## XI.—*Contributions to the Mineralogy of Nova Scotia.*

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(*Continued from L.E.D. Phil. Mag., Feb.*, 1876.)

### 1, Cryptomorphite and Priceite not Identical in Crystalline Form.

In 1861, I described (Edinburgh New Philosophical Journal, and American Journal of Science) a borate, found with glauber salt in gypsum at this place, as a new mineral, by the name of Cryptomorphite, on account of its amorphous appearance to the naked eye being resolved into one most distinctly crystalline, under the microscope.

The first criticism on the mineral was made by Prof. Geo. J. Brush (Tenth supplement to Dana's Mineralogy), who said, in effect, that it could not be accepted and named as a new and distinct hydrated borate of soda and lime, because there were already too many names in use for minerals, not clearly made out to be distinct, having more or less closely similar composition. Professor Dana, however, was of a different opinion, for in a letter dated Nov. 5th, 1867, referring to a specimen I had sent him, he said "Cryptomorphite appears to be unquestionably a good species." In the American Journal of Science for August, 1872, it was announced editorially that cryptomorphite occurs in Nevada in nodules from 4 to 6 inches to as many feet (*sic.*), with the appearance of French prepared chalk; the deposits were said to be extensive, but the discoverer declined to tell the locality. The mineral was found to be a "form of borate of lime." The next year, two papers appeared in the same journal, one in April, on "oregon borate of lime (cryptomorphite?)" by A. W. Chase; the other in August

"Mineral notes on Utah, California, and Nevada, with the description of priceite, a new borate of lime," by Professor Silliman. This new borate of lime was the oregon mineral, and the author gave it the name priceite after stating that "this mineral is clearly different from the cryptomorphite of How, to which it has been provisionally referred by Price and others. It has the microscopic crystallization described by Dr. Robb as belonging to the Nova Scotian species, but the absence of soda and the greater ratio of protoxide base carries it much nearer to hydro-boracite, from which it is separated by containing no magnesia and less water."

The description of the crystallization of cryptomorphite alluded to as observed by Dr. Robb, of Fredericton, New Brunswick, in 1861, is as follows, in a letter to myself, soon after I had sent him a specimen for examination. "The mineral just as I got it, untouched and unwashed, is perfectly crystalline in every particle. A good power is required, but with a magnifying power of about 350 diameters there is no difficulty, the form comes out as sharp as possible. The crystals are excessively thin translucent tables or plates. They have a rhombic outline, and the angles probably = 80° or more. Owing to the excessive thinness I could not say whether they could be called right or oblique rhombic prisms; I suspect the latter from analogy. The plates are about ·0048 of an inch from side to side, but some are a little larger, others a little smaller. In some you see a regular cleavage—that is, a small rhomb chipped out of one side. I presume it was formed in a dry place, for the angles were quite sharp."

The characters of the oregon borate under the microscope agree closely enough with this description to have led to the confounding of it with the Nova Scotian mineral in the first instance. My object just now is to show that the crystalline forms of the two are, however, really quite distinct.

The excessive thinness of the crystals of cryptomorphite was sufficiently striking to call for a repeated mention by the first observer with the microscope, Dr. Robb, and was soon after seen by myself. Now, priceite, for specimens of which I am indebted to Professor J. D. Dana, of Newhaven, and to Professor G. Davidson, of San Francisco, exhibits most unmistakeably much thicker rhombic plates. Again, some of the angles of cryptomorphite are given by Robb as = 80° or more, while those of priceite corresponding are considerably more acute, about = 50°; and, still further, a much

lower power suffices to bring out the crystals of priceite than is the case with cryptomorphite, so that their measurement would much exceed that for the latter as given above by Robb. Mr. S. D. Mills, who kindly went through the comparative observations with me under his own microscope, said he should have no difficulty in separating the two minerals by their form. These observations complete the distinction first shewn (*loc. cit.*) to exist between cryptomorphite and priceite, on chemical grounds, by Professor Silliman. The comparative quantities in which the two minerals have been met with is also worth notice. While the latter is in large masses, measured by feet, in considerable deposits, the former has been found only in very small nodules, not longer than a pea, imbedded in glauber-salt, in one thin vein between gypsum and anhydrite. No doubt a good deal has been thrown away as "salts." I have only been able to secure a small quantity once since the original finding, though I have from time to time asked the quarrymen, when working at the part of the rock holding the vein, to save me "the salts." All I have ever had amounted to less than 100 grains probably of cryptomorphite, washed free of impurity, and a pound or two of glauber-salt holding the mineral, and mixed with fragments of gypsum.

2. SILICOBOROCALCITE, *How* (HOWLITE, *Dana*) REPORTED IN LARGE NODULES.—I may recall that this mineral has been met with in the chalky form at Noel, Hants. Co. (contrib. IV. Phil. Mag., April, 1869), about 40 miles N.E. of Brookville, where it was first obtained in small nodules, both hard and chalky (contribution III, Phil. Mag., Jan. 1868), for the purpose of recording that it has since been reported to occur at Noel, in nodules sometimes as large as a man's head.

3. TABULAR VIEW OF SOME ALLIED BORATES.—As the foregoing and some other hydrated borates of sodium and calcium, or of the latter alone or with silica, are confounded, I may mention as further examples, that I saw mentioned in a printed catalogue of an eminent British collector, a specimen of "Howlite in fibrous crystals—a form not assumed by the mineral—it was doubtless ulexite; and in the elaborate catalogue of an American mineralogist, cryptomorphite is named where the mineral is certainly priceite, and as their composition and characters, as lately ascertained in some cases, are nowhere collated, the following table may be useful; the minerals are all white.

| MINERALS. | FORMS. | LOCALITIES. | EMPIRICAL FORMULÆ. |
|---|---|---|---|
| Ulexite. | Acicular prisms, and fibrous layers and nodules, dull and of silky and satin-like lustres. | S. Peru; Bolivia; Nevada; Arizona; W. Africa; Hants Co., Nova Scotia. | $Na_2O.2CaO.5B_2O_3.15 H_2O$. How. |
| Franklandite. | Fibrous nodules. | Tarapaca, Peru. | $2Na_2O.2CaO.6B O_3.$ $15 H_2O$. Emerson-Reynolds. |
| Cryptomorphite. | Very small chalk-like nodules, shewing *mic.* very thin rhombic plates of about 80° | Windsor, Hants, N.S. | $Na_2O.3CaO.9B_2O_3.12 H_2O$. How. |
| Priceite. | Large chalk-like nodules, shewing *mic.* thick rhombic plates of about 50° | Chetko, Sea Coast, Curry Co., Oregon. | $CaO.4B_2O_3.6H_2O$. Silliman. |
| Hayesite.* | Fibrous nodules. | Bolivia, Peru. | $CaO.2B_2O_3.6H_2O$. Hayes. |
| Howlite. | Highly pearly, scaly, & amorphous nodules. | Hants, Co., N.S. | $4CaO.5B_2O_3.2SiO_2.$ $5 H_2O$. How. |

*At the dry Lake of Maricunga, Borocalcite (Hayesite) is estimated to exist to the amount of 14,000,000 tons, mixed with Nacl, but without Ulexite, (natro-borocalcite). See Silliman's Jrnl., August, 1874.