CAMSELLITE FROM CALIFORNIA[1]

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In the construction of a new highway along the east shore of Bolinas Bay, near Stinson Beach, Marin County, California, the road cuts through a mass of highly sheared and shattered serpentine mixed with white veinlets of calcium and magnesium carbonates. Imbedded in this mass are many small boulders of typical dark green serpentine, and in one small area these boulders are coated and impregnated with a white deposit of a minutely fibrous mineral as soft as flour. The mineral was observed and collected by Mr. Vonsen and he determined it to be a hydrous borate of magnesium, but with silica present, and samples were brought to the writer for identification. The mineral was evidently a new borate for California and was thought possibly a new mineral species. Its composition and indices indicate that it is the same borate that Ellsworth and Poitevin[2] described from a similar association in British Columbia and named, camsellite.

The Canadian borate was described as occurring intimately admixed with chrysotile and dolomite, to the extent of over twenty-three percent, according to their analysis, since they credited all the silica to chrysotile. This left by deduction a simple hydrous magnesium borate with an indicated formula, $2MgO.B_2O_3.H_2O$.

The writer is fortunate in having an abundance of the pure mineral for analyses. Every fissure of the boulders has been filled with the mineral so when they are broken practically every specimen is coated. No dolomite or chrysotile occurs with it and by lightly scraping the coatings pure material was obtained. The mineral was also floated for some of the samples and four different samples were used for the analyses. Silica and ferrous iron were present in constant amounts. Calcium and manganese were absent. The average of the analyses gave the composition:

	Percentages	Ratios	
MgO	46.07	1.142	=1.176=2
FeO	2.46	.034	
B_2O_3	33.34	.476	= .595=1
SiO_2	7.16	.119	
H_2O	10.94	.607	= .607=1
	99.97		

[1] Presented at the annual meeting of The Mineralogical Society of America, Ithaca, New York, December 31, 1924.

[2] H. V. Ellsworth and Eugene Poitevin: Camsellite, a new borate mineral from British Columbia, Canada. *Trans. Roy. Soc. Canada*, **15**, 1-8, (1921).

The formula indicated by the ratios is: 10 (MgO, FeO).$4B_2O_3$.SiO_2.$5H_2O$ but this is simplified to 2(MgO, FeO).(B_2O_3,SiO_2).H_2O by considering the SiO_2 as replacing B_2O_3. It is not a case of admixed silica or silicate, but rather a definite replacement of one molecule of B_2O_3, by SiO_2; otherwise the mineral is an isomorphous mixture of the borate and silicate of magnesium. The formula 4(2MgO.B_2O_3.H_2O).(Mg, Fe)$_2SiO_4$.H_2O will also fit the analysis, but the simpler formula seems preferable.

The formula 2MgO.B_2O_3.H_2O, given for camsellite requires 41.81% B_2O_3 and the analyses of the pure mineral show that only four-fifths of this amount is present, with silica representing the remaining fifth.

Ferrous iron is a constant constituent replacing some of the magnesia and is therefore included in the formula.

The theoretical composition of camsellite based on the formula: 2(MgO, FeO).(B_2O_3,SiO_2).H_2O with MgO:FeO = 34:1 and B_2O_3:SiO_2 = 4:1 becomes:

MgO	46.33
FeO	2.43
B_2O_3	33.46
SiO_2	7.13
H_2O	10.65
	100.00

The specific gravity determined with the pycnometer is 2.60.

The optical data were carefully determined by C. A. Anderson, Teaching Fellow in Mineralogy, and agreed closely with those already given for camsellite. The fibers show parallel extinction with negative elongation; $\alpha = 1.580$; $\gamma = 1.651$.

The solubility of the mineral tends to confirm the indicated fact that silica is a constituent of the fibers. We would expect a simple borate to be easily soluble in HCl but such is not the case with this camsellite. It is so slowly attacked that boiling for hours fails to decompose it, and this method of getting it into solution could not be used. However, after simple ignition it goes readily into solution with the separation of gritty silica. The silica may act like an opal in the fibers preventing them from ready attack by the acid and dehydration changes this condition of the silica.

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.**