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SZAIBELYITE FROM LINCOLN COUNTY, NEVADA.

J. L. GILLSON AND EARL V. SHANNON[1]

The borate mineral szaibelyite, or szajbelyite, found originally as radiating grains in a metamorphic limestone associated with ludwigite, in the Werktal at Rezbanya, in Hungary, has been found in a similar occurrence in a contact-metamorphosed limestone, about ten miles west of Pioche, Lincoln County, Nevada.

In the course of the field study of the Pioche, Nevada, district, Doctors Westgate and Gillson of the U. S. Geological Survey found a small copper prospect at the contact of a limestone with a quartz monzonite in the so-called Blind Mountain mineral district. Attracted by the exceptional abundance of the mineral ludwigite in the rock on the dump of the prospect, a number of specimens were collected. In their subsequent examination veinlets of a very acicular mineral were found cutting a magnetite-serpentine-ludwigite rock. A chemical analysis in the U. S. National Museum of material from the veinlets served to identify the acicular mineral as szaibelyite.

The exact location of the copper prospect can be found by reference to the Bristol, Nevada, topographic sheet of the U. S. Geological Survey. Blind Mountain is near the south margin of the sheet, and near its center in an east-west direction. It is a sharply pointed knob, around the summit of which the 7,700 foot contour closes in a very small circle. The summit is exactly 1.05 miles S. 44° W., from the Bench Mark 8,928 on the crest of the Bristol Range. The prospect at which the borate minerals occur, lies just one-half mile S. 65° W. from the summit of Blind Mountain, and on the northeast slope of a low hill of quartz monzonite which is itself not high enough to show on the topographic map.

The limestone around the monzonite mass is marmorized over a considerable area, but a strong development of silicates occurs

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only very locally. At the prospect the rock is not well exposed except on the face, where a banding of black ludwigite-magnetite-serpentine rock and a diopside-spinel rock is found. The igneous contact is probably within twenty feet. The copper stain which had attracted the prospector has been caused by alteration of a small amount of bornite present in the serpentine rock.

The szaibelyite occurs as disseminated grains and veinlets in the black banded material. The banding is in that peculiar subspherical, concentric manner not uncommon in certain contact-metamorphic deposits. The country rock is a white granular dolomite marble from which all of the original sedimentary character has been eliminated.

The sequence of the minerals forming in the marble is difficult to determine with certainty, but it is most probable that the szaibelyite is a late metamorphic mineral, and is not as supposed by M. Löw[2] to be a weathering product of ludwigite. Later minerals to form than the szaibelyite were hydromagnesite, brochantite and calcite. The hydromagnesite had formed along joint cracks as large clear crystalline masses. When observed under the microscope between crossed nicols the grains of hydromagnesite exhibit the twinning lamellae described by Rogers.[3]

Very considerable difficulty was encountered in separating the acicular szaibelyite from another needle-like mineral with which it is intergrown. Furthermore, all attempts to make a concentrate of this second and less abundant mineral for analysis, failed, and it remains unidentified. Its properties are as follows: uniaxial, optically negative, with indices of refraction, $\epsilon = 1.527$, $\omega = 1.561$.

Mineralogical data on the szaibelyite from Lincoln County, Nevada are: hardness 3 to 4; specific gravity, determined in liquids standardized by a Westphal balance, 2.76 at 22°C.; color, white, but on exposure becomes brownish; uniaxial, optically negative, $\epsilon = 1.575$ and $\omega = 1.650$. Index of refraction measurements were made in white light and have an accuracy of $\pm .003$. The mineral is fusible, but not readily soluble in acids.

Data on the original mineral given in Hintze[4] and Larsen[5] give indices of 1.59 and 1.65, a specific gravity of 3.0 and a similar

[2] Quoted in Hintze, Carl: Handbuch der Mineralogie, erster Band, neunzehnte Lieferung, p. 96, Berlin und Leipzig, **1921.**

[3] Rogers, A. F.: The crystallography of hydromagnesite: *Am. Jour. Sci.*, (5) vol. **6,** 37-47, **1923.**

hardness. Larsen gives the mineral as uniaxial but states that the mineral is soluble in acid. The Nevada material, however, after boiling a considerable time in acid to eliminate the dolomite was not optically or visibly affected.

Dana[6] gives the mineral as optically biaxial. The acicular fibers of the Nevada material can be turned upon end in a viscous medium and give an interference figure strictly uniaxial.

The chemical analysis of the Nevada szaibelyite was made on a very small amount (0.0476 grams) of material, and on a sample containing only about 90 per cent of szaibelyite and 10 per cent of the unidentified splintery mineral. The results are only the best possible estimations obtainable upon a sample of such size and quality. The silica and lime are probably foreign to the szaibelyite, but the ferric iron seems to belong in the mineral, probably as an isomorphous replacement of B_2O_3. A qualitative test on carefully picked material gave a strong reaction for ferric iron. Dana gives the formula as probably $4\,MgO.3B_2O_3.MgOH+H_2O$.

ANALYSIS OF NEVADA SZAIBELYITE, (Earl V. Shannon)

(Compared with analyses of original material[7])

	Nevada Szaibelyite	Hungarian Szaibelyite	
SiO_2	4.83	0.20	....
Al_2O_3	0.63	....	....
Fe_2O_3	4.21	1.66	3.20
B_2O_3	(31.22)*	36.66	34.60
CaO	1.26	....	....
MgO	46.72	52.49	49.44
H_2O+	9.87	6.99	12.37
H_2O-	1.26	....	....
Cl_2	....	0.49	0.20
	100.00	98.49	99.81

* By difference

The Lincoln County, Nevada, occurrence of szaibelyite is interesting because of the abundance of boron indicated in a very small mass of rock. At least twenty tons of rock rich in ludwigite lie scattered on the dump of the copper prospect, and the szaibelyite is very common in many of the pieces.

[4] Hintze, Carl: *Op. cit.*, p. 96.

[5] Larsen, E. S.: The microscopic determination of the non-opaque minerals: *U. S. Geol. Survey*, Bull. **679**, 197, (**1922**).

[6] Dana, E. S.: The system of mineralogy, 6th Ed., p. 878, (**1914**).

[7] Analyses taken from Hintze, Carl: *Op. cit.*, p. 96.