Analyses of a Variety of Saponite.

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THE variety of *saponite* described in the following note was first obtained by Mr. Walter Burns, of the Geological Society of Glasgow, from a quarry in the Cathkin Hills, about three miles S.S.E. of Glasgow. The quarry is hewn out of dark-coloured dolerite, rich in olivine, which rests on beds of felspathic ash. The dolerite has in places been converted into a green-coloured fibrous variety of saponite (*Bowlingite*), which is found in veins of from 2 to 3 inches in thickness. This variety has been analysed by Prof. Heddle, as well as by Mr. G. Wallace Young and Mr. G. B. Hannay.*

The mineral to which this note refers occurs near the base of the dolerite, in irregular, lenticular, horizontal veins or patches which lie near the base of the quarry, about thirty feet below the surface, and swell out in places to a thickness of 6 or 8 inches. It is of a deep chocolate-brown colour, has a well-marked conchoidal fracture, a very uniform structure, and the soapy feel characteristic of most hydrated silicates of magnesia. When taken from the quarry it is dull, but slight rubbing with the soft part of the hand imparts to it a high polish. When placed in water it splits into sharp angled fragments, ultimately crumbling, and on this account its specific gravity cannot be determined with accuracy. Hardness about 2. Specific gravity of the powder about 2·214.

Some of the specimens contain numerous minute particles of foreign matter. These are probably crystals of carbonate of lime; at all events, analysis of the mineral shows that it contains carbonic acid; and, on examining some of the powder with the polariscope, numerous double-refracting particles are discernible amongst the opaque particles of the *saponite*. The mineral is much too soft to allow of transparent sections being cut.

When treated with hydrochloric acid, the mineral effervesces faintly, and dissolves, leaving a residue of insoluble silica. Chemically it is essentially a hydrated silicate of magnesia.

* See *Min. Mag.*, 1877, and *Trans. Geological Society of Glasgow*. Vol. II., p. 212.

Analysis of three samples gave the following results :—

	I.	II.	III.
SiO_2 ...	40·07	39·90	40·81
Al_2O_3 ...	6·61	6·94	6·77
Fe_2O_3 ...	4·16	3·75	4·28
FeO ...	8·69	8·91	8·73
CaO ...	2·67	2·32	2·09
MgO ...	19·24	19·28	19·76
CO_2 ...	·38	·4	·36
H_2O ...	17·16	17·28	17·11
Alkalies...	trace	trace	trace
Total...	98·98	98·78	99·91

Water given off at 100° C, 13·02.

The following numbers give the average composition of *saponite*, as determined by Prof. Heddle, by analyses of specimens from thirteen different localities :—

SiO_2	40·63
Al_2O_3	7·18
Fe_2O_3	3·96
FeO	2·38
CaO	2·14
MgO	21·43
H_2O	21·76

Water given off at 100° C, 14·2.

It is evident from a comparison of these numbers, that the Cathkin Hill mineral is closely allied in chemical composition to the hitherto described varieties of *saponite;* the chief differences being the larger percentage of iron protoxide and the smaller percentage of total water. The amount of water, however, given off at 100° C., which Prof. Heddle considers an important character, is almost the same.

Looking to the differences in the composition of the rocks from which *saponite* is derived, and to the varying conditions under which its formation takes place, it is not to be wondered at that varieties differing somewhat in composition should from time to time be discovered. It is chiefly on account of its very remarkable physical characters that it has been thought worth while to call attention to this variety.