaska is the same distance away as Japan. Therefore Katmai earthquakes swinging the St. Petersburg pendulum twice as far and fifteen times as far as did the Sakurajima shock, were twice as big and fifteen times as big. In this way the size as well as the location of earthquakes in the Alaskan wilderness, were better determined in a quiet cellar in Russia than they could be by any evidence available in the region where they occurred.

Big earthquakes near volcanoes are not unusual. The Sakurajima eruption was itself a trigger that turned loose the big shock in South Japan. Large earthquakes near Etna in Sicily at times of eruption have been recorded on the seismographs of Europe. And lastly, the big lava flows of Hawaii in 1868 were preceded by an earthquake of the globe-shaking variety which was felt 300 miles from the volcanoes.

T.A.J.