Eldgígur at Hágöngur, a Prehistoric, Subaëric Volcano at the SW-Edge of Vatnajökull.

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By

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In the middle of the river plain immediately east to southeast of Hágöngur is a small explosive volcano entered in the map as "Eldgígur"[1]) (Geod. Inst. Copenhagen, sheet 77, "Lómagnupur"). It is 854 metres above sea level. (Fig. 1).

The volcano is subaëric and quite unaffected by the ice; it is strictly concentric and shows remains of three slag walls one inside the other. Inside the innermost wall are two small and one larger crater which represent the last stage of the volcanic activity on the spot. The largest of these small craters has produced a small lava flow. The rest of the volcano is built up of loose materials only: scoriae, bombs and more fine-grained volcanic products. When viewed from a distance all the material seems red, but on closer investigation a number of almost black ejacamenta will also be found. Several of the bombs have been shaped during their passage through the air. Throw-slags of irregular, most often elongated irregular pieces of lava are frequent.

A sample of the red, fairly porous lava and of a compact, greyish, plagioclase-porphyric piece of lava from the outer slag wall were examined under the microscope.

The pores in the lava are mostly round and give no indication of flow movement during their formation. The interstitial mass is almost black and non-translucent and contains only very few, small plagioclase laths and equidimensional phenocrysts of clinopyroxene.

The piece of compact, grey lava shows a more advanced crystallisation, and the groundmass is greyish, translucent and "gritty".

The phenocrysts, *plagioclase* and *monoclinic pyroxene* are the same in both cases. The longest laths of plagioclase may be 2 millimetres; the pyroxene about half as long. A few remnants of *olivine* phenocrysts occur heavily filled with small individuals of *ore*, in one instance chiefly along the periphery, in another almost the whole individual is filled with them.

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[1]) Eldgígur means crater in Icelandic.

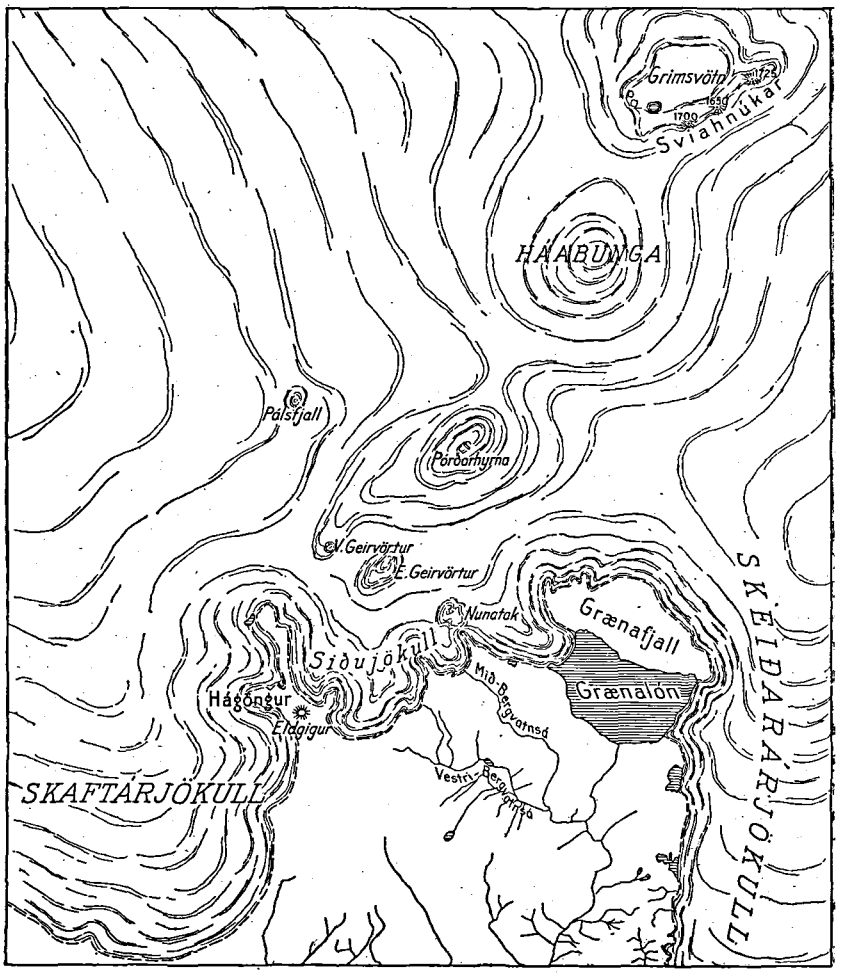

Fig. 1.

What can be seen of unaltered olivine is colourless, the mineral is no doubt a forsterite-rich olivine.

The *pyroxene* shows hour-glass structure and often an irregular fan-extinction. Twinning on (100) is common. The following values for the angle of optic axes were determined

Porous red lava ..... $2\,V\gamma = 50°, 53°$.
Compact grey lavapieces ..... $2\,V\gamma = 48°$.

The *plagioclase* phenocrysts show a somewhat irregular extinction and may be zoned. When measured on the FEDOROW stage the central parts of the phenocrysts gave the following values for the anorthite content:

Red porous lava ..... 72 %, 70 % an,
Dark grey compact lava piece ..... 75 %, 65 % an,

in other words, the initial composition of the phenocrysts is bytownitic.

A chemical analysis of the red porous lava was kindly made by ME MOURITZEN with the following result:

Table 1.

	1	2	3	Eq-Mol % of 3		Eq-Norm of 3
SiO_2	50.46	54.47	48.81	Si	47.3	Q 8.25
TiO_2	2.68	1.46	1.92	Ti	1.4	Or 1.5
Al_2O_3	13.86	16.12	15.58	Al	17.8	Ab 22.0
Fe_2O_3	1.56	0.53	12.95	Fe···	9.4	An 32.75
FeO	12.28	8.97	0.62	Fe··	0.6	$\Sigma_{sal} = 64.5$
MnO	0.23	0.18	0.24	—	—	Ap 0.4
MgO	5.14	4.71	5.79	Mg	8.4	Il 1.2
CaO	9.96	8.76	10.92	Ca	10.3	Tn 2.4
Na_2O	2.86	3.05	2.39	Na	4.4	He 9.4
K_2O	0.50	1.03	0.28	K	0.3	Wo 5.3
P_2O_5	tr	tr	0.17	P	0.1	Fs 0
Cl	0.04	—	—			En 16.8
S	0.13	—	—			$\Sigma_{fem} = 35.5$
H_2O^+	0.11	0.54	0.38	} (H_2O)	(1.8)	
H_2O^-	0.29	0.20	0.14			
Sum	100.10	100.12	100.19	100.0		100.0

No. 1. Lava from Grimsvötn (1934-eruption). W. H. and F. HERDSMAN anal. (NOE-NYGAARD, 1951).
No. 2. Lava from Hágöngur. W. H. and F. HERDSMAN anal. (NOE-NYGAARD, 1950).
No. 3. Lava from Eldgígur at Hágöngur. ME MOURITZEN anal.

Table 1 shows the Eldgígur analysis as compared with materials from two neighbouring volcanic orifices, i. e. Grímsvötn in Vatnajökull and Hágöngur at the edge of the same glacier. In the Eldgígur analysis the inverted FeO: Fe_2O_3 values point to a high state of oxidation of the iron present, otherwise there are few differences of significance between the three lavas apart from SiO_2. Probably they are mutually related.

Since history contains no information about volcanic eruptions in this locality (THORODDSEN, 1925) the activity of Eldgígur is likely to be prehistoric. As further the volcano is subaëric, and as it is now situated in a pocket in the ice edge less than one kilometer from the border line of Vatnajökull it must be inferred that in this place the ice cannot have changed its position much for quite a long time. It is highly probable that the neighbouring Hágöngur volcano has been partly covered with ice during its active period (NOE-NYGAARD, 1940, 1951), and it is therefore

likely to be the older of the two volcanoes, even if, to-day it is nearer the ice edge than Eldgígur. The only thing which can be stated with certainty, however, as to the age of Eldgígur, is that it is post-glacial.

LITERATURE

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