Camsellite is the seventeenth borate found in the State and owes its origin probably to borated waters of a hot spring acting on the serpentine.

BARITE AND ASSOCIATED MINERALS IN CONCRETIONS IN THE GENESEE SHALE

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Concretions in the Genesee shale near Cayuga and Seneca lakes in central New York contain barite and several other minerals, some of which do not seem to be generally known as occurring in this region. These concretions were briefly mentioned in the reports on the geology of the third and fourth districts of the State by Lardner Vanuxem[1] and James Hall,[2] respectively. The former seems to have mistaken the large white crystals of barite for celestite, but perhaps actually found celestite in place of barite at some locality.

The concretions described in this paper occur in the Genesee shale about 30 feet from the base of the formation. The extent of their geographic distribution has not been determined, but they were seen by the writer in gorges along Cayuga Lake at several localities between Portland Point on the east side, and Interlaken, nearly 15 miles to the northwest on the west side of the lake; also near Lodi on the east side of Seneca Lake. Concretions which may be similar to these are reported by Hall as occurring in this formation in the gorge of the Genesee River.

The concretions, which are composed of a hard, dark limestone, are lenticular in shape and flattened parallel to the bedding of the shale. More rarely they are nearly spherical. In horizontal section all are circular or elliptical. The smallest ones are about 30 cm. (1 foot) in diameter by 10 or 12 cm. (4 or 5 inches) thick, and the largest ones have at least twice these linear dimensions. The shale laminations bend around the concretions both above and below, and the joints in the shale cut across both the concretions and the veins which they contain.

[1] Vanuxem, Lardner, Natural History of New York, Geology, part III, p. 169, 1842.

[2] Hall, James, Natural History of New York, Geology, part IV, pp. 219, 221, 1843.

In nearly all of these concretions there are cracks partly or completely filled with vein minerals, and in some these are abundant enough so the concretion might properly be called a septarium. The widest veins are vertical or nearly so and while horizontal cracks occur they seem to have been held shut so tightly that little material could be deposited in them. Many of the vertical veins are widest in the center and some do not continue to the outside at all.

The minerals in these veins are barite, calcite, ankerite, quartz, marcasite, and sphalerite, named in order of abundance. Galena is also mentioned by Hall as being rarely present. Each of these minerals will be briefly described as to its properties and mode of occurrence.

Calcite was the first mineral to be deposited and lines most of the vein walls. It was also formed to some extent after the barite and quartz but apparently none was deposited after the ankerite. The older calcite is colored brown to black by unevenly distributed bituminous material. Crystal faces are rarely observed because they are covered by other minerals. Some of the younger calcite is in cavities which are still partly open, and consists of crystals of a rather blunt dog-tooth spar habit.

Barite occurs in white to nearly transparent crystals flattened parallel to (001) and frequently having this form parallel to the wall of the vein. The larger ones are 8 or 10 cm. (3 or 4 inches) in width by 2 or 3 cm. (1 inch) thick. The barite rests upon the earlier calcite and fills the spaces between the crystals. It seldom has crystal faces because of interference of one crystal with another or with the vein wall. In some instances an entire cavity is filled by a single barite crystal.

Ankerite fills in most of the spaces remaining between the barite crystals and is present in large amounts. It is yellow in color, has curved cleavage faces, and where a crystal is in an open space it shows the saddle shaped distorted rhombohedron so common on dolomite. The presence of iron is shown by the limonite stains produced by weathering and by the refractive index $\omega = 1.704$, which corresponds to about 15% $FeCO_3$, assuming that there are as many atoms of calcium as of iron and magnesium together.

Quartz occurs sparingly in clear colorless crystals showing the usual forms $(10\bar{1}0)$, $(10\bar{1}1)$, and $(0\bar{1}11)$ with very narrow faces of steeper rhombohedrons. Where its relation to the other minerals

could be determined it is younger than the barite but older than the ankerite and part of the calcite.

Marcasite is present in small amount in some of the concretions as crystals only a few tenths of a millimeter in diameter.

Sphalerite of yellow color occurs in crystals up to 4 or 5 mm. in diameter, associated with the dark colored calcite. It was deposited before the barite.

The order of formation of these minerals is then, so far as could be determined, calcite, sphalerite, barite, quartz, calcite, ankerite with the position of the marcasite not definitely known.

It would be of interest to investigate the areal distribution of these concretions and to attempt to explain their localization at this particular horizon, and account for the concentration of the minerals in them. Upon casual examination the part of the shale containing them does not differ in any other way from the rest of the formation.

BOOK REVIEWS

LEHRBUCH DER MINERALOGIE. I, ALLGEMEINE MINERALOGIE. PAUL NIGGLI. Large 8-vo., 712 pages, with 553 text figures. Gebrüder Borntraeger, *Berlin*, 1924.

This is a complete revision of the first edition of this text, published in 1920 (*Am. Min.*, **7**, 125, 1922), which departed markedly from the conventional and well-established method of presenting mineralogical data and material.

The reception of the first edition was apparently of such a favorable character as to warrant the author to materially expand the new edition. Accordingly, the second edition will appear in three parts as follows: I, GENERAL MINERALOGY; II, SPECIAL MINERALOGY; III, MINERAL ASSOCIATIONS, the author applies the term "Minerocoenology" to this part. Of the three parts, GENERAL MINERALOGY or Part I, has been issued. Part II, SPECIAL MINERALOGY, will appear in the near future.

Following a short introduction (4 pages), the matter contained in Part I, is devoted to geometrical crystallography (137 pages), physical properties of crystals (233 pages), chemical properties of crystals (201 pages), and amorphous minerals (18 pages). The same high quality so characteristic of the first edition is maintained throughout this part, which will rank as a very valuable contribution to our science.

EDWARD H. KRAUS.

CRYSTALS AND THE FINE-STRUCTURE OF MATTER. FRIEDRICH RINNE. Translated into English by WALTER S. STILES. 8-vo., 195 pages, with a drawing by A. Duerer, and portraits of the leading investigators in the study of fine-structure, and 203 figures. Methuen & Company, Ltd., *London*, 1924.

This English translation of Professor F. Rinne's excellent survey of our knowledge of crystal structure, published in German in 1922 under the title of DAS