NOTES AND NEWS

BRANNERITE FROM ONTARIO, CANADA

E. W. NUFFIELD, *University of Toronto, Toronto, Canada*

The Blind River area, situated on the north shore of Lake Huron about 80 miles east of Sault Ste. Marie, was last year the scene of a modern staking rush following the discovery of economically-significant amounts of uranium in Long township. The original find was at one time prospected for gold. It was re-staked in 1948 as a radioactive discovery but the claims were allowed to lapse. Finally it was again staked in 1951 and in 1953, a new company, Pronto Uranium Mines, was formed to take over and explore the property.

The rocks in the area are all Precambrian in age. Unconformably overlying the Basement Group, is the sedimentary group of the Huronian Series of which a quartz-pebble conglomerate at or near the base, contains the interesting radioactive minerals. This conglomerate outcrops intermittently in the form of an inverted S, measuring about 20 miles from north to south and 30 miles from east to west. The rocks on the lower limb dip toward Lake Huron which is about a mile to the south, while those on the middle and upper limbs dip toward each other. Thus the sediments are regionally folded about an east-west axis and plunge to the west.

Most of the prospecting and diamond drilling in the area has up to the present been concentrated in Long township on the lower limb (Pronto Uranium Mines) and west of Quirke Lake in township 150 on the upper limb (Algom Uranium Mines). The two regions have furnished the majority of specimens for mineralogical studies.

The conglomerate bed varies in thickness, but on the Pronto property averages $8\frac{1}{2}$ feet. It has been traced for 4000 feet along strike and an average of 1400 feet down the dip by diamond drilling. It grades locally into an arkosic sandstone or quartzite and into an arkose. The typical conglomerate consists of well-rounded quartz pebbles, up to 2 inches in diameter, in a pyrite-sericite matrix. The pyrite occurs as crystals and in massive form. It is randomly distributed throughout the matrix but also occurs concentrated in zones, sometimes around quartz pebbles. Rarely it fills tiny fractures in the pebbles. The sericite is generally too fine grained for satisfactory optical study. Occasional clusters of muscovite have been developed throughout it.

Studies of the radioactivity by means of autoradiographs of polished

rock slabs and thin and polished sections indicate that in the typical conglomerate it is generally confined to individual grains randomly distributed throughout the matrix or as concentrations of grains, rather than as veins. The presence of radioactivity is dependent upon the presence of pyrite although the intensity of radioactivity is not related to the amount of pyrite. Some sections suggest a segregation of radioactivity to the sides of pyrite zones.

The deposits are so extensive that it will be some time before a detailed description of the mineralogy can be given. However it appears certain at this time that brannerite is responsible for much if not most of the radioactivity. It is interesting to note that this mineral, which until recently was known only from Idaho, has been discovered in at least five other widely separated areas in the world (Pabst, 1954). In the Blind River area it occurs as reddish-brown grains of near-microscopic size, more or less altered to a dense white to yellowish white radioactive product. The mineral is metamict and before ignition often gives the *x*-ray powder pattern of either rutile or anatase. After a momentary ignition at red heat, a pattern identical with the pattern of ignited brannerite from Idaho is obtained.

A semi-quantitative spectrographic analysis performed by the Ontario Department of Mines gave the following results from a specimen of typical matrix material: Y 0.1 to 1.0%, Ce 0.05 to 0.5, Yb trace, La trace, U 0.1 to 1.0, Th trace, Ti 1.0 to 10, Cb trace, Ta none. It may be concluded from this that the metamict minerals common to Ontario which contain appreciable amounts of Cb and/or Ta, are not important here.

Two sections of diamond drill core from different holes showed tiny veinlets of a black mineral. Uncrushed fragments of this material gave the typical UO_2 pattern with smooth arcs. This may therefore be described as pitchblende. Veined pitchblende may be quite rare in the conglomerate. Individual grains which had not been crushed, also gave the pitchblende pattern with smooth arcs. Recently R. J. Traill[1] of the Geological Survey of Canada, identified as uraninite, crystals in conglomerate from the area, which gave a UO_2 powder pattern but with interrupted arcs. It appears therefore that both finely-crystalline and coarsely-crystalline UO_2 is present.

Several specimens of a lustrous black radioactive substance without crystal form were obtained at or near the surface. One specimen consists of irregular masses intimately associated with pyrite, covering almost a

[1] Oral communication at the Prospectors and Developers meeting in March, 1954 at Toronto.

square inch of surface. This burns to a white ash in an open crucible over a Bunsen burner. It is identical with the material which has been described as thucholite but which has been shown by Davidson & Bowie (1951) to be a mixture of hydrocarbons enclosing pitchblende or uraninite.

In addition to these minerals, monazite, zircon, galena and chalcopyrite have been identified.

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A MAGNESIUM BORATE FROM ISÈRE, FRANCE, AND SWIFT RIVER, YUKON TERRITORY, WITH *X*-RAY POWDER DATA FOR SOME ANHYDROUS BORATES

R. M. THOMPSON AND J. A. GOWER, *University of British Columbia, Vancouver, Canada.*

During a study of the minor element content of sphalerite (Warren & Thompson, *Ec. Geol.*, **40**, 318, 1945) the relatively high (0.15 per cent) tin content of marmatite from the St. Christoph Mine, Isère, France, was noted, This sample is a compact crystalline aggregate showing an adamantine lustre and an almost jet black color. On a sawn surface, the sphalerite groundmass shows many small ill-defined greenish-white prismatic crystals of diopside, and small (2 mm.) irregular areas of an unknown, fairly hard, black, finely fibrous mineral.

In polished section, the sphalerite shows exsolved chalcopyrite and a lesser amount of stannite in the form of minute dots and blebs. The unknown fibrous mineral is distinctly pleochroic in dull gray to light blue gray, and highly anisotropic in light orange, blue, and fiery red. In places it is intergrown with diopside. The hardness was estimated as E and the mineral is negative to all etch-reactions.

Thin sections show coarse masses of sphalerite intergrown with diopside, chlorite, and small areas of the black fibrous opaque mineral. The fibrous mineral also occurs as capillary divergent bursts, or as unoriented needles in diopside or chlorite.

In 1945 an *x*-ray powder photograph was taken at the University of Toronto, but as the mineral could not be identified, no further work