

THE SCIENCE NEWS-LETTER

A Weekly Summary of Current Science

EDITED BY WATSON DAVIS

ISSUED BY
SCIENCE SERVICE

B and 21st Streets
WASHINGTON, D. C.

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SUBSCRIPTION: \$5 A YEAR, POSTPAID

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Vol. V. No. 179

Saturday September 13, 1924

WHY PEACEFUL KILAUEA IS ON THE RAMPAGE

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The Hawaiian volcanoes are popularly supposed to be the most placid in the world but they sometimes belie their reputation. Kilauea volcano on the 18th of May of this year produced an explosive eruption quite comparable to those of Vesuvius.

This was not wholly unforeseen, for we know that natives were killed by a blast from Kilauea 134 years ago. It is known also from Japanese statistics that 130 years is a critical interval between eruptions at many volcanoes, and a suspicion that this might apply to Kilauea led us in 1918 to publish a warning that about 1920 might be a dangerous time.

The warning was abundantly justified. The year 1920 produced tremendous lava flows, for the next four years the lava sank lower and lower within the mountain, and in 1924 the famous fire pit of Kilauea collapsed violently so as to plug the accumulated gases beneath, and a terrible explosion ensued.

We do not yet know the cause of such explosions but there is much evidence from observations made during the last ten years to justify the working hypothesis that the lava sank so low as to let the rain water underground close over the cracks containing the glowing slag. There is everywhere a great sea of underground water in all lands. In Hawaii the rocks are so porous that this water stands inside the island at a very low level, so low that it can not be reached by ordinary wells, but flows out as sea-level springs. Ordinarily the lava column at Kilauea crater must cover itself with a shell of hardened slag in the shaft beneath the volcanic vent, and keep the water out by evaporating it with its heat.

This year, however, there was a swarm of earthquakes in Puna, at the east end of Hawaii. The ground cracked open in huge crevasses, as though a lava flow were going to break out at sea level. The ground, however, subsided. Then the fire pit 3700 feet higher near the summit of the mountain began to cave in, great black clouds of avalanche dust shot upwards, the pit grew bigger and bigger, steam appeared, and then the black clouds growled and roared and hurled out huge broken rocks without a particle of fresh lava. It was just as though the pit had been converted into an upright quarry with big blasts let off at intervals of about six hours. Boulders weighing ten tons were hurled hundreds of feet from the

explosion center. Dust curdled into rain clouds and came down as mud balls. Gutters on the hotel roofs broke down with the weight of rock powder. A man trying to photograph the pit at close range was killed by a barrage of boulders. The eruption lasted two weeks and the great cauldron left was 3500 feet long and 1300 feet deep.

All the other activities of Kilauea have shown fresh black glassy lavas and so do the other Hawaiian volcanoes in most of their eruptions. Until last February the fire pit was full of boiling lava fountains. The succession of events since 1914 has been Outpouring of lava at 13,000 feet above the sea, then 8,000 feet, then 3,000 feet and finally this inpouring at sea level itself. It seems logical to conclude that such explosive eruption is a secondary matter occasioned by the plugging of the vent, the closing in of the underground waters, and the consequent development of enormous steam pressure. The interesting feature of this is that the water explanation accounts, not for ordinary lava activity, but only for the exceptional crises of explosion. Explosive eruption at a lava volcano is a secondary phenomenon, and primary volcanism may be fundamentally dependent on hydrogen and other deep gases.

AMERICA'S FIRST AIR LINER SOON TO CROSS UNITED STATES

The ZR-3, America's first giant, passenger-carrying airship, now being prepared for its trans-oceanic flight from Friedrichshafen, Germany, to Lakehurst, New Jersey, may be sent across the continent soon after its delivery to the United States, according to tentative plans under consideration by the Navy Department. Mooring masts for the accomodation of the big aerial liner have been erected at Forth Worth, Texas, San Diego, California, and Camp Lewis, Washington.

Before starting this more protracted cruise, short trips will probably be made from Lakehurst to determine the exact differences in behavior in the air of the new commercial ship as compared with the Shenandoah.

The new ship is not a sister ship of the American-built Shenandoah, designed in 1916 as a military auxiliary. The ZR-3 is strictly a peace-time air liner with Pullman accomodations for twenty passengers and especially designed in 1921-22 to meet the requirements of greater safety and comfort demanded of a commercial craft. It will be used to test the commercial possibilities of lighter-than-air traffic.

Hydrogen gas will be used by the Germans in their flight across the Atlantic, but the ZR-3 will be converted for the use of helium after it is received by the Navy.

The new ship was built by the experts of the famous Zeppelin Company who have made 125 dirigibles. This is the first ship, however, which was specially designed for its great size. Previous big ships were merely expanded to their mammoth proportions from the designs for smaller ships.

The ZR-3 is larger and speedier than the Shenandoah although not so long. It measures 658 feet in length, whereas the Shenandoah measures 680 feet. Its diameter, however, is 91 feet as compared to 78 feet for the Shenandoah; making it somewhat stockier and giving it a greater gas capacity, 2,400,000 cubic feet as compared to 2,115,000 cubic feet.