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Preliminary geologic report on the Berkshire mine, Berkshire, Franklin County, Vermont

by

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A small copper prospect known as the Berkshire mine is located in the town of Berkshire, Franklin County, Vermont, near the northeast corner of the Enosburg Falls quadrangle. It is reached by a gravel road extending northward about 1.5 miles from the post office at Berkshire, thence by a dirt road extending eastward for about 0.5 mile. The mine is located in a hay field at the end of the north fork of the dirt road. The property is about 1.5 miles south of the Canadian border.

The mine is owned by Mr. G.H. Moore of Melvin Street, Winter Hill, Massachusetts. 1/ It was formerly owned by the Vermont and Boston Mining Company and was worked for two or three years around 1905. No mill was constructed and no ore was shipped. A number of diamond drill holes is said to have been put down.

1/ Oral information concerning ownership, history, and development was supplied by Mrs. C.A. Bowen, wife of the town clerk of Berkshire; Mr. Max W. Jolley, postmaster of Berkshire; and Mr. Elwin G. Chambers, who owns an adjoining farm.

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A preliminary examination and sketch map were made on October 13, 1943.

The deposit has been described as follows: [2] "In Berkshire there is said to be a large deposit of chalcopyrite and bornite. The Vermont and Boston Mining Co. was at one time at work on this deposit, sinking a shaft 100 feet and drifting 85 feet. Some thesis work, done at Massachusetts Institute of Technology, showed the ore to carry 1.42% copper."

[2] Jacobs, E.C., Copper mining in Vermont, Rep't Vt. State Geologist, 1915-16, pp. 192-199.

Accessible workings (Plate I) consist of a small, irregularly shaped open cut. Mr. Chambers states that the main shaft, which has caved, is vertical, although it appears to be inclined steeply toward the west. Mr. Chambers further states that the drift was driven northward from the main shaft. Two possible shafts are located within the open cut. The more northerly one is purely hypothetical; all that can be observed is a pool of stagnant water, apparently deep. The more southerly shaft is based entirely on a statement by Mr. Chambers, as it is at present filled with dump fragments. This shaft is also said to be 100 feet deep.

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The rock along the walls of the open cut is light gray fissile quartz-sericite phyllite. The average strike of the cleavage is N 10-30° E, and the average dip is 70° E. Bedding, where it can be observed, is essentially parallel to the cleavage. Three beds of sericite phyllite, whiter in color and apparently more argillaceous in composition than the other rocks, have been intensely deformed. Within these beds, which are three to ten feet thick, the cleavage has been crinkled and sheared. The crinkles have an average wave length of one to six inches, and pitch 25 to 30°, N 10-30° E. The principal copper mineralization is restricted to the crinkled beds. A crude fracture cleavage, striking about N 15° E and dipping about 55° W, cuts across the crinkled beds. The intersections of the several cleavages and crinkles give the rocks a pencil structure in some places. It is possible that the three crinkled beds are in reality one, repeated by folding or faulting. This is particularly true of the beds on the north wall of the open cut.

About 300 feet east of the main shaft are the most westerly exposures of a wide band of greenstone and minor felsitic rocks. The lighter-colored phases may represent metamorphosed rhyolitic tuff, but much of the darker, more chloritic rock is probably intrusive. In many places the greenstone contains abundant epidote, as well as small veins of quartz, carbonate (including malachite), and of chrysotile. The presence of chrysotile (asbestos) suggests that the greenstone is related to the ultrabasic belts of northern Vermont.

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Dump fragments from the main shaft indicate that this working was sunk in part through another, very much smaller body of greenstone. Exposures of this greenstone were not observed.

The copper mineralization consists of small, irregular stringers and disseminations of chalcopyrite within the highly crinkled beds (or bed) of sericite phyllite. The chalcopyrite is unusually light in color and resembles pyrite; it is readily scratched by a knife, however, and blowpipe tests show the presence of copper.[3/] The stringers range

3/ Jacobs, E.C., Op. cit.

in thickness from zero to about one half inch. Over a 5-foot width there are in some places as many as a dozen such stringers, separated by barren or sparsely disseminated rock. The 'Bornite', referred to above,[4/] appears to be absent. In places, the chalcopyrite carries a

4/ Jacobs, E.C., Op. cit.

tarnish resembling bornite, but this is readily removed with a knife. Some bornite may, however, be present.

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Some of the dump fragments contain small stringers, about a quarter of an inch thick, of a black, metallic mineral which may have been confused with bornite. Closed-tube tests show that this mineral is not a sulfide; it may be ilmenite. A similar oxide occurs in pink to white quartz veins, one to three inches thick, within the open cut.

The mineralized zone (or zones) probably pitches parallel to the axes of the crinkles in the highly deformed beds (or bed) of sericite phyllite; that is 25-30°, N 10-30° E.

Inspection of the workings shows that the analysis of 1.42 percent copper mentioned by Jacobs almost certainly represents a highly selected specimen. It is estimated that an average sample, taken across a width of 5 or 6 feet, would probably assay nearer 0.1 to 0.2 percent copper.

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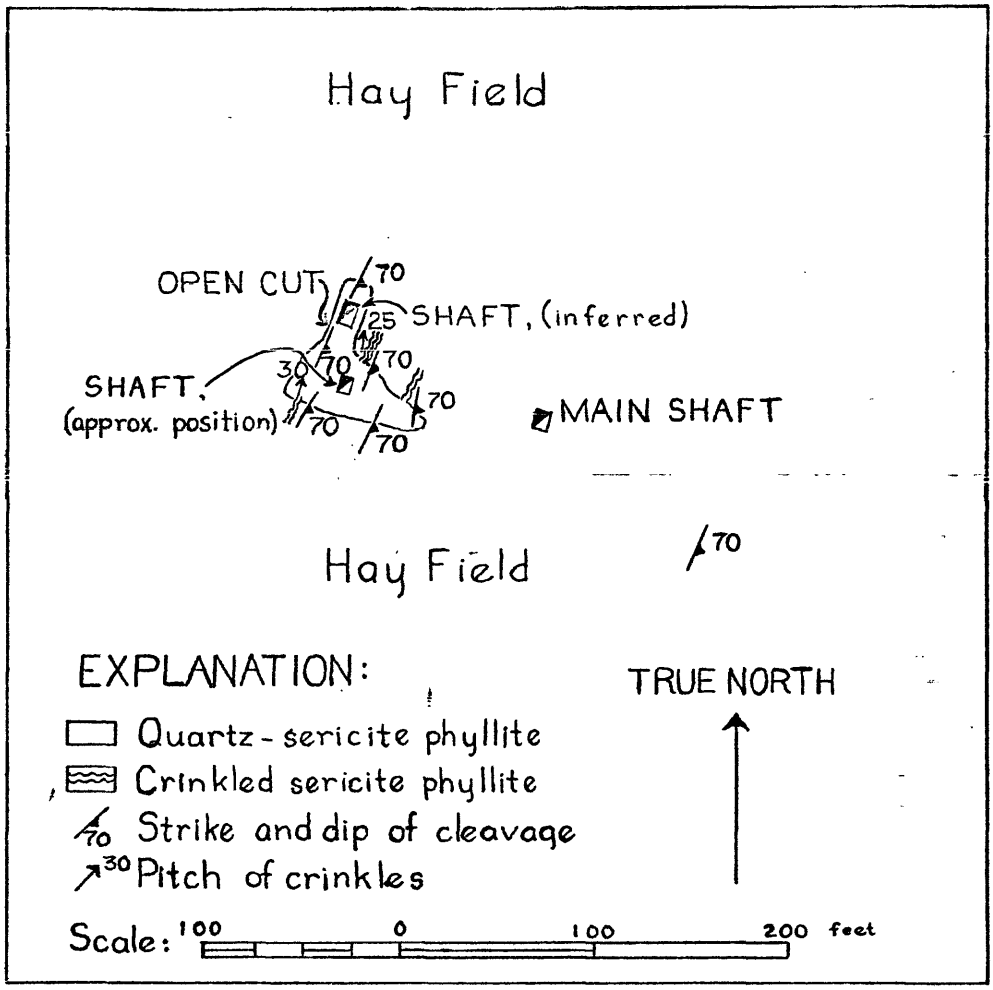
PRELIMINARY MAP
PLATE I



Geology by J.H.Eric

GEOLOGIC MAP OF BERKSHIRE MINE
BERKSHIRE, VERMONT