

Continued Geomagnetic and Seismic Measurements on Surtsey

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Geomagnetic measurements

Magnetic field measurements were continued at the stations Surtsey I, II and III. Field intensity measurements were carried out with the same proton precession magnetometer as before and the results are listed in Table I. (Field intensity in gammas).

Table I

Station	Date	U.T.	F	F (Leirv.)	ΔF
Surtsey I	1967 July 1	10:24	51328	51042	286
Surtsey I	1968 March 19	16:30	51411	51191	220
Surtsey II	1968 March 19	15:47	51609	51172	437
Surtsey III ¹⁾	1967 July 1	09:30	48767	50982	-2215

1) 1.28 m above ground.

The Horizontal component and declination were measured at Surtsey II with a QHM magnetometer. The results are given in Table II.

Table II

Surtsey II, 1967 July 1, 11:30 U.T.					
H	D	H (Leirv.)	D (Leirv.)	ΔH	ΔD
12953	337°04.4	12124	337°05.1	829	-0.7

Field intensity measurements were also made at Surtsey II on June 30, 1967, but the geomagnetic field was too disturbed for a reliable determination.

The ΔH and ΔD values of Surtsey II measured on July 1 are the same as those measured on Sept. 12, 1964.

Total field intensity, on the other hand, is decreasing at

all stations. Fig. 1 shows ΔF values for Surtsey I and Surtsey II since 1964. The plot for Surtsey I shows that the field is still decreasing and probably will go on decreasing for some years to come. This means that the magnetic anomalies caused by the lava in Surtsey have not yet reached their full strength and will still be increasing for some time.

Fig. 2 is a total field intensity map from the aeromagnetic survey which was carried out from a helicopter on August 31, 1965 at an altitude of 200 m. The readings have been corrected for time variations in the geomagnetic field by using recordings from Leirvogur Geomagnetic Observatory and refer to mean values for the field intensity. The magnetic map shows positive anomaly over the southern part of the island closely related to the basaltic lavapile.

Seismic measurements

The magnetic tape seismometer was operated on Surtsey from July 7th to September 29th with some interruptions. Three detectors were situated at one station near the hut in the northern part of the island, one detector was in the western part of the island and one in the southeastern part. Distance between these stations was about 1 km. Time signals were received from the British station MSF on 60 kHz.

From Oct. 20th, 1967, to March 10, 1968, a single component seismometer was operated on Surtsey connected to a 0.1 W UHF transmitter which transmits the signal over a distance of 20 km to a receiver in the Westman Islands. The battery powered seismometer and transmitter have operated unattended for 10 weeks. From the Westman Islands the frequency modulated signal goes to Reykjavik via a VHF telephone channel which the Icelandic Telephone Authority has put at our disposal for this purpose. In Reykjavik the signal is recorded on a conventional seismic recorder at the seismic observatory operated by the Meteorological Office.

Through the kind invitation of the University of Cambridge, England, we have been able to use their magnetic tape equipment to reproduce on paper the magnetic tape records from 1966. Fil.lic.

Ragnar Stefánsson has conducted the playback reproduction and is engaged in evaluating the result. These records contain a large number of earthquakes which seem to come from a depth of 4-5 km. Periodic tremors are also frequent, and seem to reflect pulsations in the eruptive activity. The investigation of these records has not been completed.

The magnetic tape records from 1967 have not yet been reproduced on paper, but this will soon be done as we are acquiring magnetic tape equipment for this purpose.

The telemetered seismograms only show very weak earthquakes on Surtsey last winter. Some tremors are present, but it is not yet clear if these originate underground or are due to wind and waves.

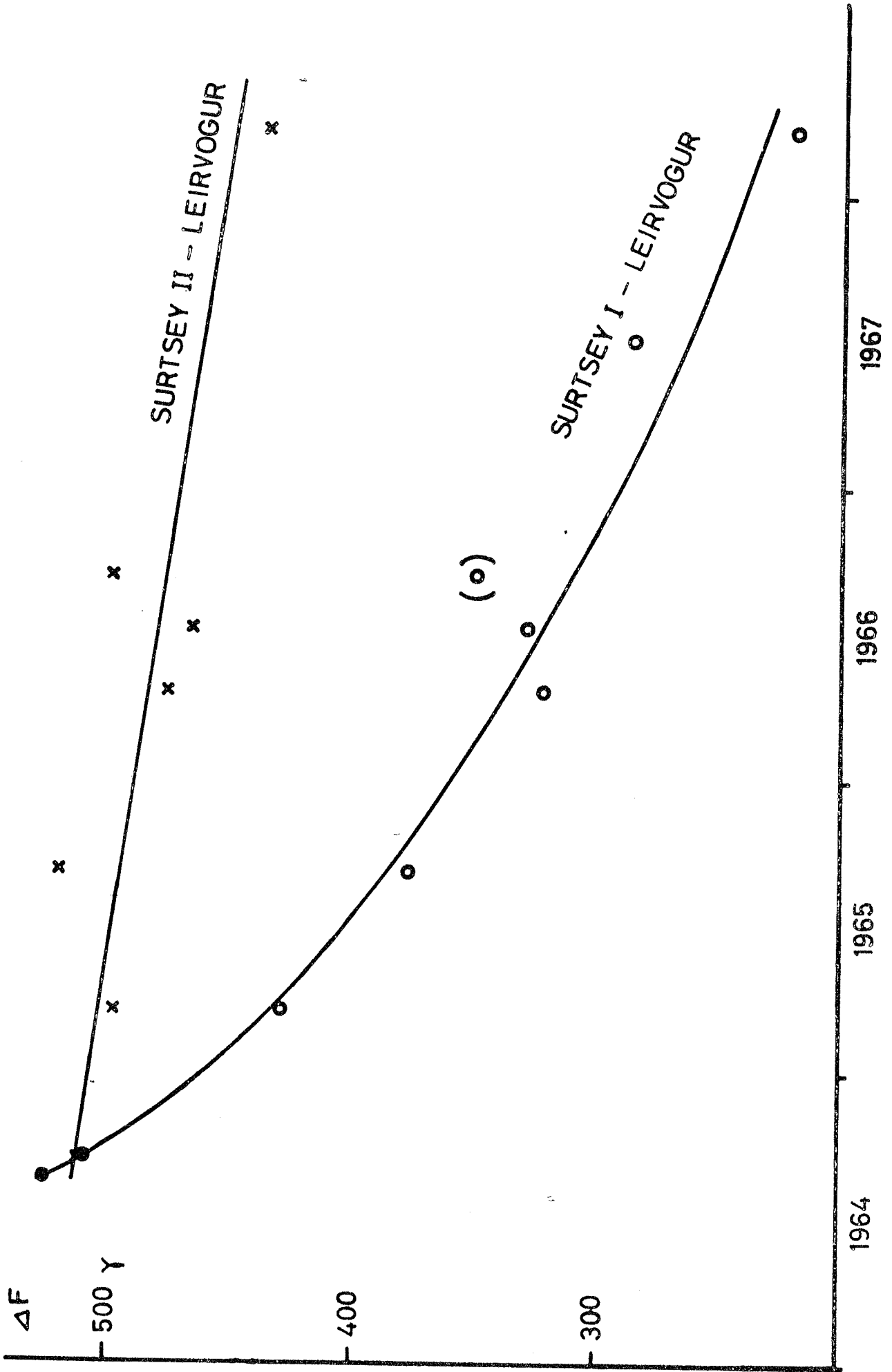
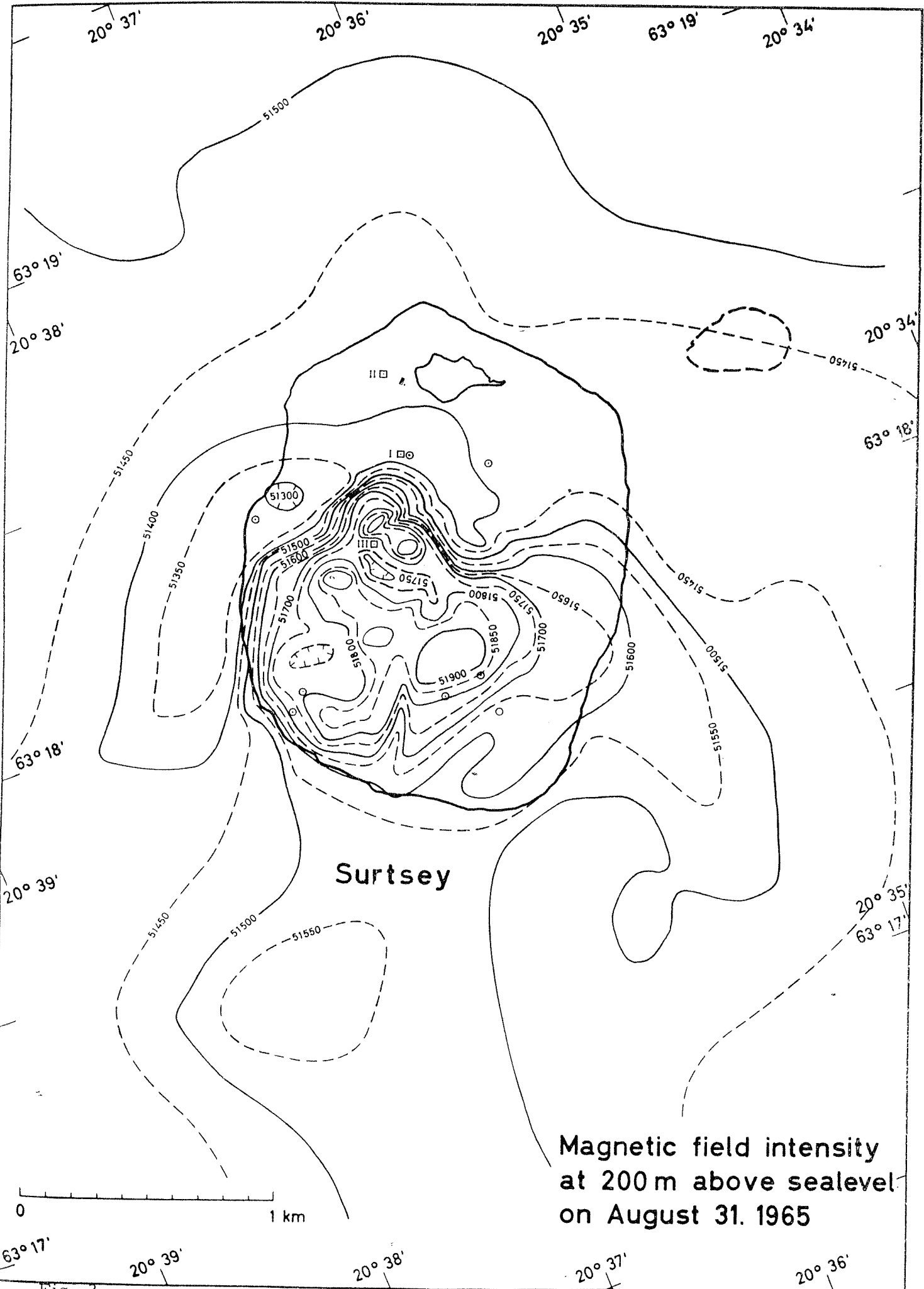


Fig. 1



Magnetic field intensity
at 200 m above sealevel
on August 31. 1965

Fig. 2