

II.—*On some Ill-determined Minerals.*

By PROFESSOR HEDDLE.

*Read December 23rd, 1880.*

THE following substances have, for the most part, passed under the names here assigned to them; but they are themselves either ill-determined, or doubtful species: in some cases the name has been attached to certainly more than one specifically-distinct substance.

*Plynthite.*

From Quiraing in Skye. It occurs in layers of an inch or two in thickness, among the amygdaloids. It is usually of a deep-red colour and has a greasy lustre, but is sometimes earthy and dull.

It falls to pieces in water, and may, by this property, and its uniformly dense structure, be distinguished from the red *massive mesolite* which sometimes occurs along with it.

It yielded—

Silica	.. .. .	29·547
Alumina	.. .. .	19·027
Ferric Oxide	.. .. .	28·013
Ferrous Oxide	.. .. .	3·251
Manganous Oxide	.. .. .	·844
Lime	.. .. .	2·234
Water	.. .. .	17·391

100·307

It loses 6·687 per cent of moisture, at 212°.

At the Storr in Skye it occurs in a *repeated series* of beds. It is evidently merely *bole*, and probably has resulted from a *bed of earth* which has been covered, and burnt by a trap stream.

*Ugite.*

Noticing in an old number of the *Mineralogical Magazine* a query as to *ugite*, it came to my recollection, that my description and analysis of this substance had possibly never appeared in a scientific journal, except

in the Ed. N. Phil. Journ. II, iv., p. 162. I therefore give an extract from a notice of it, which appeared in the "Witness" newspaper of 12th March, 1856.

"Sixteen miles north of Portree, in Skye, lies the "farm town" of Uig. At about the fifteenth mile-stone, the road makes an abrupt turn to the east, before descending the hill; and just at this spot a small quarry has been opened for the purpose of obtaining road-metal. In this quarry I obtained indifferent specimens of *faröelite*, a single crystal of *analcime*, and a few pieces of a substance which, being unknown to me, I analysed, and which may be considered new. Should this be admitted, I would propose for it the name *uigite*. It occurs in small nests in the amygdaloid, which is here very vesicular, is not distinctly crystallized, being in radiated sheafy plates, somewhat resembling the structure of a plumose mica, but in general appearance is intermediate between *faröelite* and *gyrolite*; colour white, slightly yellowish; lustre tremulous and pearly; hardness, 5·5; brittle; specific gravity, 2·284; before the blow-pipe fuses readily and quietly, with strong re-action of soda, to a white opaque enamel, which is not frothy. On analysis it afforded on two occasions.

Silica	..	..	..	..	46·320	..	..	45·980
Alumina	..	..	..	..	21·348	..	..	21·928
Lime	..	..	..	..	16·361	..	..	16·150
Soda	..	..	..	..	4·698	..	..	4·685
Water	..	..	..	..	12·212	..	..	11·250
					100·939			99·993

These proportions give equivalents,—silica, 7; alumina, 3; lime, 4; soda, 1; water, 9. The mineral, therefore, consists of 1 equivalent of a silicate of lime and soda (where the lime is to the soda as 4 to 1), 1 equivalent of a sesquisilicate of alumina, and 9 of water. The calculated percentage proportions of which compound are,—silica, 46·09; alumina, 21·93; lime 15·97; soda, 4·46; water, 11·55; which percentages agree closely with the analytical results. No mineral has the above formula, which differs, however, from that of *faröelite* (mesole), merely in the insertion of the compound  $2(\text{Ca O, SiO}_2) + \text{H. O.}$  We have now to see whether it is not a compound mineral, *i. e.*, a combination of two minerals; (as its composition is capable of expression by a rational formula, the substance cannot be a *mixture*.) For this purpose, let us look for an instant at *gyrolite*, the new mineral lately discovered by Dr. Anderson, in Skye. That chemist gives  $2(\text{Ca O, Si O}_2) + 3 \text{ H O}$ , as the formula of *gyrolite*, which requires 15·40 per cent of water, but admits that the mineral readily loses water, and that none but specimens newly broken from the rock

contain so large a quantity. While I myself am strongly inclined to think that even fresh specimens have an atom less of water, yet I am not at present prepared definitely to say so; but I am prepared to assert that the specimens of gyrolite ordinarily procurable, and such as are to be found in cabinets, have more probably the formula  $2(\text{Ca O, Si O}_2) + \text{H O}$ ;—as I have obtained many such percentage proportions of water as the following are:—6.417; 5.98; 6.83, &c.:—the last given formula requires 5.72. Gyrolite would thus seem to be a mineral which, like *Lomontite*, loses a certain quantity of water at once on the very exposure to the air; and, like *Lomontite*, this loss is accompanied with other changes—as of form, colour, lustre, &c.; for, when fresh, *gyrolite* is colourless, transparent, of a vitreous lustre, and tough; after a short exposure it becomes white, opaque, of a pearly lustre, and crumbles readily. Now, this latter formula of gyrolite is the very compound which we have to add to the formula of *faröelite*, to convert it into the formula of *uigite*,—as before shown. Three equivalents of *faröelite* united with one of *gyrolite*, will give a compound agreeing closely with the analysis of *uigite* and giving the same formula. I have already noticed that in appearance *uigite* stands intermediate between the above minerals. Under this consideration of the subject, therefore, *uigite* is made up of three equivalents of *faröelite*, and one of *gyrolite*; if we are not allowed to consider *gyrolite* as having ordinarily the above formula, then *uigite* must stand as a *simple* and not a *compound* mineral. I do not, however, dogmatically thrust it into the world as a new mineral; but, waiting for more information, would merely make a note that such a compound as I have described is to be found at *Uig*, in *Skye*.”

In consequence of the modern reading of the composition of silica, the above formulæ have to be altered.

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#### *Ferrite.*

This was sent to me by Mr. John Young, of Glasgow, as the *ferrite* of the late Wallace Young.

It was first given me, however, by the late Dr. Thomas Brown, of Lanfane, as “a new mineral.” Dr. Brown’s specimens,—which are identical in appearance, though hardly so well marked as Mr. Young’s,—were from the neighbourhood of Kilpatrick.

Mr. John Young’s specimens were from the Gleniffar Braes. The mineral occurs in crystals, imbedded in an altered dolerite. The crystals are deep red to chocolate brown in colour; they have two cleavages, which are both lustrous. They are easily broken, or rather split, along the cleavage faces; and they are so soft as to be bruised by the nail.

Subjoined is its analysis, tabulated as obtained after heating in the water-bath, and also in its ordinary state.

	DRY.	ORDINARY.
Silica .. .. .	13·544	13·025
Alumina .. .. .	13·684	13·160
Ferric Oxide .. .. .	55·600	53·473
Ferrous Oxide.. .. .	4·691	4·511
Manganous Oxide .. .. .	·154	·148
Lime .. .. .	·780	·750
Magnesia .. .. .	6·888	6·624
Water .. .. .	4·744	8·394
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	100·085	100·085

The mineral was found to lose 3·832 per cent. of water at 212°; and, as it was analysed by Wallace Young, *after having been dried at 212°*, the calculated percentages in the dry condition have been given in the first column, in order to compare them with the analysis of Mr. Young.

Mr. Young got in his analysis, 9·53 per cent. of *mixed quartz*;—deducting this, and adding 3·832 p.c. of water, to bring the constitution up to that of the mineral *in its ordinary state in nature*, we get the percentages in the second column, by calculation from the first.

*Young's Analysis.*

	DRY.	ORDINARY.
Silica quartz .. .. .	9·53	
Silica .. .. .	11·80	12·539
Ferric Oxide .. .. .	68·93	73·272
Magnesia .. .. .	5·26	5·591
Water .. .. .	4·66	8·778
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	100·18	100·18

At the first glance this appears a very different result from mine; but if it be supposed—which is far from impossible—that, in presence of the high colour of the precipitate obtained by ammonia, Mr. Young did not suspect alumina, and that he did not separately estimate the *ferrous oxide*—which at the date of his analysis was hardly ever done—but weighed and estimated the whole ammonia-precipitate as *ferric oxide*, the two analyses will be found to be really close.

My own analysis *tabulated in such a form*, is given as under 1; Mr. Young's as 2.

Silica .. .. .	<sup>1</sup> 13·025	<sup>2</sup> 12·539
Ammonia precipitate	71·793	73·272
Lime .. .. .	·750	
Magnesia .. .. .	6·624	5·591
Water .. .. .	8·394	8·778
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	100·085	100·18

There can thus be no question that *the same substance* was analysed ; and that the mineral is an alteration-product of either *augite* or *olivine* ; indeed Mr. Young has sent me unaltered specimens of rock, containing imbedded and unchanged crystals of both of these minerals. Ferrite seems therefore to have a doubtful claim to rank as a mineral, or to be, at most, a pseudomorph.

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*Craigtonite.*

Stains, dendrites, and thin filmy coatings on rocks, are very frequently pronounced to be "manganese" or manganesean ; if these have a brown or even a blue colour.

I have qualitatively ascertained that this they sometimes, are,—to the extent at least of *containing* manganese ; especially such as are seen in rifts of Old Red Sandstone. Only once however have I got a sufficiency to make anything approaching to a quantitative analysis. This single instance was a thin coating which adheres to red granite in the upper quarry of Craigton, Hill of Fare, Aberdeenshire. Its colour is blue-black ; here and there it has a lustre like graphite ; it cuts with the knife.

There being too small an amount to admit of its being picked it was dissolved off the granite by very weak hydrochloric acid. The acid seemed hardly to affect the *lepidomelane* present, and the granite seemed altogether unaffected. In addition to the lepidomelane, the granite contains only *orthoclase* and *quartz*.

The analysis of the solution gave—

Alumina .. .. .	32·203
Ferric Oxide .. .. .	38·305
Manganous Oxide .. .. .	7·458
Magnesia .. .. .	16·610
Potash .. .. .	4·745
Soda .. .. .	·678
Silica .. .. .	tr.
	99·999

As chlorine was evolved during the solution, the manganese must have been partly at least in the state  $Mn_2O_4$ .

I make no attempt to reduce this composition to any formula ; and have given it a name merely as a nucleus to other analyses of the same or similar substances.

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*Ellonite.*

This is an *ad-interim* name given to a pale dull yellow, somewhat unctuous powder, which I got out of small nests, occurring rarely in perfectly fresh recently blasted gneiss.

It was from a quarry about half a mile west of the railway station at Ellon, in Aberdeenshire. The associated minerals, which were perfectly unaltered, were *orthoclase* and *lepidomelane* (?)

I obtained—

Silica .. .. .	63.000
Alumina .. .. .	3.051
Ferrie Oxide .. .. .	1.674
Ferrous Oxide .. .. .	1.457
Manganous Oxide .. .. .	.692
Lime .. .. .	1.291
Magnesia.. .. .	15.615
Potash .. .. .	.630
Soda .. .. .	.794
Water .. .. .	11.700
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	99.904

Loses 6.365 per cent of the water, at 212°.

There can be little doubt that there is free silica here;—though the powder was sifted through fine linen, to ensure uniformity. I can offer no opinion as to what the unmixed substance is. Possibly it may be of the nature of *cimolite* or *sepiolite*.