

Seismic measurements in Surtsey

by

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At the beginning of 1966 the Physical Laboratory of the University of Iceland obtained a portable seismograph through a grant from the National Science Foundation in Washington. The recorder is a 7 track magnetic tape recorder from the Geotechnical corporation, capable of running unattended for 10 days.

The first run in Surtsey was made on March 17th to 25th with two seismic detectors, one close to the hut where the recorder was operated and the other close to the extinct lavacrater at a distance of 600 m from the hut. In this run the detector at the crater had soon become inoperative because of high temperature in the lava and a broken cable.

A second run was made on April 2nd to 8th with one more seismic detector added in the SE part of the island 1000 m from the hut and 700 m from the crater. One track recorded time signals from the continuously operating Czechoslovak station OMA. Owing to excessive winds and surf during this period both cables to the distant detectors were broken.

A quick inspection of these records, using the one channel playback facilities of the recorder, did not reveal any sudden earthquakes, only tremors which to some extent at least were caused by ocean waves.

During the summer the seismometer was in operation from June 1st to Sept. 25th with only a few interruptions. Three seismic detectors were placed near the hut in the north part of the island, one near the west coast and one in the southeast part of the island. The detectors form a triangle with all sides approximately 900 m. Besides the five tracks used for seismic detectors one track is used for recording time signals from OMA and from a Bulova clock.

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From June 15th to August 28th the seventh track was used to record signals from a pressure sensitive crystal detector placed in the old lavacrater.

On August 19th a new lavaeruption started in the immediate neighborhood of the SE detector. As the detector was threatened by the lava it was moved to a place just north of the new crater. A sixth seismic detector was installed on August 28th about 300 m SSW from the hut.

A quick inspection of the recording made during the period July 24 - August 3 reveals a great number of small earthquakes recorded on all seismometers. It seems possible to locate these earthquakes even as concerns depth of origin. Tremors are also observed.

On August 19th there was a sharp increase in tremors coinciding with the beginning of the eruption in Surtsey itself. Fig. 1 shows the trace from the SE detector, a vertical seismometer only about 100 m from the eruptive fissure. At 6:30 U.T. we have the beginning of a swarm of small earthquakes lasting about one hour. Prior to that no earthquakes are seen for 11 hours. At 7:52 there is a sudden increase in tremor activity due to the beginning eruption. 37 minutes later the signal from this detector suddenly disappears as the lava reaches the electric cable connecting it to the recorder.

A thorough investigation of the magnetic tape records from Surtsey has not yet started due to the lack of adequate play-back equipment in Iceland.

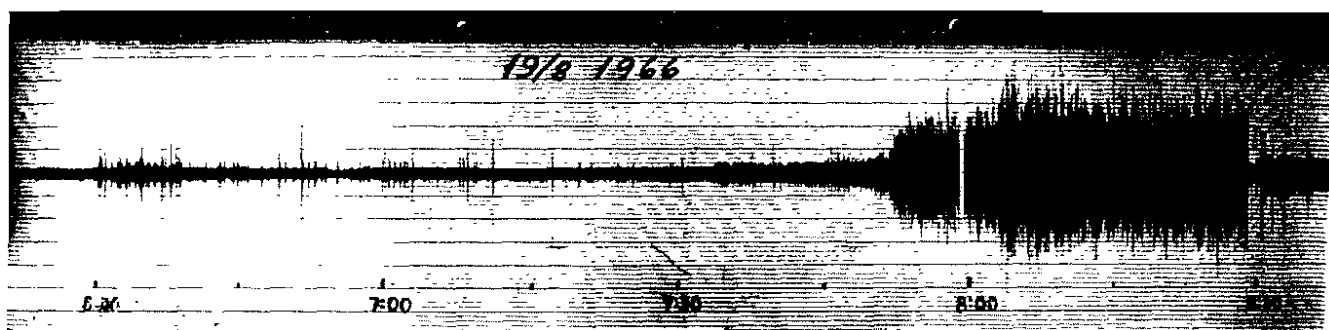


Fig. 1

Seismic activity at the beginning of the eruption
on August 19th, 1966.