XVI. *Account of the Native Hydrate of Magnesia, discovered by Dr HIBBERT in Shetland. By DAVID BREWSTER, LL. D. F. R. S. LOND. & SEC. R. S. EDIN.*

(Read January 8. 1821.)

THE Native Hydrate of Magnesia was first discovered, and ranked as a separate Mineral, by the late Dr BRUCE of New York. It was found only at Hoboken in New Jersey, traversing serpentine in every direction, in veins from a few lines to two inches in thickness. Its specific gravity was 2.13, and it yielded upon analysis 70 parts of pure magnesia, and 30 of water*.

In the year 1813, I received some fragments of this rare mineral from our late eminent countryman Dr JOHN MURRAY, and though it exhibited no traces of a crystalline structure, I found it to be a regularly crystallised mineral, with one axis of double refraction perpendicular to the laminæ†. The connection between the primitive form of minerals and their number of axes of double refraction, which I observed at a subsequent period, enabled me to determine that the Native Hydrate of Magnesia belonged either to the *Rhomboidal* or the *Pyramidal* system of MOHS.

In

* See BRUCE's *American Mineralogical Journal*, vol. i. p. 26.—30.

† See *Phil. Trans.* 1814. p. 213., and 1818, p. 211.

In this state of our information respecting native magnesia, Dr HIBBERT, who has distinguished himself by his excellent mineralogical survey of Shetland, and augmented our national resources by the discovery of Chromate of Iron in large quantities, put into my hands a mineral from Shetland, which had been considered by mineralogists as *White Talc*, but which, he was persuaded, differed materially in the nature of its ingredients from that substance. In consequence of being familiar with the Hoboken Magnesia, I considered the Shetland specimen as the same mineral; and I put this opinion beyond a doubt, by establishing the identity of their optical properties, and also by a chemical examination of the two substances.

Mineralogical Character.—The structure of Native Hydrate of Magnesia is distinctly lamellar. The laminæ sometimes diverge from a central line, and frequently occur in groups, with the laminæ of one group inclined to those of another, like the masses of mica in granite.

The colour of the laminæ is white, and a slight tinge of green is sometimes observed, when we look upon their edges. They are perfectly transparent when separate; but I have noticed in specimens exposed to the weather, a dull and white opacity, which had been induced by the separation of the mineral into a greater number of minute laminæ. This white part has the same relation to the transparent part as *Albin* has to *Apophyllite**, and, as happens with this mineral, the disintegration follows the crystalline structure of the body. One specimen of this kind exhibited a six-sided prism, the interior of which was undecomposed, while all the external part had a white opacity.

The Native Hydrate of Magnesia scratches *Talc*, from which it may be easily distinguished, as the former marks white paper with a silvery powder, whereas the latter gives only

* See *Edin. Phil. Journal*, vol. i. p. 5.

only a polished line, and leaves none of its own substance. Its hardness seems to be 1.5.

In several specimens I have observed a distinct crystalline structure, in the form of the regular hexahedral prism. The pyramidal form being therefore excluded, it will belong to the *Rhomboidal* system of MOHS.

Its specific gravity is 2.336. It adheres very slightly to the tongue; and it will constitute a new Genus of the 5th Order, or that of MICA in the 2d Class of MOHS' system, unless the order of *Talc-Mica* is modified to receive it.

Locality.—Dr HIBBERT found this substance, in 1817, at Swinanness in Unst, one of the Shetland Isles, traversing serpentine in all directions, being mixed with the Magnesian Carbonate of Lime, and forming veins from half an inch to six or eight inches broad.

Chemical Character.—Hydrate of Magnesia dissolves entirely in muriatic, nitric and dilute sulphuric acids, and I obtained from its solutions in the muriatic and sulphuric acids, the deliquescent salt of *Muriate of Magnesia*, and regular crystals of *Sulphate of Magnesia*. On some occasions a very slight effervescence takes place; but this no doubt arises from adhering particles of carbonate of lime, or from a small quantity of carbonic acid, which may have been absorbed by exposure to the atmosphere.

The following analysis of this mineral has been made by Dr FYFE, since the preceding account of it was drawn up:

Magnesia,	-	69.75
Water,	- -	30.25
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		100.00

a result which differs only a quarter of a *per cent.* from that of Dr BRUCE of New York.

Optical Structure.—The Native Magnesia has *One* axis of double refraction perpendicular to the laminæ, and exhibits the single system of coloured rings traversed by a black cross. The character of its action is *Positive* like that of *Quartz*, and the tints which it polarises are different from those of NEWTON'S scale, resembling somewhat those which surround the resultant axes of Selenite*. This mineral is not phosphorescent by heat.

Distinctive Character.—The Hydrate of Magnesia is distinguished from *Talc*, by its having one axis of double refraction, while *Talc* has two axes;—by its lower specific gravity, and greater hardness;—by its marking paper with a polished line, in place of a silvery one, as already noticed; and by its solubility in acids. It is distinguished from the *Common Mica* with two axes, by the elasticity of the latter, as well as by its two axes; and it is equally distinguished from the less flexible *Mica of Kariat in Greenland*, and from other micas that have only one axis, by that axis being positive in the *Magnesia* and negative in the *Mica*, and also by the character of the tints with which the axis is encircled.

It is distinguished from *Selenite*, by its having one axis of double refraction perpendicular to the laminæ, whereas *Selenite* has two resultant axes lying in the plane of the laminæ;—by the want of regular cleavages,—and by its solubility in acids.

* See *Phil. Trans.* 1818, p. 243.